



Estell Manor School District

Mathematics Curriculum Grade K

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1 Counting and Cardinality	Approximately 35 Days
Unit 2 Operations and Algebraic Thinking	Approximately 35 Days
Unit 3 Number and Operations in Base Ten	Approximately 35 Days
Unit 4 Measurement and Data	Approximately 35 Days
Unit 5 Geometry	Approximately 35 Days

Core Materials:

GoMath

Do The Math

Linkit

Grade K Overview

Counting and Cardinality

- Know number names and the count sequence

- Count to tell the number of objects
- Compare numbers

Operations and Algebraic Thinking

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Number and Operations in Base Ten

- Work with numbers 11-19 to gain foundations for place value.

Measurement and Data

- Describe and compare measurable attributes.
- Classify objects and count the number of objects in categories.

Geometry

- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 4 will address the following 21st Century Life and Careers skills:			
Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Counting and Cardinality		Duration: September -October
Standards		
K.CC.1	1. Count to 100 by ones and by tens.	
K.CC.2	2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	
K.CC.3	3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	
K.CC.4	4. Understand the relationship between numbers and quantities; connect counting to cardinality. <ul style="list-style-type: none"> a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. c. Understand that each successive number name refers to a quantity that is one larger. 	
K.CC.5	5. Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.	

K.CC.6	6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
K.CC.7	7. Compare two numbers between 1 and 10 presented as written numerals.
Interdisciplinary Skills	
SL.K.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).
SL.K.1.B	Continue a conversation through multiple exchanges.
Technology	
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
21st Century Life and Career	
CRP4.	Communicate clearly and effectively and with reason
Essential Understandings	
<i>Students will understand that...</i>	
<ul style="list-style-type: none"> Counting is used constantly in everyday life; i.e. counting toys or people on a team Numerals are used to represent quantities People used numbers to communicate with others; i.e. two more forks are needed for the dinner table 	
Essential Questions	
<ul style="list-style-type: none"> Why do we count things? Is there a wrong way to count? Why? How do you know when you have more or less? 	
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	
Other Assessments	
Make a Counting Book - Students will sequence and represent numbers 1-20	
Formative Assessments	
<ul style="list-style-type: none"> Games Anecdotal Records Oral Assessments/Conferencing 	

<ul style="list-style-type: none"> • Students will create a book for numbers 1-20, representing each number in multiple ways (sets of objects, number word, digits, etc.) • Students can use magazine pictures, colored pencils, stickers, markers, etc. 	<ul style="list-style-type: none"> • Portfolio/Math Journals • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Linkit Skills assessment <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment • Linkit assessment A <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Know number names and the count sequence Ch. 1,2,3,4,7,8 • Count to tell the number of objects - Ch. 1,2,3,4 • Compare numbers - Ch. 2,4 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Count orally to 100 (by ones and tens) • Count and represent objects up to 20 • Write numerals from 0 to 20

Students will know... <ul style="list-style-type: none">• Number names and the count sequence• Numbers are used to count and order objects• Numerals are represented by written symbols• Numbers represent a quantity that can be compared	<ul style="list-style-type: none">• Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
“War” card game - Students will turn over top card and compare numbers for greater/less than.	Deck of number cards	Expand (Gifted and Talented) or reduce (Basic Skills/Economically Disadvantaged) the numbers on the cards. Use cards with pictures (ELL)
Chutes and Ladders - One-to-one correspondence, student will be counting and moving toward an end goal	Chutes and Ladders game	Spin twice and find the sum (Gifted and Talented) play with two pairs or students (Basic Skills/ELL/Economically Disadvantaged)

Marshmallow Counting - Students will drop the correct number of mini marshmallows into each cup that is labeled with a number.	Cups and mini marshmallows	Expand (Gifted and Talented) or reduce (Basic Skills/Economically Disadvantaged) the numbers on the cups (2-digit numbers); count numbers aloud (ELL)
Number Match Memory - Students will match number cards with sticker set cards in a memory game.	Number cards and sticker set cards (teacher made)	Use 1 digit (Basic Skills/Economically Disadvantaged) or 2 digit numbers (Gifted and Talented); name numbers (ELL)
Number Bingo - Students will use whole numbers or sets.	blank bingo grids	Use 3x3 (Basic Skills/Economically Disadvantaged) or 5x5 (Gifted and Talented) bingo cards, vary the number sets
Bus Stop - Students will roll numbers 1-5 in order to move through the board.	Ch. 1 student workbook - game sheet, dice, game pieces	Play in reverse order, counting back from 5 (Gifted and Talented), partner help (Basic Skills/Economically Disadvantaged)

Counting to Blast Off - Students will roll and cover each number.	Ch. 2 student workbook - game sheet, dice, counters to cover spaces	Cover the numbers lowest to highest (Basic skills/Economically Disadvantaged) or add higher number cards (Gifted and Talented)
Number Line Up - Students will order number cards 0-5 up and down until a player runs out of cards.	Ch. 3 student workbook - game sheet, 2 sets of number cards 0-5	Expand (Gifted and Talented) /reduce (Basic Skills/Economically Disadvantaged) the numbers on the cards
Spin and Count - one-to-one correspondence.	Ch. 4 student workbook- game sheet, pencil, paperclip, game pieces	Expand (Gifted and Talented) /reduce (Basic Skills/Economically Disadvantaged) the numbers
Math Literature		
Grab and Go Math Readers <ul style="list-style-type: none"> ● <i>Pancakes for All</i> ● <i>The Red Caboose</i> ● <i>Mabel's Place</i> ● <i>A Nutty Story</i> ● <i>I Know Numbers</i> ● <i>Raccoons' Playtime</i> Literature		

<ul style="list-style-type: none"> • <i>Ten Black Dots</i> by Donald Crews • <i>Fish Eyes</i> by Lois Ehlert • <i>Anno's Counting Book</i> by Anno Mitsumasa • <i>Chicka, Chicka, 1, 2, 3</i> by Bill Martin • <i>Miss Bindergarten Celebrates the 100th Day of Kindergarten</i> by Joseph Slate 	
Websites	
www.more.starfall.com	Provides opportunities for practice with identifying numbers, counting, addition and subtraction.
http://www.drjean.org/	Songs and fingerplays relating to various math concepts.
http://www.funbrain.com/	Games: Bunny Count One False Move
http://www.primaryonline.co.uk/sitetour/pol/findra.html	Order numbers 1 through 10.
http://www.mathwire.com/	Provides a plethora of resources for teachers including printable games and online games.
http://www.jumpstart.com/	Students count, add, subtract, make equations, make patterns, sort objects and solve problems.
http://www.abcya.com/kindergarten_computers.htm#numbers-cat	Games: Counting Fish, Counting to 100, More or Less, Numerical Order
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed 	

- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Gifted and Talented

- GoMath Real World Videos
- GoMath Stem Activities
- GoMath Enrich Activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling
- Vary activities by choice

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Unit 2: Operations and Algebraic Thinking		Duration: November-December
Standards		
A.	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	
K.OA.1	1. Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations	
K.OA.2	2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	
K.OA.3	3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).	
K.OA.4	4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	
K.OA.5	5. Demonstrate fluency for addition and subtraction within 5.	
	Interdisciplinary Skills	
SL.K.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).	
SL.K.1.B	Continue a conversation through multiple exchanges.	
	Technology	

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Career
CRP4.	Communicate clearly and effectively and with reason.
Essential Understandings	Essential Questions
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • People combine quantities to find a total (i.e., number of boys and girls in the classroom) • People use subtraction to find out what is left over (i.e., number of toys left after giving some away) 	<ul style="list-style-type: none"> • What happens when two quantities are combined? • What happens when a set of objects is separated into different sets?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p><u>Let's Plant a Garden</u> - Add/Subtract with numbers to 5.</p> <ul style="list-style-type: none"> • Students will be told they are going to plant a pretend garden. • Students will be given a worksheet with 6 different packages of seeds displayed. • Students will then be asked to choose two items they would like to plant in their pretend garden and circle the packets. • Students will draw the number of seeds (1-5) of each item they are going to plant in their garden. • Students will plot seeds into the "ten frame" garden. 	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals • Daily Classwork • Pre-assessments <p>Summative Assessments</p>

<ul style="list-style-type: none"> Students will then add the total number of seeds planted. <p>Modification - increase seeds 6-10 seeds per item.</p>	<ul style="list-style-type: none"> Tests Assessment book Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills:
<p>Cluster</p> <ul style="list-style-type: none"> Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from -Ch. 5,6 <p>Students will know...</p> <ul style="list-style-type: none"> That addition is putting together and adding to That subtraction is taking apart and taking from 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> Represent addition and subtraction in a variety of ways Solve addition and subtraction word problems Add and subtract within 10 using manipulatives or drawings Decompose numbers less than and equal to 10 in more than one way

	<ul style="list-style-type: none">• Find complements of 10 (i.e., 1+9, 2+8, 3+7, 4+6, 5+5)• Use mental math strategies to solve addition and subtraction facts within 5	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
Addition and Subtraction War - Students will turn over two cards, find the sum, and compare. Or subtract the numbers to find the difference.	Number cards	Expand (Gifted and Talented) /reduce (Basic Skills/Economically Disadvantaged) the numbers on the cards. Provide cards with pictures matching the numbers (ELL)
Domino Addition and Subtraction - Students will use domino dots to add and subtract numbers.	dominoes	Regulate the dominoes used (high for Gifted and Talented vs low numbers for Basic Skills/Economically Disadvantaged) Match domino with coordinating number (ELL)
Pairs that Make 7 - Students will roll two dice to find all the number pairs for 7.	Ch. 6 student workbook - game sheets	Find pairs for various numbers higher (Gifted and Talented) and lower

		(Basic Skills/Economically Disadvantaged)
Spin for More - Students will spin both spinners to add the numbers. Players compare their totals.	Ch. 7 student workbook - game sheet, paper clip, pencil	Spin the lower numbered spinner twice to add smaller numbers (Basic Skills/Economically Disadvantaged); or the higher numbered spinner twice for higher sums (Gifted and Talented) Spin the spinner and say the number it lands on. (ELL)
Math Literature		
Grab and Go Math Readers <ul style="list-style-type: none"> • <i>Pancakes for All</i> • <i>Flowers for Flossie</i> • <i>Numbers at the Lake</i> • <i>Under the Umbrellas</i> Literature <ul style="list-style-type: none"> • <i>This Old Man</i> by Pam Adams • <i>Remainder of One</i> by Elinor J. Pinczes • <i>Domino Addition</i> by Lynette Long 		
Websites		
http://www.bbc.co.uk/schools/laac/numbers/ch1.shtml	Provides addition and subtraction practice with open number sentences.	

http://more.starfall.com/	Provides opportunities for practice with identifying numbers, counting, addition and subtraction.
http://www.abcya.com/kindergarten_computers.htm#numbers-cat	Games: Add and Subtract within 10, Add to 10, Addition with Manipulatives, Sum of all Dice
http://www.mathwire.com/	Provides a plethora of resources for teachers including printable games and online games.
http://www.brainpopjr.com/math/	Access several movie clips relating to every math standard.
http://www.jumpstart.com/	Students count, add, subtract, make equations, make patterns, sort objects and solve problems.
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented	
<ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities 	
English Language Learners	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed 	

- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Unit 3: Number and Operations in Base Ten		Duration: January -February
Standards		
A.	Work with numbers 11–19 to gain foundations for place value.	
K.NBT.1	1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	
	Interdisciplinary skills	

SL.K.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).	
SL.K.1.B	Continue a conversation through multiple exchanges.	
	Technology	
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).	
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.	
	21st century Life and Career	
CRP4.	Communicate clearly and effectively and with reason.	
Essential Understandings <i>Students will understand that...</i>		Essential Questions
<ul style="list-style-type: none"> Numbers can be represented in a variety of ways Numbers greater than 9 (11-19) are grouped into a ten and one(s) 		<ul style="list-style-type: none"> How can you represent the number 11? 12? 13? 14? 15? 16? 17? 18? 19? Why do we group numbers into tens and ones?
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments
<u>Ten Frame Puzzles</u> <ul style="list-style-type: none"> Students will match 3 piece puzzles showing a teen number, the number broken down into tens and ones, and the number shown in base ten frames. Modification - students can use blank templates to make their own puzzles.		Formative Assessments <ul style="list-style-type: none"> Teacher Observation Performance Assessments Exit Slips Games Anecdotal Records Oral Assessments and Conferencing Portfolio/Math Journals Daily Classwork Pre-assessments

	<p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Assessment book <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Work with numbers 11-19 to gain foundations for place value - Ch. 7,8 	<p><i>Students will be able to ...</i></p>

<i>Students will know...</i> <ul style="list-style-type: none">• The foundation of the base-ten system	<ul style="list-style-type: none">• Compose and decompose numbers from 11 to 19 into a group of ten and ones) with or without manipulatives• Record each composition or decomposition through a drawing or equation	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
Pom-pom Tens Frames - Students will represent teen numbers using pom-poms in two “ten frames”	Tens frames, pom-poms, number cards	Expand (Gifted and Talented) /reduce (Basic Skills/Economically Disadvantaged) the numbers on the cards
Integrate standards through morning meeting and calendar routines as applicable.	Number grid	Count and compare numbers with grid and orally
Students will play, “War” card game with ten frames and dot cards	Ten frame cards to use for comparing number sets from 11-19	Expand (Gifted and Talented) /reduce (Basic Skills/Economically Disadvantaged) the numbers; reinforce basic comparing words and numbers (ELL)

Sweet and Sour Path - Students will roll and move spaces; go forward for strawberries and backward for lemons.	Ch. 7 student workbook, dice, game pieces	Expand the game board to include a longer path (Gifted and Talented), reduce numbers on game path (Basic Skills/Economically Disadvantaged)
Who Has More? - Students will compare number cards by building cube trains.	Ch. 8 student workbook; number cards, connecting cubes	Omit the use of cube trains (Gifted and Talented); reduce the numbers in the deck (Basic Skills/Economically Disadvantaged) Pick the picture card with the greater number of pictures. (ELL)
Math Literature		
Grab and Go Math Readers <ul style="list-style-type: none"> • <i>Stop the Picnic!</i> • <i>Summertime Math</i> • <i>Where's the Party</i> • <i>Counting at the Market</i> Literature <ul style="list-style-type: none"> • <i>12 Ways to Get to 11</i> by Eve Merriam 		
Websites		

http://more.starfall.com/	Provides opportunities for practice with identifying numbers, counting, addition and subtraction.
http://www.funbrain.com/	Games: Bunny Count One False Move
http://www.mathwire.com/	Provides a plethora of resources for teachers including printable games and online games.
http://www.abcya.com/kindergarten_computers.htm#numbers-cat	Games: Base 10 Bingo, Base 10 Fun, Base 10 Blocks, Comparing Number Values
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities 	
English Language Learners <ul style="list-style-type: none"> • Teacher modeling 	

- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Modifications/Accommodations

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Unit 4: Measurement and Data		Duration: March-April
Standards		
K.MD.1	1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	
K.MD.2	2. Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	
K.MD.3	3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.3	

	Interdisciplinary Skills	
SL.K.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).	
SL.K.1.B	Continue a conversation through multiple exchanges.	
	Technology	
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).	
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.	
	21st Century Life and Career	
CRP4.	Communicate clearly and effectively and with reason.	
Essential Understandings		Essential Questions
<i>Students will understand that...</i> <ul style="list-style-type: none"> • Measurement helps to understand the world such as in cooking, playing and pretending • People compare objects to communicate and collaborate with others (i.e., the heavy book or the long dress) • Objects can be classified into different categories based on common attributes 		<ul style="list-style-type: none"> • How can you tell when one day is bigger than another? • How is height different from length? • How can we classify objects?
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments
<u>Measurement Hunt</u> - compare lengths and weights of various objects <ul style="list-style-type: none"> • Students will trace their shoe on paper. • Students will then make a cube train as long as their shoe. 		Formative Assessments <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games

<ul style="list-style-type: none"> • Students will then take the cube train around the room and hunt for objects that are shorter and longer than their shoe. • After students find objects, they build a cube train about the same size as each object. • Students will draw the objects and write how many cubes long each object was. <p>Modification - compare weights of objects to the weight of their shoe.</p>	<ul style="list-style-type: none"> • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Assessment book <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
Cluster:	<i>Students will be able to ...</i>

<ul style="list-style-type: none">• Describe and compare measurable attributes - Ch. 11,12• Classify objects and count the number of objects in each category - Ch. 12 <p>Students will know...</p> <ul style="list-style-type: none">• Objects have measurable attributes that can be compared• Objects can be classified and counted based on common attributes	<ul style="list-style-type: none">• Identify and describe common measurable attributes• Describe several measurable attributes of a single object• Directly compare two objects with a common measurable attribute• Classify, count and sort objects into categories	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
Marshmallow Measuring - Students will use mini marshmallows to see how many it takes to “measure” everyday classroom items.	Mini marshmallows, classroom items, paper to draw and label items measured	Use regular size marshmallows or various other units of measurement (Gifted and Talented); work with a partner (Basic Skills/ELL/Economical ly Disadvantaged)
Pan Balance Weights - Students will use a pan balance to compare weights of various classroom items (erasers, beans, counters, etc.).	Pan balance and items to weigh	Make a sheet of items to compare and document (Gifted and Talented); work with a partner (Basic

		Skills/Economically Disadvantaged)
Sorting Shapes - Students will sort by color, shape, or size.	Shape manipulatives	Sort by various attributes; “guess my attribute” (one sorts, one guesses) (Gifted and Talented) Sort by color using color poster as a guide (ELL and Basic Skills/Economically Disadvantaged)
Students will create class tally charts and graphs about various topics, such as favorite animal, number of siblings, etc. Discuss data.	Chart paper or class white board	Teacher administered (Basic Skills/Economically Disadvantaged) vs student- administered (Gifted and Talented) surveys; work with a partner (ELL)
Connecting Cube Challenge game - Students will roll dice, move spaces, collect cubes for your train; compare train lengths when finished.	Ch. 11 student workbook - game sheet, game pieces, connecting cubes	Replace cubes with numbers to build longer trains(Gifted and Talented)/shorter trains (Basic Skills/Economically

		Disadvantaged); count aloud and model (ELL)
At the Farm game - Students will work with a partner to play "I Spy" and sort by color.	Ch. 12 student workbook - game sheet	Play using the classroom setting (Basic Skills/Economically Disadvantaged); describe using various attributes (Gifted and Talented), Use color poster as a guide (ELL)
Math Literature		
<p>Grab and Go Math Readers</p> <ul style="list-style-type: none"> • <i>Who Am I?</i> • <i>Curious George and the Mystery Boxes</i> • <i>Shells! Shells!</i> • <i>Hippo and Fox Sort Socks</i> <p>Literature</p> <ul style="list-style-type: none"> • <i>Ten Beads Tall</i> by Pam Adams • <i>How Big Is a Foot?</i> by Myller Rolf • <i>Is it larger? Is it Smaller?</i> by Tana Hoban • <i>Inch by Inch</i> by Leo Lionni • <i>The Grouchy Ladybug</i> by Eric Carle • <i>Measuring Penny</i> by Loreen Leedy • <i>The Button Box</i> by Margarett Reid 		

Websites	
http://www.abcya.com/kindergarten_computers.htm#numbers-cat	Various games
https://www.education.com/game/circus-measurement/	Circus measuring game
https://www.education.com/resources/game+skill-builder/kindergarten/data/	Various Sorting games
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented	
<ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities 	
English Language Learners	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Unit 5: Geometry		Duration: May- June
Standards		
K.G.1	1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to	
K.G.2	2. Correctly name shapes regardless of their orientations or overall size.	
K.G.3	3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).	
K.G.4	4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).	

K.G.5	5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
K.G.6	6. Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”
	Interdisciplinary Skills
SL.K.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care and taking turns speaking about the topics and texts under discussion).
SL.K.1.B	Continue a conversation through multiple exchanges.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Career
CRP4.	Communicate clearly and effectively and with reason.
Essential Understandings	
Essential Questions	
<i>Students will understand that...</i> <ul style="list-style-type: none"> Shapes help people to describe the world. People communicate where things are by their location in space using words like next to, below, and in between 	<ul style="list-style-type: none"> Where can we find shapes in our world? What are the ways to describe where an object is? How are shapes alike and how are they different? Can you use shapes to create a new shape?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments

Shape Search - identify, name and describe two and three dimensional shapes

- Students will find examples of two dimensional shapes in the classroom.
- Teacher will review numbers of side and vertices of various shapes with the class.
- Students will then be given a picture of a scene and identify the shapes by color coding them.
- Students will then search for real world three dimensional shapes and will draw an example of each.

Modification - Draw three dimensional shapes in relation to each other using positional words.

Formative Assessments

- Teacher Observation
- Performance Assessments
- Exit Slips
- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Portfolio/Math Journals
- Daily Classwork
- Pre-assessments

Summative Assessments

- Tests
- Assessment book
- EOY Benchmark

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess
- Modified Classwork Assignments
- Modified Benchmarks
- GoMath Reteach Activities and Worksheets
- Project Based Assessments with Scoring Rubric

Knowledge and Skills		
Content	Skills:	
Cluster: <ul style="list-style-type: none">Identify and describe shapes (squares, circles, triangles, hexagons, cubes, cones, cylinders, and spheres) - Ch. 9,10Analyze, compare, create, and compose shapes - Ch. 9,10 Students will know... <ul style="list-style-type: none">All objects have shapeShapes have specific attributesShapes can be analyzed, compared and created	<i>Students will be able to ...</i> <ul style="list-style-type: none">Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)Describe shapes using position termsCorrectly name shapes regardless of orientation and sizeIdentify two and three dimensional shapesAnalyze and compare two and three dimensional shapesConstruct and draw shapes using a variety of materialsCompose simple shapes to form larger shapes	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
Body Shapes - Students will make shapes on the rug using their bodies as the sides of the shapes - work together to decide how to make each shape	none	Draw and label shapes made (Gifted and Talented); assist groups as needed (Basic Skills/Economically Disadvantaged); reinforce

		shape names and numbers of sides (ELL)
Pattern Blocks - Students will use pattern blocks to model and create pictures.	Pattern blocks, picture cards (optional)	Create own pictures (Gifted and Talented) shape patterns from cards (Basic Skills/Economically Disadvantaged) Use colored pattern shape cards (ELL)
Pattern Blocks - Students will use pattern blocks to practice joining shapes to make other shapes.	Pattern blocks, paper	Draw designs of shapes created; take apart shapes (Gifted and Talented); Trace dotted joined shapes (Basic Skills/Economically Disadvantaged); Name each shape as it is traced (ELL)
Geoboards - Students will create shapes by stretching rubber bands across geoboards.	Geoboards and rubber bands	Create a given list of shapes - count sides and vertices (Gifted and Talented); free choice shapes (Basic Skills/Economically Disadvantaged) Use pictures to show shapes ; name shapes (ELL)
Number Picture Game - Students will roll dice, color corresponding shape.	Ch. 9 student workbook - game sheets, dice, crayons	Replace with higher numbers - roll a sum to color (Gifted and Talented); work with a partner

		(Basic Skills/Economically Disadvantaged) Use one die and count number of dots (ELL)
Shape Game - Students will roll dice, move spaces, name and describe the shape landed on.	Ch. 9 student workbook - game sheet, dice, game pieces	Use vocabulary cards as a reference (Basic Skills/Economically Disadvantaged); try giving two characteristics (Gifted and Talented) Matching shape cards activity (ELL)
Follow the Shapes - Students will trace a path across the game mat to follow the shape chosen.	Ch. 10 student workbook - game sheet, pencil, highlighter	Highlight path (Basic Skills/Economically Disadvantaged); try it in reverse (Gifted and Talented) Color shapes using color code; name colors (ELL)
Math Literature		
<p>Grab and Go Math Readers</p> <ul style="list-style-type: none"> • <i>And the Wheels Go Round</i> • <i>I Know Shapes</i> • <i>I Know Big and Small</i> • <i>Curious George Goes to a Toy Store</i> • <i>Up, Up to the Top</i> <p>Literature</p> <ul style="list-style-type: none"> • <i>The Greedy Triangle</i> by Marilyn Burns • <i>Cubes, Cones, Cylinders and Spheres</i> by Tana Hoban 		

<ul style="list-style-type: none"> • <i>The Shape of Things</i> by Dayle Ann Dodds • <i>Go Away Big Green Monster</i> by Ed Emberley • <i>The M & M's Color Pattern Book</i> by Barbara Barbieri McGrath 	
Websites	
http://www.pbs.org/parents/education/math/games/preschool-kindergarten/	Game: Building Sandcastles
http://www.abcya.com/kindergarten_computers.htm#numbers-cat	Various games
https://www.education.com/game/2d-3d-shapes/	Sort 2d and 3d shapes
https://www.education.com/game/2d-3d-shape-match/	2d and 3d shape match
https://www.education.com/game/shapes-ski-race/	Ski Race shapes
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Stem Activities 	

- GoMath Enrich Activities

English Language Learners

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling



Estell Manor School District

Mathematics Curriculum Grade 1

Statement of Purpose

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1 Operations and Algebraic Thinking	Approximately 40-45 Days
Unit 2 Number and Operations in Base Ten	Approximately 40-45 Days
Unit 3 Measurement and Data	Approximately 40-45 Days
Unit 4 Geometry	Approximately 40-45 Days

Core Materials:

GoMath
Do The Math
Linkit

Grade 1 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 20
- Work with addition and subtraction

Number and Operations in Base Ten

- Extend the counting sequence
- Understand place value
- Use place value understanding and properties of operations to add and subtract

Measurement and Data

- Measure lengths indirectly and by iterating length units
- Tell and write time
- Represent and interpret data

Geometry

- Reason with shapes and their attributes

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy			CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers			CRP2. Apply appropriate academic and technical skills.
X	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Operations and Algebraic Thinking	Duration: September – November
NJ Student Learning Standard 1.OA	
Unit Summary <ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction • Understand and apply properties of operations and the relationship between addition and subtraction • Add and subtract within 20 • Work with addition and subtraction equations 	

NJ Student Learning Standard: 1.OA	
A.	Represent and solve problems involving addition and subtraction.
1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
B.	Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.3	Apply properties of operations as strategies to add and subtract.3 Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.) {Students need not use formal terms for these properties}
1.OA.4	Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.
C.	Add and subtract within 20.
1.OA.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
1.OA.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
D.	Work with addition and subtraction equations.
1.OA.7	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.
1.OA.8	Determine the unknown whole number in an addition or subtraction equation relating 3 whole numbers. For example, determine the unknown number that makes the equation true in each of the following equations $8 + ? = 11$, $5 = ? - 3$, $6 + 6 = ?$
Number	NJ Student Learning Standard for Introduction
2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members by pairing objects or counting them by 2's; write an equation to express an even number as a sum of 2 equal addends.
	8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. A. Technology Operations and Concepts: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.

	<p>9.1 21st Century Life Skills: All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures.</p> <p>B. Creativity and Innovation: Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.</p>
	Interdisciplinary Connections
SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Career
CRP4.	Communicate clearly and effectively and with reason.
<div>Essential Understandings</div> <div>Essential Questions</div>	
<div> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> Addition and subtraction are used to model real-world situations such as computing saving or spending, finding the number of days until a special day or determining an amount needed to earn a reward Fluency with addition and subtraction facts helps to quickly find answers to important questions </div> <div> <ul style="list-style-type: none"> What is addition and how is it used? What is subtraction and how is it used? How are addition and subtraction related? </div>	

Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p>“Spelling” Addition and Subtraction: Students spell the word of the day using scrabble letter tiles with numbers to add and subtract.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Daily Classwork • Exit Slips • Games • Oral Assessments/Conferencing <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Quizzes • Benchmark Assessment • GoMath Benchmark Assessment • Linkit Assessment A <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments

	<ul style="list-style-type: none"> • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Unit Content	Unit Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction-<i>Chapters 1,2,3,4,5,8</i> • Understand and apply properties of operations and the relationship between addition and subtraction-<i>Chapters 1,2,3,4,5,8</i> • Add and subtract within 20-<i>Chapters 1,2,3,4,5,8</i> • Work with addition and subtraction equations-<i>Chapters 1,2,3,4,5,8</i> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • To use addition and subtraction to take numbers apart and put them back together in order to understand number relationships • To look for and make use of structure • Which strategies to use to problem solve 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction • Understand and apply properties of operations and the relationship between addition and subtraction • Add and subtract within 20 • Work with addition and subtraction equations
Math Literature	

Grab and Go-Math Readers Addition Concepts/Strategies: <ul style="list-style-type: none"> • The Class Party • Math Club • Garden Party • Busy Bugs • Doubles Fun on the Farm • Funny Bunny Hats 	
Subtraction Concepts/Strategies: <ul style="list-style-type: none"> • The Class Party • Milk for Sale • Math Club • Miss Bumble’s Garden • Hershey’s Kisses Subtraction Book 	
Addition and Subtraction Relationships: <ul style="list-style-type: none"> • Picture Puzzles • Juggling • Garden Party • It’s a Home Run • Party Plans 	
Websites	
http://www.ixl.com/?gclid=CJbknti0_qkCFUJn5Qodbx7uxg	Individual game/activities for independent practice

http://coolmath4kids.com/	Individual game/activities for independent practice
http://www.mathwire.com/games/addsubgames.html	Printable games/activities
http://internet4classrooms.com/	Games, power points, instructional aides
http://faculty.usiouxfalls.edu/arpeterson/firstgradesmartboard.htm	Smart Board activities and lessons
http://www.softschools.com/math/games/fishing_sub.jsp	Subtraction fishing game, arcade type games
http://www.brainpopjr.com/	Instructional student videos
http://streaming.discoveryeducation.com/	Student activities, instructional aides
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities 	
English Language Learners	

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers		CRP2. Apply appropriate academic and technical skills.
X	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.

	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: Number and Operations in Base Ten	Duration: December – February, Ongoing
NJ Student Learning Standards: 1.NBT	
Unit Summary <ul style="list-style-type: none"> ● Extend the counting sequence 	

- Understand place value
- Use place value understanding and properties of operations to add and subtract

Primary Interdisciplinary Connections

Science	scientific method, weather patterns, life cycle of plants and animals
Social Studies	calendar, timelines, dates, and events, ethnic and organizational cultures
Language Arts	create math stories
Technology	interactive SmartBoard lessons, independent centers, classroom websites, use digital tools to access, manage, evaluate, and synthesize information

Financial Literacy	Students use place values to understand and make appropriate financial choices.
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NJ Student Learning Standard 1.NBT

A.	Extend and counting sequence
1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
B.	Understand place value
1.NBT.2	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a “ten.” b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.
C.	Use place value understanding and properties of operations to add and subtract.
1.NBT.4	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models (e.g., base ten blocks) or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.NBT.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.NBT.6	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	Interdisciplinary Connections
SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Career and Life Skills
CRP4	Communicate clearly and effectively and with reason.
Essential Understandings	
Essential Questions	
<i>Students will understand that...</i> <ul style="list-style-type: none"> The comparison of numbers helps to communicate and to make sense of the world 	
<ul style="list-style-type: none"> Can numbers always be related to tens? Why was a place value system developed? Why not always count by 1? How does a position of a digit affect its value? 	

	<ul style="list-style-type: none"> • How big is 100?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
Base 10 Pool Noodle Number of the Day: Use long pool noodles (of one color) and cut pool noodles (of another color) to represent tens and ones. Students show the number of the day with pool noodles and write down the number of the day.	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Assessments/Conferencing • Portfolio/Math Journals Daily • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Quizzes • Linkit Skills assessment <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric

Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Extend the counting sequence-<i>Chapters 6, 7</i> • Understand place value-<i>Chapters 6,7</i> • Use place value understanding and properties of operations to add and subtract-<i>Chapters 6, 7</i> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • To visualize and make representations of their ideas • To count and order both real and imaginary objects • Abstract and quantitative reasoning 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Extend the counting sequence • Understand place value • Use place value understanding and properties of operations to add and subtract
Math Literature	
<p>*Grab and Go-Math Readers*</p> <p>Count and Model Numbers:</p> <ul style="list-style-type: none"> • Join Us • Strawberries • Name That Number • Anno's Counting Book-Mitsumasa Anno • The M & M's Counting Book-Barbara Barbieri McGrath 	
Websites	
http://mathplayground.com/	Individual game / activities for independent practice
http://www.havefunteaching.com/	Instructional aides: songs, videos & games

www.newton.k12.ks.us/sch/w/start/1st_grade.htm	Independent interactive computer games
http://www.apples4theteacher.com/greater-than-less-than.html	Interactive computer games for greater than and less than
http://www.brainpopjr.com/	Instructional student videos
http://streaming.discoveryeducation.com/	Student activities, instructional aides
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities • Centers 	
Gifted and Talented	
<ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities • Multi-step problems • Centers 	
English Language Learners	
<ul style="list-style-type: none"> • Teacher modeling 	

- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Unit 3: Measurement and Data	Duration: March – April
NJ Student Learning Standard: 1.MD	
Unit Summary <ul style="list-style-type: none"> • Measure lengths indirectly and by using length units • Tell and write time • Represent and interpret data 	

Primary Interdisciplinary Connections	
Science	Measure, record, and compare data, create tables and graphs to represent data
Social Studies	Survey, record, and compare data, economics
Language Arts	write informational/ explanatory texts in which a topic is named, facts and procedure are provided, and a sense of closure is given
Technology	interactive SmartBoard lessons, independent centers, classroom websites, use digital tools to access, manage, evaluate, and synthesize information

Global Awareness	Students work with word problems containing names and locations around the world to develop understanding of diverse cultures and lifestyles
Communication	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers.

Civic Literacy	Students understand the skills of mapping, gridding, and compass directions.
Economic Literacy	Students understand the role of economics in society and understand how to make appropriate personal economic choices.

NJ Student Learning Standard: 1.MD	
A.	Measure lengths indirectly and by iterating length units.
1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
B.	Tell and write time.
1.MD.3	Tell and write time in hours and half-hours using analog and digital clocks.
C.	Represent and interpret data.
1.MD.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
NJ Student Learning Standard for Introduction	
2.MD.8	Solve word problems involving dollar bills, quarters, dimes, nickels and pennies, using \$ and the cent symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
Interdisciplinary Skills	
SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
Technology	
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.	
	21st Century Life and Career	
CRP4.	Communicate clearly and effectively and with reason.	
Essential Understandings		Essential Questions
<i>Students will understand that...</i> <ul style="list-style-type: none"> • Why do we measure objects and time? • How are length and time different? How are they the same? • What kinds of questions generate data? • What questions can be answered by a data representation? 		<ul style="list-style-type: none"> • Time measurement is a means to organize and structure each day and our lives, and to describe tempo in music • Measurement helps to understand and describe the world such as comparing heights of friends, describing how heavy something is, or how much something holds • People use graphs and charts to communicate information and learn about a class or community, such as favorite ice cream flavors of a class
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments
Paper Chain Measurement: Give different amounts of construction paper to each group to make paper chains. Measure each chain and see what group can make the longest chain.		Formative Assessments <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games • Anecdotal Records • Oral Assessments/Conferencing

	<ul style="list-style-type: none"> • Portfolio/Math Journals Daily • Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Quizzes • GoMath Tests <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
Cluster: <ul style="list-style-type: none"> • Measure lengths indirectly and by iterating length units-<i>Chapter 9</i> 	<i>Students will be able to ...</i> <ul style="list-style-type: none"> • Measure lengths indirectly and by iterating length units

<ul style="list-style-type: none"> • Tell and write time-<i>Chapter 9</i> • Represent and interpret data-<i>Chapter 10</i> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • To use measurable attributes to describe countless objects • To use appropriate tools strategically • To measure accurately • To organize and explain random information 	<ul style="list-style-type: none"> • Tell and write time • Represent and interpret data
Math Literature	
<p><i>*Grab and Go-Math Readers*</i></p> <p>Measurement and Data:</p> <ul style="list-style-type: none"> • Miss B.'s Class Makes Tables and Graphs • Inch by Inch-by Leo Leoni • Time to Play • How Tall How Short • Treasure Hunts • Big Dog Little Dog • The Dog Show 	
Websites	
http://www.funbrain.com/	Independent Interactive measurement activities
http://internet4classrooms.com/	Independent Interactive measurement activities

http://www.apples4theteacher.com/java/telling-time/	Practice with interactive clocks
http://faculty.usiouxfalls.edu/arpeterson/firstgradesmartboard.htm	Interactive smartboard activities
http://www.brainpopjr.com/	Instructional student videos
http://streaming.discoveryeducation.com/	Student activities, instructional aides
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities 	
Gifted and Talented	
<ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities • Centers 	
English Language Learners	
<ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson 	

- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Centers

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Geometry	Duration: May – June
NJ Student Learning Standard: 1.G	
Unit Summary	
<ul style="list-style-type: none"> Reason with shapes and their attributes 	

Primary Interdisciplinary Connections	
Science	identify and sort shapes and their properties, explore shapes of the planets and

	constellations
Social Studies	maps, signs, and symbols, coordinate grids
Language Arts	literacy books, and puzzles
Technology	interactive SmartBoard lessons, independent centers, classroom websites, use digital tools to access, manage, evaluate, and synthesize information

Global Awareness	Students work with word problems containing names and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Civic Literacy	Students understand the skills of mapping, gridding, and compass directions.

NJ Student Learning Standard: 1.G	
A.	Reason with shapes and their attributes.
1.G.1	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
1.G.2	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. ⁴
1.G.3	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
	Interdisciplinary Skills

SL.1.5.	Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st century Life and Career
CRP4.	Communicate clearly and effectively and with reason.
9.2.4.A.2	Identify various life roles and civic and work-related activities in the school, home, and community.
Essential Understandings	
Essential Questions	
<i>Students will understand that...</i> <ul style="list-style-type: none"> Many objects in the world can be described using geometric shapes and relationships Geometry gives us the language to describe these objects 	<ul style="list-style-type: none"> How do you share a whole equally? Why is a cube not a square?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments

Geometric Shape Robots-Use various objects of different geometric shapes to create shape robots. Students will describe, write and share what their robots can do.

Formative Assessments

- Teacher Observation
- Math Journals Daily
- Performance Assessments
- Exit Slips
- Games
- Anecdotal Records
- Oral Assessments, Conferencing
- Classwork
- Pre-assessments

Summative Assessments

- Tests
- Quizzes
- District Wide Assessments
-
- **Benchmark Assessment**
- GoMath Benchmark Assessment
- Linkit Assessment C

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess
- Modified Classwork Assignments

	<ul style="list-style-type: none"> • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
Cluster: <ul style="list-style-type: none"> • Reason with shapes and their attributes, <i>Chapters 11, 12</i> <i>Students will know...</i> <ul style="list-style-type: none"> • To use attributes of shapes to reason 	<i>Students will be able to ...</i> <ul style="list-style-type: none"> • Build and draw two and three-dimensional shapes. • Partition circles and rectangles into halves and fourths
Math Literature	
Grab and Go-Math Readers Geometry <ul style="list-style-type: none"> • April's First Word • Twizzlers Pull n Peel Math-by Jerry Pallotta • Building a Mini Park Signs • The Greedy Triangle-by Marilyn Burns • Shape Up • Not Enough Room-by Joanne Rocklin 	
Websites	

http://www.apples4theteacher.com/math.html#geometry_games	Interactive tangram activities
http://www.okaloosa.k12.fl.us/oakhill/fractions.html	Interactive fraction activities
http://www.theproblemsite.com/junior/color_shape_size.asp	Interactive attribute activities
http://www.learningtoday.com/corporate/default.asp	Interactive 2D activities
http://www.brainpopjr.com/	Instructional student videos
http://streaming.discoveryeducation.com/	Student activities, instructional aides
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities • Centers 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Stem Activities • GoMath Enrich Activities • Centers 	

English Language Learners

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling



Estell Manor School District

Mathematics Curriculum Grade 2

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop “processes and proficiencies” through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1: Operations and Algebraic Thinking	Approximately 40- 45 Days
Unit 2: Number and Operations in Base Ten	Approximately 40- 45 Days
Unit 3: Measurement and Data	Approximately 40- 45 Days
Unit 4: Geometry	Approximately 40- 45 Days

Core Materials:

GoMath
Do The Math
Linkit

Grade 2 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction
- Add and subtract within 20
- Work with equal groups of objects to gain foundations for multiplication

Number and Operations in Base Ten

- Understand place value
- Use place value understanding and properties of operations to add and subtract

Measurement and Data

- Measure and estimate lengths in standard units
- Relate addition and subtraction to length
- Work with time and money
- Represent and interpret data

Geometry

- Reason with shapes and their attributes

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy			CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers			CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Operations and Algebraic Thinking	Duration: September – November, Ongoing
NJ Student Learning Standard: 2.OA	
Unit Summary <ul style="list-style-type: none"> • Represent and solve problems involving addition and subtraction. • Add and subtract within 20. • Work with equal groups of objects to gain foundations for multiplication. <p>Summary: Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.</p>	

Primary Interdisciplinary Connections	
Science	experiments, manipulate data
Social Studies	timeline, dates
Language Arts	open ended questions, math literacy stories related to math concepts
Technology	interactive games/websites and interactive Smartboards

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Financial Literacy	Students will use addition and subtract to make appropriate financial choices.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.

NJ Student Learning Standard: 2.OA	
A.	<i>Represent and solve problems involving addition and subtraction.</i>
2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 1
B.	<i>Add and subtract within 20.</i>
2.OA.2	Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.
C.	<i>Work with equal groups of objects to gain foundations for multiplication.</i>
2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.OA.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
NJ Student Learning Standard for Introduction	
3.OA.1	Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are

	partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
	8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. A. Technology Operations and Concepts: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
	Interdisciplinary Skills
SL.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.
SL.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Careers
CRP4.	Communicate clearly and effectively and with reason
Essential Understandings	
<i>Students will understand that...</i> <ul style="list-style-type: none">• Mathematical expressions represent relationships• The symbolic language of algebra is used to communicate and generalize the patterns in mathematics• The magnitude of numbers affects the outcome of operations on them	
Essential Questions	
<ul style="list-style-type: none">• How is an equation like a balance scale?• How can change be best represented mathematically?• How do operations affect numbers?	

Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p>Create a Classroom Store: Students create a classroom store. They choose what to sell. Set prices. Estimate profit. Organize store space. Decide what items sell. Keep inventory.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Games • Anecdotal Records • Oral Assessments, Conferencing • Portfolio/Math Journals • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Quizzes • BOY Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz

	<ul style="list-style-type: none">• Visual Representation of Skills Assess• Modified Classwork Assignments• Modified Benchmarks• GoMath Reteach Activities and Worksheets• Project Based Assessments with Scoring Rubric	
Knowledge and Skills		
Content	Skills	
<p>Cluster:</p> <ul style="list-style-type: none">• Represent and solve problems involving addition and subtraction: Chapters 2, 3, 4, 5,• Add and subtract within 20: Chapter 3• Work with equal groups of objects to gain foundations for multiplication: Chapters 1, 3 <p><i>Students will know...</i></p> <ul style="list-style-type: none">• Representing and solving problems involves addition and subtraction• Addition and subtraction within 20• Foundations for multiplication by working with equal groups of objects	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none">• Use addition to find the total number of objects• Know from memory all sums of two one-digit numbers• Use arrays or pictures to represent multiplication concepts	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation

Beat the Calculator: One student is the brain the other student is the calculator teacher gives math fact and see who gets the answer first.	Calculator, math fact cards	<p>Addition table</p> <p>Counters (Basic Skills, English Language Learners, Economically Disadvantaged)</p> <p>Higher addition facts (Gifted and Talented)</p>
Dice addition/subtraction: Students will roll the dice and use them to add and subtract.	Dice	<p>Addition table</p> <p>Counters (Basic Skills, English Language Learners, Economically Disadvantaged)</p> <p>Multiple Dice (Gifted and Talented)</p>
Students will play addition / subtraction Bingo.	Bingo cards, chips	<p>Addition table</p> <p>Counters (Basic Skills, English Language Learner, Economically Disadvantaged)</p>
Addition war: Flip two cards and add, player with higher sum wins.	Playing cards	<p>Addition table</p> <p>Counters (Basic Skills, English Language Learners,</p>

		Economically Disadvantaged)
Various learning songs	www.flocabulary.com (addition & subtraction tab)	Print out lyrics (Basic Skills, English Language Learners, Economically Disadvantaged)
Addition Bingo-using a bingo board students put 24 different products on their board. Teacher draws 2 playing cards to create a sum. If students have the sum they mark it on their boards, 1st person to get 5 across/down/or diagonally wins.	Bingo board (or any 5 by 5 graph), Number playing cards, and markers (chips)	Addition table Counters (Basic Skills, English Language Learners, Economically Disadvantaged)
Caterpillar Chase: Basic addition facts to move along game path.	Caterpillar Chase game from Go Math Grab and Go Kit	Addition table Counters (Basic Skills, English Language Learners, Economically Disadvantaged)
On the Ferris Wheel: Basic subtraction facts to move along game board.	On the Ferris Wheel game from Go Math Grab and Go Kit	100s grid Counters (Basic Skills, English Language Learners, Economically Disadvantaged)

Soccer Sums: Adding two digit numbers	Soccer Sums game from Go Math Grab and Go Kit	Addition table Counters (Basic Skills, English Language Learners, Economically Disadvantaged)
Subtraction Action: Making and solving two digit subtraction problems.	Subtraction Action game from Go Math Grab and Go Kit	100s grid Counters (Basic Skills, English Language Learners, Economically Disadvantaged)
What is the Difference?: Practice 2-digit subtraction.	What is the Difference? From Go Math Grab and Go Kit	100s grid Counters (Basic Skills, English Language Learners, Economically Disadvantaged)
Math Literature		
<ul style="list-style-type: none"> • Each Orange Has Eight Slices by Paul Giganti • Elevator Magic by Stuart Murphy • M&M Counting Book by Barbara Barbieri McGrath • Twelve Ways to Get Eleven by Eve Merriam • Rooster's Off to See the World by Eric Carle • Count on Pablo by Barbara DeRubertis and Rebecca McKillip • Thornburgh Anno's Counting House by Mitsumasa • Three Billy Goats Gruff by Ellen Appleby • The Roadside Stand - Math Reader - Tens and Ones 		

- Doubles Fun on the Farm - Math Reader - Doubles
- Game Time - Math Reader - Addition and Subtraction
- Benny, Bessie, and the Blueberries - Math Reader - equal shares
- Comic Books for Sale - Math Reader - 2 digit subtraction
- Party Plans - Math Reader - 2 digit addition and subtraction with regrouping

Websites

www.prodigygame.com

Standard Based Learning Game

www.themathworksheetsite.com

Resource for creating extra practice

Suggested Options for Differentiation

Basic Skills/Economically Disadvantaged

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Centers

Gifted and Talented

- GoMath Real World Videos
- GoMath Stem Activities
- GoMath Enrich Activities
- Centers

English Language Learners

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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Unit 2: Number and Operations in Base Ten	Duration: December – February, ongoing
NJ Student Learning Standard: 2.NBT	
Unit Summary <ul style="list-style-type: none"> • Understand place value • Use place value understanding and properties of operations to add and subtract. <p>Unit Summary: Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.</p>	

Primary Interdisciplinary Connections	
Science	science experiments, manipulate data
Social Studies	timelines, reading and interpreting graphs
Language Arts	open ended questions, math literacy stories, math centers
Technology	interactive games/websites and interactive Smartboards
Global Awareness	Students work with word problems containing names of people and locations around the world.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.

Critical Thinking and Problem Solving	Students use various types of reasoning as appropriate to solve a mathematical problem.
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NJ Student Learning Standard: 2.NBT	
A.	<i>Understand place value.</i>
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.
	<i>B. Use place value understanding and properties of operations to add and subtract.</i>
2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.7	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.NBT.8	Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations. ³
NJ Student Learning Standards for Introduction	
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction

3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 using strategies based on place value and properties of operations.				
Interdisciplinary Skills					
SL.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).				
SL.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.				
SL.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.				
Technology					
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).				
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.				
21st Century Life and Career					
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.				
CRP4.	Communicate clearly and effectively and with reason				
<table border="1"> <thead> <tr> <th>Essential Understandings</th><th>Essential Questions</th></tr> </thead> <tbody> <tr> <td> <i>Students will understand that...</i> <ul style="list-style-type: none"> Place value is based on groups of ten Computation involves taking apart and combining numbers using a variety of approaches Flexible methods of computation involve grouping numbers in strategic ways Two three-digits numbers can be compared based on the meaning of the hundreds, tens and ones digits </td><td> <ul style="list-style-type: none"> How does the position of a digit in a number affect its value? What are efficient ways to count? What are efficient methods of finding sums and differences? How can we compare and contrast numbers? </td></tr> </tbody> </table>		Essential Understandings	Essential Questions	<i>Students will understand that...</i> <ul style="list-style-type: none"> Place value is based on groups of ten Computation involves taking apart and combining numbers using a variety of approaches Flexible methods of computation involve grouping numbers in strategic ways Two three-digits numbers can be compared based on the meaning of the hundreds, tens and ones digits 	<ul style="list-style-type: none"> How does the position of a digit in a number affect its value? What are efficient ways to count? What are efficient methods of finding sums and differences? How can we compare and contrast numbers?
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<i>Students will understand that...</i> <ul style="list-style-type: none"> Place value is based on groups of ten Computation involves taking apart and combining numbers using a variety of approaches Flexible methods of computation involve grouping numbers in strategic ways Two three-digits numbers can be compared based on the meaning of the hundreds, tens and ones digits 	<ul style="list-style-type: none"> How does the position of a digit in a number affect its value? What are efficient ways to count? What are efficient methods of finding sums and differences? How can we compare and contrast numbers? 				

using the <, >, and = symbols to record the results of comparisons.	
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
I Spy Numbers: Place numbers around the halls of the school. Numbers can be changed often. Students spy the numbers and give clues.	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Wipe off boards • Math Journals • Daily Classwork <p>Summative Assessments</p> <ul style="list-style-type: none"> • Quizzes • GoMath Unit Assessments <ul style="list-style-type: none"> • Benchmark Assessment • GoMath Benchmark Assessment • Linkit assessment A <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment

	<ul style="list-style-type: none">● Manipulative Driven Assessment● Modified/Teacher Created Chapter Tests● Modified/Teacher Created Mid-Chapter Quiz● Visual Representation of Skills Assess● Modified Classwork Assignments● Modified Benchmarks● GoMath Reteach Activities and Worksheets● Project Based Assessments with Scoring Rubric	
Knowledge and Skills		
Content	Skills	
Cluster: <ul style="list-style-type: none">● Understand place value: Chapters 1, 2, 3● Use place value understanding and properties of operations to add and subtract: Chapters 4, 5, 6, <i>Students will know...</i> <ul style="list-style-type: none">● Place value and properties of operations to add and subtract	<i>Students will be able to ...</i> <ul style="list-style-type: none">● Read, write, and compare three digit numbers● Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction● Mentally add to 10 or 100 to a given number 100-900 and mentally subtract 10 or 100 from a given number 100-900● Explain why addition and subtraction strategies work, using place value and the properties of operations	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation

Students will make a place value monster.	Paper	<p>Teacher sample (English Language Learners, Economically Disadvantaged)</p> <p>Lower numbers (Basic Skills, Economically Disadvantaged)</p> <p>Higher numbers (Gifted and Talented)</p>
Build a Number: Pick two number out of a bag and show that number with base ten blocks	Base ten blocks	<p>Picture with number (English Language Learners, Economically Disadvantaged)</p> <p>Lower numbers (Basic Skills, Economically Disadvantaged)</p> <p>Higher numbers (Gifted and Talented)</p>
Pictures with base ten: Use copies of base ten blocks to cut and paste and create a picture. Then add the blocks used	Photocopies of base ten blocks	<p>Use only one type of block (Basic Skills, Economically Disadvantaged)</p> <p>Use predetermined number of blocks (Basic Skills,</p>

		<p>Economically Disadvantaged)</p> <p>Use blocks with number written (English Language Learners, Economically Disadvantaged)</p> <p>Use higher numbers (Gifted and Talented)</p>
Number sense game-players draw 3 cards, place the cards in place value order to try to create the largest 3 digit number. Whoever created the largest 3 digit number wins the round.	Number cards	Play the game to a larger (Gifted and Talented) or smaller (Basic Skills, Economically Disadvantaged) place value
Students will sing Place Value Songs.	https://www.education.com/resources/activity+song/second-grade/math/	Have song lyrics available (Basic Skills, English Language Learners, Economically Disadvantaged)
Students will play Place Value Bingo.	Bingo cards, chips	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
Four in a Row: Practice naming numbers in different ways.	Four in a Row game from Go Math Grab and Go kit	

Fishing For Digits: Practice identifying place value of digits.	Fishing for Digits game from Go Math Grab and Go Kit	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
Climb the Steps: Making and comparing numbers	Climb the Steps game from Go Math Grab and Go Kit	
Two Digit Shuffle: Addition using base ten blocks	Two Digit Shuffle game from Go Math Grab and Go Kit	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
Soccer Sums: Adding two digit numbers	Soccer Sums game from Go Math Grab and Go Kit	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
Subtraction Action: Making and solving two digit subtraction problems	Subtraction Action game from Go Math Grab and Go Kit	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
What is the Difference?: Practice 2-digit subtraction	What is the Difference? From Go Math Grab and Go Kit	Use higher value cards (Gifted and Talented) and lower value cards (Basic Skills, Economically Disadvantaged)
Around the World!: 3 digit subtraction	Around the World game from Go Math Grab and Go Kit	

Math Literature

- 26 Letters and 99 Cents by Tana Hoban
- Each Orange Had Eight Slices: A Counting Book by Paul Giganti
- One Hundred Hungry Ants by Eleanor Pinczes
- Two of Everything: A Chinese Folktale by Lily Toy Hong
- Elevator Magic by Stuart J. Murphy
- A Day With No Math by Marilyn Kaye
- The King's Commissioners by Aileen Friedman
- Rooster's Off to see the World by Eric Carle
- Count on Pablo by Barbara deRubertis
- Margo's Lights - Math Reader - Skip Counting
- The Roadside Stand - Math Reader - Tens and Ones
- Dave and Boots - Math Reader - Place Value
- The Number Machine - Math Reader - Value of Numbers
- Time to Take a Trip - Math Reader - Comparing Numbers
- Nature's Numbers - Math Reader - addition
- Butterfly Farm - Math Reader - addition
- Comic Books for Sale - Math Reader - 2 digit subtraction
- Party Plans - Math Reader - 2 digit addition and subtraction with regrouping
- The If Game - Math Reader - 3 digit numbers
- The Bug Boys - Math Reader - 3 digit subtraction

Websites

www.ABCYA.com

Place value

www.prodigygame.com

Standard Based Learning Game

www.xtramath.com www.math-drills.com	Math drills
www.themathworksheetsite.com	Resource for creating extra practice
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • Teacher modeling • Do the Math Intervention • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities • Centers 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Real World Videos • GoMath Stem Activities • GoMath Enrich Activities • Centers 	
English Language Learners <ul style="list-style-type: none"> • Teacher modeling • Vary activities by choice 	

- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.

	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Measurement and Data	Duration: March – April, ongoing
NJ Student Learning Standard: 2.MD	
Unit Summary	
<ul style="list-style-type: none"> ● Measure and estimate lengths in standard units. 	

- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

Unit Summary: Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.

Primary Interdisciplinary Connections	
Science	science experiments, manipulate data, sizes of the planets, measuring plant growth, develop knowledge of temperature and weather patterns in terms of fractions
Social Studies	map skills, geography, scale models
Language Arts	open ended questions, relevant read alouds related to math are used to introduce and reinforce math concepts
Technology	interactive games/websites and interactive Smartboards

21st Century Themes	
Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.
Civic Literacy	Students understand the skills of mapping, gridding, compass directions, and cardinal directions.

College and Career Readiness
Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and

persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

NJ Student Learning Standard: 2.MD

A.	<i>Measure and estimate lengths in standard units.</i>
2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
2.MD.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
B.	<i>Relate addition and subtraction to length.</i>
2.MD.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, and represent whole-number sums and differences within 100 on a number line diagram.
C.	<i>Work with time and money.</i>
2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
D.	<i>Represent and interpret data.</i>
2.MD.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.MD.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
NJ Student Learning Standards for Introduction	
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
3.MD.7	Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

	<p>b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.</p> <p>d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.</p>		
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters		
	Interdisciplinary Skills		
SL.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).		
SL.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.		
SL.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.		
	Technology		
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).		
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.		
	21st Century Life and Career		
CRP4.	Communicate clearly and effectively and with reason.		
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.		
<table border="1"> <tr> <td>Essential Understandings</td><td>Essential Questions</td></tr> </table>		Essential Understandings	Essential Questions
Essential Understandings	Essential Questions		

<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Measurement is used to understand and describe the world including sports, construction, and explaining the environment • The choice of measurement tools depends on the measurable attribute and the degree of precision desired • We can use our knowledge of addition and subtraction to solve problems involving lengths • People use data to describe the world and answer questions such as how many classmates are buying lunch today, how much it rained yesterday, or in which month are the most birthdays 	<ul style="list-style-type: none"> • What is the purpose of measurement? • How do we decide which tool to use to measure something? • How can number lines and rulers be used to find sum and difference? • How can information be gathered, recorded, and organized?
Evidence of Student Learning	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Other Assessments</p>
<p>Create race car out of various materials: Students measure how far their cars can race. Keep graphs, line plots, etc. of different distances.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Assessments, Conferencing • Portfolio • Math Journals • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • GoMath Unit Tests

	<ul style="list-style-type: none"> Quizzes <p>Benchmark Assessment</p> <ul style="list-style-type: none"> GoMath Benchmark Assessment Linkit Assessment B <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> Measure and estimate lengths in standard units: Chapters 8, 9 Relate addition and subtraction to length: Chapters 8, 9 Work with time and money: Chapter 7 Represent and interpret data: Chapters 8, 10 <p><i>Students will know...</i></p>	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> Measure a common object using the appropriate tool such as ruler to measure a book, etc. Measure a common object using two different units of measurement such as measuring a desk using both inches and feet, etc. Estimate the length of common objects such as a desk, a book, a chalkboard, etc.. using inches, feet, centimeters, and meters

<ul style="list-style-type: none">● Lengths can be measured and estimated● Addition and subtraction relate to length and measurement● Money has value and can be expressed using \$ and● The difference between analog and digital clocks, a.m. and p.m. and understand time increments● Data can be represented and interpreted	<ul style="list-style-type: none">● Measure two objects and express the difference in their lengths● Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units and equations with a symbol for the unknown number to represent the problem● Create a number line correctly placing whole numbers starting with 0, and use the number line to express sums and differences of whole numbers● Tell and write to the nearest minute and measure time intervals in minutes● Solve word problems involving addition and subtraction of time intervals in minutes● Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and cent symbols appropriately● Display the results of measuring objects to the nearest whole number by making a line plot● Draw a picture graph and bar graph to represent data	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation

Students will create Hairy Money Creatures.	Hairy money posters	Lower values (Basic Skills, Economically Disadvantaged) Higher values (Gifted and Talented)
Shopping activity: Students will choose 2 items to shop for, then using plastic coins show the amount they will spend in various ways	Plastic coins, various pictures of items from sale circulars	Pictures with values (English Language Learners, Basic Skills, Economically Disadvantaged) Lower values (Basic Skills, Economically Disadvantaged) Higher values (Gifted and Talented)
PayDay	Board game Pay Day	Students could play in pairs of two for extra support
Money Tic Tac Toe: Students will pick two cards with monetary values. Add the values together. If student gets the correct answer they put an x or an o on the board.	Tic Tac Toe board, plastic coins, money cards	Pictures with values (English Language Learners, Basic Skills, Economically Disadvantaged)

		<p>Lower values (Basic Skills, Economically Disadvantaged)</p> <p>Higher values (Gifted and Talented)</p>
Students will play Money Bingo.	Money bingo, chips	<p>Pictures with values (English Language Learners, Basic Skills, Economically Disadvantaged)</p> <p>Lower values (Basic Skills, Economically Disadvantaged)</p> <p>Higher values (Gifted and Talented)</p>
Students will sing various measurement songs.	www.flocbulary.com	Print song lyrics (Basic Skills, English Language Learners, Economically Disadvantaged)
Just in Time: Telling time	Just in Time game from Go Math Grab and Go Kit	Time cards to half hour and hour (Basic Skills,

		Economically Disadvantaged) Time cards to 5 minutes (Gifted and Talented)
Students will play Time Bingo.	Time bingo, chips	Students could play in pairs for extra support Time cards to half hour and hour (Basic Skills, Economically Disadvantaged) Time cards to 5 minutes (Gifted and Talented)
How Long?: Predicting and measuring	How Long? Game from Go Math Grab and Go Kit	
Race to the Finish: reading data on a graph	Race to the Finish game from Go Math Grab and Go Kit	
Math Literature		
<ul style="list-style-type: none"> Counting on Frank by Rod Clement How Big is a Foot by Myller, Rolf Inch by Inch by Leonna, Leo Pigs in the Pantry: Fun with Math and Cooking by Amy Axelrod 		

- Twelve Snails to One Lizard: A Tale of Mischief and Measurement by Susan Hightower
- Benny, Bessie, and the Blueberries - Math Reader - equal shares
- Coin Trick - Math Reader - values of coins
- Time to Go Shopping - Math Reader - money
- All About Time - Math Reader - time
- All The Time - Math Reader - time
- Is it Time Yet? - Math Reader - time
- Nature Walk - Math Reader - measurement
- A Trip to the Pond - Math Reader - metric measurement
- Wow! Fluffo Sure Can Eat - Math Reader - data collection
- What do You Like? - Math Reader - data collection and display

Websites

www.prodigygame.com

Standard Based Learning Game

www.abcya.com

Coin identification/Counting Coins

www.themathworksheetsite.com

Resource for creating extra practice

Suggested Options for Differentiation

Basic Skills/Economically Disadvantaged

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Centers
- Anchor charts, visuals

Gifted and Talented

- GoMath Real World Videos
- GoMath Stem Activities
- GoMath Enrich Activities
- Centers
- Anchor charts, visuals
- Multi-step problems

English Language Learners

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Anchor charts, visuals

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling
- Anchor charts, visuals

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration			CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Unit 4: Geometry	Duration: Ongoing
NJ Student Learning Standard: 2.G	
Unit Summary Unit Summary: Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.	

Primary Interdisciplinary Connections	
Science	shapes of the planets, experiments, symmetry in nature, timeline of moon phases
Social Studies	geography- state and continents, map skills
Language Arts	open ended questions, math literacy stories, shape journal entry
Technology	interactive games/websites, explore and expand visual patterns using the computer, and interactive Smartboard

21st Century Themes	
Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.
Civic Literacy	Students understand the skills of mapping, gridding, and compass directions

College and Career Readiness

Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

NJ Student Learning Standard: 2.G

A.	<i>Reason with shapes and their attributes.</i>
2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
NJ Student Learning Standards for Introduction	
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.
Interdisciplinary Skills	
SL.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.

SL.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.
	Technology
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Career
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP4.	Communicate clearly and effectively and with reason.
Essential Understandings	Essential Questions
<i>Students will understand that...</i> <ul style="list-style-type: none"> Geometric properties can be used to construct geometric figures Geometric relationships provide a means to make sense of a variety of phenomena Use fractions to name parts of groups and find fractional parts of groups 	<ul style="list-style-type: none"> How can spatial relationships be described by careful use of geometric language? How can area, perimeter and fractional parts be determined through the use of rows and columns? How do fractions help you share equally?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments

Create race car out of various materials and geometric

shapes: Race cars will then be used to race and keep track of distances. Students work in teams to create fastest car.

Formative Assessments

- Teacher Observation
- Performance Assessments
- Games
- Anecdotal Records
- Oral Assessments, Conferencing
- Portfolio/Math Journals
- Daily Classwork
- Pre-assessments

Summative Assessments

- GoMath Unit Tests
- Quizzes

Benchmark Assessment

- GoMath Benchmark Assessment
- EOY Benchmark
- Linkit Assessment C

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess
- Modified Classwork Assignments
- Modified Benchmarks

	<ul style="list-style-type: none">GoMath Reteach Activities and WorksheetsProject Based Assessments with Scoring Rubric	
Knowledge and Skills		
Content	Skills	
Cluster: <ul style="list-style-type: none">Reason with shapes and their attributes: Chapter 11 <i>Students will know...</i> <ul style="list-style-type: none">A given number of angles or a given number of faces on a specified shapeShapes are classifiedEqual shares of identical wholes need not have the same shape	<i>Students will be able to ...</i> <ul style="list-style-type: none">Analyze shapes by examining their sides and anglesDecompose and combine shapes to make other shapesBuild, draw and analyze two- and three-dimensional shapes	
Instructional Plan		
Suggested Activities	Resources	Suggested Options for Differentiation
Hershey Bar Fractions, break Hershey Bar into fractions to match parts of a story		Models with numbers (Basic Skills, English Language Learners, Economically Disadvantaged)
My Shape Riddle: Design a shape on a geoboard and give clues about your shape to your partner	Geoboards, rubber bands, http://www.k-	Shape pictures as model (English Language

	5mathteachingresources.com/support-files/my-shape-riddle.pdf	Learners, Basic Skills, Economically Disadvantaged) Difficult shapes (Gifted and Talented)
Fraction Barrier Game work with a partner, color fraction and give partner clues. Take away divider and see how closely fractions match.	http://www.k-5mathteachingresources.com/support-files/fraction-barrier-game.pdf	Models with numbers (Basic Skills, English Language Learners, Economically Disadvantaged)
Happy Helpers: Identifying 2 dimensional shapes	Happy Helpers game from Go Math Grab and Go Kit	Picture models (English Language Learners, Basic Skills, Economically Disadvantaged)
Hidden Figures: Classify 2 dimensional figures	Hidden Figures game from Go Math Grab and Go Kit	Picture models (English Language Learners, Basic Skills, Economically Disadvantaged)
Math Literature		
<ul style="list-style-type: none"> • The Greedy Triangle by Marilyn Burns • Grandfather Tang's Story by Ann Tompert • Lao Lao of Dragon Mountain by Margaret Bateson-Hill • Shapes, Shapes, Shapes by Tana Hoban • Gator Pie by Louise Matthews 		

<ul style="list-style-type: none"> • Eating Fractions by Bruce McMillan • Only One by Marc Harshman • Building a Mini-Park - Math Reader - 3 dimensional shapes • Square Fair - Math Reader - decomposing 3 dimensional shapes • Taking Shape - Math Reader - seeing shapes within shapes 	
Websites	
www.themathworksheetsite.com	Resource for creating extra practice
www.prodigygame.com	Standard Based Learning Game
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged <ul style="list-style-type: none"> • <i>Do The Math</i> intervention • Teacher modeling • Vary activities by choice • Reminders as needed • Pre-Teach vocabulary or pre-teach lesson • GoMath Reteach Activities • GoMath Intensive and/or Strategic Intervention activities • Centers • Anchor charts, visuals 	
Gifted and Talented <ul style="list-style-type: none"> • GoMath Real World Videos • GoMath Stem Activities • GoMath Enrich Activities 	

- Centers
- Anchor charts, visuals
- Multi-step problems

English Language Learners

- Teacher modeling
- Vary activities by choice
- Reminders as needed
- Pre-Teach vocabulary or pre-teach lesson
- GoMath Reteach Activities
- GoMath Intensive and/or Strategic Intervention activities
- Anchor charts, visuals

Special Education

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Preview lesson and pre-teach vocabulary
- Use visual cues
- Teacher modeling
- Anchor charts, visuals



Estell Manor School District

Mathematics Curriculum Grade 3

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1: Operations and Algebraic Thinking	Approximately 35 Days
Unit 2: Number and Operations in Base Ten	Approximately 35 Days
Unit 3: Number and Operations—Fractions	Approximately 35 Days
Unit 4: Number and Operations—Fractions	Approximately 35 Days
Unit 5; Geometry	Approximately 35 Days

Core Materials:

GoMath
Do The Math
Linkit

Grade 3 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division
- Understand properties of multiplication and the relationship between multiplication and division
- Multiply and divide within 100
- Solve problems involving the four operations, and identify and explain patterns in arithmetic

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic

Number and Operations- Fractions

- Develop understanding of fractions as numbers

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- Represent and interpret data
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

Geometry

- Reason with shapes and their attribute

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy			CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers			CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer			CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation			CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none"> • What is the problem asking? • How will you use that information? • What other information do you need? • Why did you choose that operation? • What is another way to solve that problem? • What did you do first? Why? • What can you do if you don't know how to solve a problem? • Have you solved a problem like this one? • When did you realize your first method would not work? • How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none"> • What is a situation that could be represented by this equation? • What operation did you use to represent the situation • Why does that operation represent the situation? • What properties did you use to find the answer? • How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none"> • Will that method always work? • How do you know? • What do you think about what the other student said? • Who can tell us about a different method? • What do you think will happen if ...? • When would that not be true? • Why do you agree/disagree with what the other student said? • What do you want to ask the other student about that method? • How does that drawing support your work?

Practice 4: Model with mathematics	<ul style="list-style-type: none"> • Why is that a good model for this problem? • How can you use a simpler problem to help you find the answer? • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer? • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
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MP #1	Made sense of problems, evaluated approaches, and persevere in solving them.	Made sense of problems and persevere in solving them.	Made sense of problems.	With support, made sense of problems.
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	Constructed viable arguments and critique the reasoning of others.	Constructed viable arguments.	Compared arguments.
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.
MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and details when calculating and communicating. Examined details of	Attends to precision and details when calculating and communicating.	Where accurate when calculating and communicating.	Where clear when calculating and communicating.

	claims and made explicit use of definitions.			
MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns to solve problems.	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and expressed regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1: Number and Operations in Base Ten	Duration: September – October, Ongoing
NJ Student Learning Standard: 3.NBT	
Unit Summary	

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Cluster Summary:

Prior to implementing rules for rounding, students need to have opportunities to investigate place value. A strong understanding of place value is essential for the development of number sense and the subsequent work that involves rounding numbers.

Building on previous understandings of the place value of digits in multi digit numbers, place value is used to round whole numbers. Dependence on learning rules can be eliminated with strategies such as the use of a number line to determine which multiple of 10 or of 100, a number is nearest (5 or more rounds up, less than 5 rounds down). As students' understanding of place value increases, the strategies for rounding are valuable for estimating, justifying, and predicting the reasonableness of solutions in problem solving.

Strategies used to add and subtract two digit numbers are now applied to fluently add and subtract whole numbers within 1000. These strategies should be discussed so that students can make comparisons and move toward efficient methods.

By applying understanding of place value, students extend their work in multiplication to multiply one-digit numbers with multiples of 10. They go beyond tricks that hinder understanding such as "just adding zeros". For example, the product 4×30 can be represented as 4 groups of 3 tens, which is 12 tens, which is 120.

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to molecules to organisms and ecosystems
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

	interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)
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21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

NJ Student Learning Standard: 3.NBT	
A.	Use place value understanding and properties of operations to perform multi-digit arithmetic
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.
	NJ Student Learning Standards for Introduction
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	
	Interdisciplinary Skills	
SL.3.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.	
SL.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).	
	Technology	
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.	
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).	
	Interdisciplinary Skills	
Essential Understandings <i>Students will understand that...</i>		Essential Questions
<ul style="list-style-type: none"> Building and taking apart numbers provides a deep understanding of the base 10 number system. Knowledge and use of place value for large numbers provides context for distances. Addition and subtraction are related 		<ul style="list-style-type: none"> How do patterns in our place value system assist in comparing whole numbers? How does understanding place value help us add and subtract large numbers? How are the operations of addition and subtraction related? What are efficient methods for finding multiples of numbers?
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments

<p><u>Amusement Park Debacle:</u></p> <p>Objective: Students must create a spreadsheet of all different ways that they can allocate their tickets. Students will analyze the list and choose the combination that gets them the most for their tickets. Student will explain which option works best and why.</p> <p>You are going to the greatest amusement park ever. All the Raptor Rides cost 4 tickets. Jurassic Rides are just two tickets. All Gator Games and T-Rex Treats are a bargain at one ticket each. But a ride on the heart-pounding Terrible Triceratops costs six tickets! If you were given 20 tickets find as many different combinations of ways that you could use your tickets as you can. Which combination would you use? Why?</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Oral Assessments • Portfolio/Math Journals Daily • Daily Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Go Math Tests • Go Math Quizzes • BOY Go Math Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Visual Representation of Skills Assess • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
<p align="center">Mathematical Practices</p>	
<p>MP 2: Reason Abstractly and Quantitatively</p> <p>MP 3: Construct Viable Arguments & Critique the Reasoning of Other</p>	

Vocabulary	
add, addition, addition table, multiplication table, place value, properties of operations, rounding, strategy, subtract, ten, whole number digit, equation, even, number, sum, difference, odd, one, hundred	
Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Use place value understanding and properties of operations to perform multi-digit arithmetic: Chapters 1, 2, 5 <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Place value and properties of operations to add and subtract • How to use a variety of estimation strategies (e.g., rounding and mental math) for estimating both quantities and the result of computations to determine if something is reasonable • Multiples of ten are based on place value 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. • Use place value to round whole numbers to the nearest 10 or 100. • Multiply one digit whole numbers by multiples of 10. • Use a variety of strategies to work with numbers to: <ul style="list-style-type: none"> o Round numbers to the nearest 10 and 100 o Estimate sets of large quantities • Read, write and model numbers in standard, expanded, and written form up to 4 digits • Compare and order whole numbers to the thousands Rename a number by regrouping its value (e.g., rename 15 as 1 ten 5 ones or 15 ones) • Identify the value of a digit given its place in a number • Recognize and describe arithmetic patterns on an addition table and multiplication table

Instructional Plan	
Suggested Activities	Resources
Number sense game - Players draw 4 cards, place the cards in place value order to try to create the largest 4 digit number. Whoever created the largest 4 digit number wins the round.	Everyday math number cards
Rounding in the Real World - Students must look over a grocery list and round the values of the items to decide how much money they need to bring with them to the store.	Grocery Store Circular (i.e. ShopRite)
Multiples of 10 Shopping list - Students are given a shopping list and have to purchase enough items for the class.	Store Circular (CVS, Walmart, etc.)
Greater Than, Less Than Family Feud game - students will play in a family feud-style game show competing one on one identifying if numbers are greater than, less than, or equal to.	Index cards with various numbers on each
Place Value game - Students will be participated in a game that demonstrates their knowledge of place value. In two teams, students will send one person at a time to come to the board, where they will place sentence strips over numbers identifying the correct place value. Students will work as a team to complete a 4+ digit number with correct place values.	Sentence strips with place value names written on them, magnets for the back of sentence strips, white board, expo markers
Vocabulary Activity - Students will compare and contrast vocabulary words that they can use as clues to determine if they are solving and addition or subtraction word problem. A t-chart or venn diagram can be used to organize these ideas. Possible Vocabulary Words: add, subtract, sum, difference, plus, both, join, in all, combined, increased, how many more, left, less than, take away, minus, remain)	T-chart or venn diagram, list of vocabulary words, sample word problems to practice this skill with
Math Literature	

Place Value	
<ul style="list-style-type: none"> • <u>The King's Commissioners</u> by Aileen Freidman • <u>Sir Cumference and the All the King's Tens</u> by Cindy Neuschwander • <u>Earth Day--Hooray!</u> by Stuart Murphy • <u>How much is a Million?</u> by David Schwartz • <u>The Math Curse</u> by Jon Scieszka and Lane Smith • 	
Addition	
<ul style="list-style-type: none"> • <u>The Mission of Addition</u> by Brian P. Cleary • <u>Addition Annie</u> by David Gisler • <u>The Hershey's Kisses Addition Book</u> by Jerry Pallotta • <u>Double Play: Monkeying Around with Addition</u> by Betsy Franco • 	
Subtraction	
<ul style="list-style-type: none"> • <u>The Action of Subtraction</u> by Brian P. Cleary • <u>Elevator Magic</u> by Stuart J. Murphy • <u>Subtraction Action</u> by Loreen Leedy 	
Websites	
http://nlvm.usu.edu/en/nav/topic_t_1.html	National Library of Virtual Manipulatives
http://www.mathwire.com/numbersense/placevalue.html http://www.mathwire.com/numbersense/morepv.html	Number Sense and Place Value
http://www.studyisland.com/	Study Skills
https://www.flocabulary.com/subjects/math/	Educational Hip-Hop Songs and Videos
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk	
<ul style="list-style-type: none"> • Multiplication table 	

- 2-digit by one factors
- Math on the Spot Tutorial
- Intensive Intervention
- Regulate place value
- Regulate total number of items
- Anchor charts, visuals

English Language Learners

- Multiplication table
- 2-digit by one factors
- GoMath! Spanish edition
- Regulate place value
- Regulate total number of items
- Math on the Spot Tutorial
- Bilingual Math Boards
- ELL Activity Guide
- Anchor charts, visuals

Gifted & Talented

- Regulate place value
- Regulate total number of items
- 2-digit by one factors
- GoMath enrichment activities
- GoMath! Real World Videos
- GoMath! STEM Activities
- Multi-step problems

Special Education/504

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Number line
- Input/output table
- Hundreds chart
- Addition table
- Multiplication table
- Associative Property
- Commutative Property
- Study guides/study sheets
- Multi-sensory models
- Manipulatives
- Modified assignments

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.

	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: Operations and Algebraic Thinking	Duration: October – December, Ongoing
NJ Student Learning Standard: 3.OA	
Unit Summary <ul style="list-style-type: none"> • Represent and solve problems involving multiplication and division. • Understand properties of multiplication and the relationship between multiplication and division. • Multiply and divide within 100. • Solve problems involving the four operations, and identify and explain patterns in arithmetic. Unit Summary:	

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.

Primary Interdisciplinary Connections

Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Engineering and Design.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers

CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

NJ Student Learning Standard: 3.OA	
A.	Represent and solve problems involving multiplication and division
3.OA.1	Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as 5×7 .
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe and/or represent a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \div 3$, $6 \times 6 = ?$.
B.	Understand properties of multiplication and the relationship between multiplication and division.
3.OA.5	Apply properties of operations as strategies to multiply and divide.2 Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)
3.OA.6	Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.
C.	Multiply and divide within 100.
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
D.	Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding		
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.		
	8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. A. Technology Operations and Concepts: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.		
	9.1 21st Century Life Skills: All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures. B. Creativity and Innovation: Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.		
	Interdisciplinary Skills		
SL.3.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.		
SL.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).		
	Technology		
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.		
	21st Century Life and Career		
CRP4.	Communicate clearly and effectively and with reason		
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.		
<table border="1"> <tr> <td>Essential Understandings <i>Students will understand that...</i></td><td>Essential Questions</td></tr> </table>		Essential Understandings <i>Students will understand that...</i>	Essential Questions
Essential Understandings <i>Students will understand that...</i>	Essential Questions		

<ul style="list-style-type: none"> • The four basic arithmetic operations are interrelated, and the properties of each may be used to understand the others. • Mathematical concepts can be understood using a variety of models. • Numbers are able to represent quantity, position, location, and relationships, and symbols may be used to express these relationships. 	<ul style="list-style-type: none"> • Why do we use symbols to represent missing numbers? • What do multiplication and division mean? • How are multiplication and division related? • Why do we use symbols to represent missing numbers? • How can we predict the next element in a pattern?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<u>5k for a Charity</u> <ul style="list-style-type: none"> • Students will decide on a charity and a target goal to plan a 5k • Estimate the number of participants and registration cost needed in order to reach their goal. • Estimate the number and cost of T-shirts needed for each participant for the run and deduct that from their total earnings • Decide on the number of volunteers needed to work the race • Determine the age brackets and time for each race • Estimate the number of water bottles and cost needed to provide the participants 	Formative Assessments <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals • Daily Classwork • Pre-assessments Summative Assessments <ul style="list-style-type: none"> • Tests • Quizzes

<ul style="list-style-type: none"> • Map out 3.1kilometers route that will be taken for the run <p><u>Vacation Budget</u></p> <p>You are planning a vacation to Washington D.C. for the weekend for you and a friend. You will be there for 3 days and 2 nights.</p> <ul style="list-style-type: none"> • Students must decide the cost of the vacation (hotel, food, travel, tourist attractions). • Students must create a full detailed itinerary for their weekend trip. • Students must research and describe the tourist attractions they plan to visit. 	<ul style="list-style-type: none"> • National/State/District Wide Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment • Linkit assessment B <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Mathematical Practice	
MP1: Make sense of Problems and Persevere in Solving Them MP 4: Model with Mathematics MP 6: Attend to precision MP 7: Look for and Make use of Structure	
Vocabulary	

equation, multiply, multiple of ten, multiplication, number, one-digit number, place value, product, properties of operation, relationship, strategy, ten, total, unknown, whole number, factor, multiples, divide, dividend, division, divisor, equation, equal, number, one digit number, properties of operation, quotient, relationship, strategy, unknown, whole number, arrays, skip counting, bar models, fact families, array, estimation, group/grouping, mental math, measurement, operation, quantity, reasonable, rounding, strategy, symbol, unknown, variable, word problem

Knowledge and Skills

Content

Cluster:

- Represent and solve problems involving multiplication and division: Chapters 3, 4, 6, 7
- Understand properties of multiplication and the relationship between multiplication and division: Chapters 3, 4, 5, 6,
- Multiply and divide within 100: Chapters 4, 6, 7
- Solve problems involving the four operations, and identify and explain patterns in arithmetic: Chapters 4, 5, 7

Students will know...

- Many situations in daily life can be modeled with multiplication and division
- Problem solving in daily life may include unknown variables that impact outcomes
- Patterns exist in the relationship of multiplication and division

Skills

Students will be able to ...

- Interpret products of whole numbers.
- Interpret whole number quotients.
- Use multiplication and division to solve word problems.
- Determine the unknown whole number in an equation of three whole numbers.
- Apply properties of operations to multiply and divide
- Memorize all products of two single-digit numbers.
- Solve two step word problems using four operations and solving for the unknown.
- Identify patterns in arithmetic.
- Identify multiplication patterns including on a times table
- Represent multiplication with objects, diagrams, pictorial representations, and arrays
- Solve and write simple number sentences and word problems involving multiplication
- Understand multiplication as repeated addition and joining of equivalent sets Identify when to use multiplication

- Understand multiples (skip counting) and its connection to multiplication
- Recall basic facts for all products (0×0 to 9×9) Multiply one-digit whole numbers by multiples of 10 (example: 9×70)
- Multiply a two-digit number by a one-digit number using a variety of strategies
- Apply properties of operations (commutative, associative, and distributive) to multiply
- Separate a group into equal sets
- Use models to demonstrate division Solve division problems without remainders up to 100
- Recall basic facts for division using a variety of strategies
- Solve unknown factor division problems using multiplication
- Determine when to use division in a problem
- Use various strategies for division to solve problems
- Show division as an inverse operation of multiplication
- Construct fact families
- Solve division problems using pictures, numbers, and words
- Use the problem solving process to identify:
 - What are the facts
 - What is the question
 - What can we eliminate o Choose a strategy and solve
 - Does the answer make sense
- Choose a strategy to solve a problem: o Picture Models

	<ul style="list-style-type: none"> o Arrays • Open Number Lines • Bar Models (Tape Diagrams) o Choose an operation • Guess and Check • Make a table or an organized list • Use logical reasoning • Look for a Pattern • Communicate mathematical thinking through oral and written language and explain and justify answers • Use a letter or symbol to stand for an unknown quantity in a two-step word problem. • Use mental math strategies to assess the reasonableness of an answer. • Use rounding as an estimation strategy
Instructional Plan	
Suggested Activities	Resources
Multiplication War Card Game - Players flip 2 cards and multiply. Player with higher product wins hand. Player with most cards at the is the winner	Playing cards
Baseball Multiplication - Batter rolls 2 dice and multiplies the numbers. Batter moves along baseball diamond depending on product. Runs are scored when a batter reaches home plate	Everyday Math Baseball Multiplication Template
Multiplication Bingo - Using a bingo board students put 24 different products on their board. Teacher draws 2 playing cards to create a product. If students have the product they	Bingo board (or any 5 by 5 graph), Number playing cards, and markers (chips)

mark it on their boards, 1st person to get 5 across/down/or diagonally wins.	
Giddy Up Round Up - Students create groups to explore the relationship between multiplication and division.	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/49479
Multiplication apps - Various multiplication apps such as Monkey Multiplication, multiplication sushi, multiplication bubbles, etc.	iPads/Chromebooks
Students will pretend to be the teacher and create a graphic organizer that relates multiplication and addition, and addition and subtraction. Students will then present their graphic organizer to the class and the class will decide which one they will use as a reference.	Anchor chart paper, markers
Math Literature	
<p>Multiplication:</p> <ul style="list-style-type: none"> • <u>Hershey's Kisses</u> by Jerry Pollatta <p>Division:</p> <ul style="list-style-type: none"> • <u>Safari Park</u> by Stuart_Murphy • <u>The Doorbell Rang</u> by Pat Hutchings • <u>Divide and Ride</u> by Stuart J. Murphy • Go Math: Grab and Go Centers Kit- Various stories in kit. 	
Websites	
https://www.funbrain.com/math/	Basic Multiplication and Division Facts
http://www.factmonster.com/mathmoney.html	Basic Multiplication and Division Facts
https://prodigygame.com	Standard-Based Learning Game

http://mathwire.com/	Offers games and activities on multiplication and division concepts
http://www.studyisland.com/	Study Skills
https://www.flocabulary.com/subjects/math/	Educational Hip-Hop Songs and Videos
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Multiplication table • 2-digit by one factors • Math on the Spot Tutorial • Intensive Intervention • Centers • Anchor charts, visuals 	
English Language Learners <ul style="list-style-type: none"> • Multiplication table • 2-digit by one factors • GoMath! Spanish edition • Math on the Spot Tutorial • Bilingual Math Boards • ELL Activity Guide 	
Gifted & Talented <ul style="list-style-type: none"> • 2-digit by one factors • GoMath! Real World Videos • GoMath! STEM Activities 	

- Centers
- Multi-step problems
- Anchor charts, visuals

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Manipulatives
- Anchor charts, visuals

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Number and Operations - Fractions	Duration: January – February, Ongoing
NJ Student Learning Standard: 3.NF	
Unit Summary <ul style="list-style-type: none"> • Develop understanding of fractions as numbers Unit Summary: <p>Students develop an understanding of fractions, beginning with the representation of parts compared to a whole. Students understand that the size of a fractional part is relative to the size of the whole. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.</p>	

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.

CRP6	Demonstrate creativity and innovation
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

NJ Student Learning Standard: 3.NF	
A.	Develop understanding of fractions as numbers.
3.NF.1	Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.
3.NF.2	<p>Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <p>a. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line.</p> <p>b. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.</p>
3.NF.3	<p>Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.</p> <p>a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</p> <p>b. Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.</p> <p>c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram.</p>

	d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.				
NJ Student Learning Standard for Introduction					
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.				
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.				
SL.3.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.				
SL.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).				
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.				
CRP4.	Communicate clearly and effectively and with reason.				
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.				
<table border="1"> <tr> <th>Essential Understandings <i>Students will understand that...</i></th><th>Essential Questions</th></tr> <tr> <td> <ul style="list-style-type: none"> Fractions represent equal parts of a whole Unit fractions are represented on a number line Fractions with different numerators and denominators can be compared by reasoning about their size </td><td> <ul style="list-style-type: none"> How many ways can a whole number be represented? How do we show part of a unit? How can a fraction be represented in different equivalent forms? </td></tr> </table>		Essential Understandings <i>Students will understand that...</i>	Essential Questions	<ul style="list-style-type: none"> Fractions represent equal parts of a whole Unit fractions are represented on a number line Fractions with different numerators and denominators can be compared by reasoning about their size 	<ul style="list-style-type: none"> How many ways can a whole number be represented? How do we show part of a unit? How can a fraction be represented in different equivalent forms?
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Evidence of Student Learning					

Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p><u>What's on the Menu</u></p> <ul style="list-style-type: none"> • Students determine 3 items for a well-balanced nutritious menu which includes soup (appetizer), main entree, and a dessert • Research well balanced meals and portions needed for your menu (food pyramid) • Research recipes for each item on your menu, including each ingredient and the fractional parts needed to prepare your items on the menu <p>You were just hired as the chef of a new restaurant in town. You have been asked to design a specials menu for opening night. The menu must include an appetizer, main entree, and dessert. You must include a vivid description of each item on your menu, the recipe for each item, as well as the cost.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals Daily • Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Go Math Tests • Go Math Quizzes • National/State/District Wide Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • Go Math Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments

	<ul style="list-style-type: none"> • Modified Benchmarks • Go Math Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Mathematical Practice	
MP4: Model with Mathematics MP8: Look for and Express Regularity in Repeated Reasoning	
Vocabulary	
compare, comparison, denominator, equal, equivalent, fraction, interval, length, number, number line, numerator, one, one-digit number, part, point, represent, size, symbol, visual fraction model, whole, zero	
Knowledge and Skills	
Content	Skills
Cluster: <ul style="list-style-type: none"> • Develop understanding of fractions as numbers: Chapters 8, 9 <i>Students will know...</i> <ul style="list-style-type: none"> • Fractions represent equal parts of a whole unit • Fractions are represented on a number line • Fractions can still be equivalent even though they appear to be different 	<i>Students will be able to ...</i> <ul style="list-style-type: none"> • Construct a fraction based on an object partitioned into equal parts. • Compare fractions by using visual fraction models and number lines to understand equivalent fractions. • Compare two fractions with the same numerator or the same denominator by reasoning about their size. • Identify fractions and equivalent fractions as part of a whole, part of a set, part of an area, and location on a number line • Use pictures, models, and numbers to identify and record fractions.

	<ul style="list-style-type: none"> • Compare and order fractions with like denominators using models, pictures, or using $<$, $>$, $=$, and justify with a visual model • Recognize and generate simple equivalent fractions (ie. $1/2 = 2/4$, $4/6 = 2/3$) and explain why the fractions are equivalent using models and pictures • Express whole numbers as fractions (ie. $3 = 3/1$, $4/4 = 1$) and recognize fractions that are equivalent to whole numbers
Instructional Plan	
Suggested Activities	Resources
Fraction top it- Players flip over one fraction card and compare who has the greater fraction.	Everyday math fraction cards
Equivalent Fraction strip game- Use 5 strips of paper. Each strip represents 1 whole, halves, quarters, eighths, and sixteenths. Students play with a partner to roll a fraction dice to place the fraction represented on the dice onto the whole. First person to fill in their whole strip wins.	Fraction strips (student made) fraction dice (teacher made)
Cut It Up- Students work with graham crackers to create different fractions and identify how as the denominator increases the size of each piece decreases.	https://www.education.com/pdf/dividing-fractions-graham-crackers/
Fraction Scavenger Hunt- Identify fractions in the real world.	Scavenger hunt checklist, paper, pencil

Recipe Fractions - Students follow a recipe and explore how fractions are used in the real world. Students will pretend to be a chef and present the recipe to a mock 'menu' identifying how many people the recipe can feed.	Provide recipes for favorite desserts, beverages, meals, etc.
Math Literature	
Fractions <ul style="list-style-type: none"> • <u>Fraction Fun</u> by David Adler • <u>Give Me Half!</u> By Stuart Murphy • <u>Clean Sweep Campers</u> by Lucille Recht Penner • <u>Hershey's Fractions Book</u> by Jerry Pollatta 	
Websites	
http://www.mathplayground.com/index_fractions.html	Fraction games
https://www.sheppardsoftware.com/mathgames/menus/fractions.htm	Fraction games
https://prodigygame.com/	Fraction games
https://www.sheppardsoftware.com/mathgames/fractions/equivalent_fractions_shoot.htm	Equivalent fractions
http://www.studyisland.com/	Study Skills
https://www.flocabulary.com/subjects/math/	Educational Hip-Hop Songs and Videos
Suggested Options for Differentiation	

Basic Skills/Economically Disadvantaged/Students at Risk

- Multiplication table
- Regulate the cards being used
- Provide fraction pieces
- Provide a checklist with fractions
- 2-digit by one factors
- Math on the Spot Tutorial
- Intensive Intervention
- Centers
- Anchor charts, visuals

English Language Learners

- Multiplication table
- Regulate the cards being used
- Provide a checklist with fractions
- 2-digit by one factors
- GoMath! Spanish edition
- Provide fraction pieces
- Math on the Spot Tutorial
- Bilingual Math Boards
- ELL Activity Guide

Gifted & Talented

- Regulate the cards being used
- 2-digit by one factors
- Peer lead
- GoMath! Real World Videos
- GoMath! STEM Activities

- Centers
- Anchor charts, visuals
- Multi-step problems

Special Education/504

- Follow all IEP modifications/504 plan
- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
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Unit 4: Measurement and Data	Duration: March – April, Ongoing
NJ Student Learning Standard: 3.MD	

Unit Summary

- Solve problems involving measurement and estimation
- Represent and interpret data
- Geometric Measurement: Understand concepts of liquid volume, mass, perimeter, area and relate area to multiplication and to addition.

Unit Summary:

A clock is a common instrument for measuring time. Learning to tell time has much to do with learning to read a dial-type instrument and little with time measurement. Building on previous understanding of measuring time, students will tell and write time to the nearest minute and measure time intervals in minutes.

Representation of a data set is extended from picture graphs and bar graphs with single-unit scales to scaled picture graphs and scaled bar graphs.

Students are to measure lengths using rulers marked with halves and fourths of an inch and record the data on a line plot.

Students will recognize perimeter and area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.

Primary Interdisciplinary Connections

Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Motions and Stability, Heredity, Biological Evolution and Earth Systems.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under <i>Teacher Resources</i>)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage,

	<p>evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.</p> <p>interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)</p>
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21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

NJ Student Learning Standard: 3.MD	
A.	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). ⁶ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
B.	Represent and interpret data.

3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
C.	Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
3.MD.5	<p>Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p>a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.</p> <p>b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.</p>
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and nonstandard units).
3.MD.7	<p>Relate area to the operations of multiplication and addition.</p> <p>a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</p> <p>b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$.</p>

	c. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.		
D.	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.		
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.		
NJ Student Learning Standards for Introduction			
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.		
4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.		
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.		
	Interdisciplinary Skills		
SL.3.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.		
SL.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).		
	Technology		
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.		
	21st Century Life and Career		
CRP4	Communicate clearly and effectively and with reason		
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.		
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Essential Understandings <i>Students will understand that...</i>	Essential Questions		

<ul style="list-style-type: none"> • Time measurement is a means to organize and structure each day and our lives. • Collection and use of data provides better understanding of people and the world. • Measurements can be used to describe, compare, and make sense of phenomena. 	<ul style="list-style-type: none"> • Why is it important to be able to tell time? • What can data tell you about your class or school? • How do data displays help us understand information? • What is the purpose of measurement?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p><u>Creating a Zoo Habitats</u></p> <p>Objective: You are an assistant that works with threatened and endangered animals at the zoo, your first job is to collect data and plan living spaces for different animals.</p> <ul style="list-style-type: none"> • Research endangered/threatened zoo animals that could be represented in their zoo. • Research their weight, lengths, heights, and masses • Categorize the zoo animals based on mammals, reptiles, amphibians, birds, & fish and their sub categories. • Design the proper habitat for each of the animals based on area and perimeter. • Create a zone in the zoo based on each animal class 	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips • Games • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals Daily • Classwork • Pre-assessments <p>Summative Assessments</p> <ul style="list-style-type: none"> • Go MathTests • Go Math Quizzes • Linkit Skills assessment

<ul style="list-style-type: none"> Design a zoo map guide that represents their zoo's layout. 	<p>Benchmark Assessment</p> <ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
<p align="center">Mathematical Practices</p>	
<p>MP 2: Reason Abstractly and Quantitatively</p> <p>MP 5: Use appropriate tools strategically</p> <p>MP6: Attend to Precision</p>	
<p align="center">Vocabulary</p>	
<p>add, addition, additive, area, area model, attribute, count, decompose/decomposition, distributive property, divide, estimation, gram, kilogram, liter, mass, mathematical problem, measurement, measurement scale, multiply, number line, part, one-step problem, product, rectangle, real-world problem, represent, scale, side length, square foot, square inch, square meter, subtract, time interval, time, unit, word problem, whole number, axis, bar graph, category, data, data set, fourth (fraction), half, horizontal scale, inch, information, length, line plot, mathematical problem, one-step problem, picture graph, perimeter, polygon, quarter (one-fourth), real-world problems, rectangle, represent, ruler, side length, two-step problem, unit, unknown</p>	
<p align="center">Knowledge and Skills</p>	

Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects: Chapter 10 • Represent and interpret data: Chapters 2, 10 • Geometric measurement: understand concepts of area and relate area to multiplication and to addition: Chapter 11 • Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures: Chapter 11 <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • Time increments on analog and digital clocks • Data can be displayed using various types of graphs to organize and explain information • Lengths can be measured to describe countless objects 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Tell and write time to the nearest minute and measure time intervals • Solve word problems involving addition and subtraction of time intervals in minutes • Interpret and represent data by solving 1 step and 2 step word problems based on information presented in graphs • Measure lengths indirectly and by repeating length units • Estimate, compare and measure ounces, pounds, grams and kilograms • Estimate, compare, and measure degrees in Fahrenheit • Estimate, compare, and measure cups, pints, quarts, gallons, milliliters, liters • Solve one-step problems with the same unit of measurement • Choose appropriate units of measurement to solve real life problems • Express time using quarter after, quarter of, half past, before and after, A.M. and P.M. • Calculate elapsed time within an hour and over more than an hour • Find the perimeter of any given polygon by adding the sides with standard units

	<ul style="list-style-type: none"> • Find area of rectangles using manipulatives or counting by squares in an array • Describe and identify rectangles with the same perimeter and different areas or with the same area and different perimeters • Understand and apply multiplication and addition to determine areas of rectangles • Decompose shapes to find area using the distributive property • Estimate, count and use appropriate units to find perimeter and area of figures and real world objects • Gather, organize and interpret data from a variety of sources • Discuss data collected and determine appropriate ways to display data • Organize, create and display data using bar graphs, charts/table, pictographs, and line plots • Create and interpret keys/legends • Estimate, compare, and measure half- inches, quarter inches, inches, feet, yards, centimeters, meters • Display data from measuring lengths with precision to $\frac{1}{2}$ or $\frac{1}{4}$ inch on a ruler
Instructional Plan	
Suggested Activities	Resources
Students will collect data from classmates and create a graph to represent the findings.	http://www.mrnussbaum.com/coolgraphing.htm

Student will collect data from a group of objects and organize it into a table. Then transfer the information from the table to a graph.	Paper, pencils, and objects being used
Students will find the area and perimeter of the students' first and/or last name using graph paper.	graph paper, crayons, colored pencils, etc.
Students with using the game Minecraft students will work with a partner to create assigned areas and perimeters of rectangles and squares with the use of the tools	Intermediate Mac Lab/Computer Lab Minecraft servers
Students will pretend they are architects and design their "dream home" using grid paper. Each students must have bedrooms, bathrooms, living room, dining room, kitchen, front yard, and backyard. After students draw it out, they will identify the area and perimeter of each room on a separate sheet of paper.	Grid paper, crayons
Math Literature	
Time: <ul style="list-style-type: none"> • <u>Clocks and More Clocks</u> by Pat Hutchings • <u>Telling Time with Big Mama Cat</u> by Dan Harper • <u>Get Up and Go!</u> by Stuart Murphy Graphing: <ul style="list-style-type: none"> • <u>The Best Vacation Ever!</u> by Stuart Murphy • <u>Lemonade for Sale</u> by Stuart Murphy • <u>Tiger Math: Learning to Graph from a Baby Tiger</u> by Ann Whitehead Nagda 	
Websites	
http://www.brainpop.com/math/numbersandoperations/elapsedtime/	Brainpop - Number and Operations
http://www.brainpopjr.com/math/time/timetotheminute/previous.weml	Brainpop- Time

http://www.abcya.com/telling_time.htm	Telling Time
http://www.ehow.com/list_6525014_activities-elapsedtime-3rd-grade.html	Elapsed Time
http://www.amblesideprimary.com/ambleweb/mentalmaths/grapher.html	Bar Graph
http://nces.ed.gov/nceskids/createagraph/default.aspx	Picture Graphs and Bar Graphs
http://www.shodor.org/interactivate/activities/BarGraph/	Interactive Bar Graphs
http://www.mathplayground.com/area_perimeter.html	Finding the Area and Perimeter of Rectangles
http://www.studyisland.com/	Study Skills
https://www.flocabulary.com/subjects/math/	Educational Hip-Hop Songs and Videos
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Multiplication table • Supply students with different sized groups of objects. (i.e fruit snacks) • 2-digit by one factors • Math on the Spot Tutorial • Intensive Intervention • Assign easier/complex areas and perimeters • Regulate the amount of data • Anchor charts, visuals • Centers 	
English Language Learners <ul style="list-style-type: none"> • Multiplication table 	

- Supply students with different sized groups of objects. (i.e fruit snacks)
- 2-digit by one factors
- GoMath! Spanish edition
- Assign easier/complex areas and perimeters
- Math on the Spot Tutorial
- Bilingual Math Boards
- Regulate the amount of data
- ELL Activity Guide
- Anchor charts, visuals

Gifted & Talented

- Multiplication table
- Supply students with different sized groups of objects. (i.e fruit snacks)
- 2-digit by one factors
- GoMath! Real World Videos
- Assign easier/complex areas and perimeters
- GoMath! STEM Activities
- Regulate the amount of data
- Anchor charts, visuals
- Centers
- Multi-Step problems

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Modifications/Accommodations

- Provide differentiated instruction as needed

- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Open Number Line
- Array
- Line plot
- Scaled Bar Graph
- Scaled Picture Graph
- Ruler (inches)

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy		CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		CRP11. Use technology to enhance productivity.
	Career Preparation		CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Unit 5: Geometry	Duration: May – June, Ongoing
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NJ Student Learning Standard: 3.G	
Unit Summary	
<ul style="list-style-type: none"> Reason with shapes and their attributes. 	
Unit Summary: Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.	

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Motions and Stability, Heredity, Biological Evolution and Earth Systems.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under <i>Teacher Resources</i>)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

A.	Reason with shapes and their attributes.
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.
	NJ Student Learning Standard for Introduction
4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
	Interdisciplinary Skills
SL.3.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
SL.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
	Technology

8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
Essential Understandings	
Essential Questions	
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> Geometric figures are described by their attributes. Attributes of objects can be measured with appropriate tools. 	<ul style="list-style-type: none"> What words in geometry are also used in daily life? Why can different geometric terms be used to name the same shape?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	
Other Assessments	
<p><u>Geometric Manahawkin</u></p> <p>Objective: Students will create their hometown of Manahawkin using geometric shapes.</p> <ul style="list-style-type: none"> Research local businesses, community buildings, churches, housing, ecosystems, landforms, etc. to determine the proper geometric shapes needed. Build three dimensional buildings with the use of Legos, tangrams, cardboard, playdough, or various materials. 	<p>Formative Assessments</p> <ul style="list-style-type: none"> Teacher Observation Performance Assessments Exit Slips Games Anecdotal Records Oral Assessments/Conferencing Portfolio/Math Journals Daily Daily Classwork Pre-assessments

<ul style="list-style-type: none"> • Plan and plot as to where these geometric buildings should be laid out. • Design a descriptive brochure that represents Manahawkin. 	<p>Summative Assessments</p> <ul style="list-style-type: none"> • Go Math Tests • Go Math Quizzes • National/State/District Wide Assessments • EOY Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • Go Math Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Mathematical Practices	
MP 1: Make Sense of Problems and Persevere in Solving Them MP 6: Attend to Precision	
Vocabulary	
area, attribute, category, equal, four, hexagon, large/larger, part, partition, quadrilateral, rectangle, shape, side, unit fraction, whole	

Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> Reason with shapes and their attributes: Chapter 12 <p><i>Students will know...</i></p> <ul style="list-style-type: none"> How spatial relationships can be described by careful use of geometric language How geometric relationships help to solve problems and/or make sense of phenomena 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> Use properties of standard 2-D shapes to identify, classify, and describe (vertex, side, edge, face, and angle) Recognize rhombus, rectangles, and squares as examples of quadrilaterals and determine examples of quadrilaterals that do not belong Partition shapes (unit fractions) into sections to determine parts of a whole Create and describe quadrilaterals Draw shapes with shared attributes Sort shapes by square angles and side lengths Partition shapes into halves, thirds, quarters, sixths, eighths, and arrays Find missing parts of shapes
Instructional Plan	
Suggested Activities	Resources
Geometry Scavenger Hunt: Students will locate and identify shapes in the real world	Paper and pencil or a pre-created worksheet with shape headings
Students will create an illustration using tangrams and templates	Paper, tangrams and templates

Walking Polygons: Students will explore interior angles using their feet	https://www.exploratorium.edu/geometryplayground/Activities/walkingpolygons.php
Students will use real-world logos to locate shapes	Paper and pencil, real world logos
Experimenting with Symmetry- Students will apply transformations and use symmetry to analyze mathematical situations	https://www.sciowa.org/downloads/static/geoplay-experimenting-with-symmetry.pdf Pattern blocks: http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm
Math Literature	
Shapes: <ul style="list-style-type: none"> • <u>When a Line Bends . . . A Shape Begins</u> by Rhonda Gowler • <u>Greene Shapes, Shapes, Shapes</u> by Tanya Hoban • <u>Cubes, Cones, Cylinders, & Spheres</u> by Tanya Hoban • <u>Lines, Segments, Rays, and Angles</u> by Claire Piddick • <u>The Sir Cumference Series</u> by Cindy Neuschwander & Wayne Geehan 	
Websites	
http://www.studyisland.com/	Study Skills
https://www.flocabulary.com/subjects/math/	Educational Hip-Hop Songs and Videos
http://www.mathplayground.com/index_geometry.html	Geometry Games

http://www.factmonster.com	Geometry Games
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Provide a checklist of shapes • Provide logos to locate shapes • Differentiate the shapes used • 2-digit by one factors • Math on the Spot Tutorial • <i>Do The Math</i> Intervention • Small group instruction • Manipulatives 	
English Language Learners <ul style="list-style-type: none"> • 2-digit by one factors • Provide a checklist of shapes • GoMath! Spanish edition • Provide logos to locate shapes • Math on the Spot Tutorial • Bilingual Math Boards • ELL Activity Guide • Differentiate the shapes used • Small group instruction • Manipulatives • Centers • Anchor charts, visuals 	
Gifted & Talented <ul style="list-style-type: none"> • 2-digit by one factors 	

- GoMath! Real World Videos
- Provide logos to locate shapes
- GoMath! STEM Activities
- Provide a checklist of shapes
- Differentiate the shapes used
- Centers
- Anchor charts, visuals
- Multi-step problems

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies



Estell Manor School District

Mathematics Curriculum

Grade 4

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1: Operations and Algebraic Thinking	Approximately 40- 45 Days
Unit 2: Number and Operations in Base Ten	Approximately 40- 45 Days
Unit 3: Number and Operations—Fractions	
Unit : Measurement and Data	Approximately 40- 45 Days
Unit : Geometry	Approximately 40- 45 Days

Core Materials:

GoMath
Do The Math
Linkit

Grade 4 Overview

Operations and Algebraic Thinking

- Use the four operations with whole numbers to solve problems
- Gain familiarity with factors and multiples
- Generate and analyze patterns

Number and Operations in Base Ten

- Generalize place value understanding for multi-digit whole numbers
- Use place value understanding and properties of operations to perform multi-digit arithmetic

Number and Operations - Fractions

- Extend understanding of fraction equivalence and ordering
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- Understand decimal notation for fractions, and compare decimal fractions

Measurement and Data

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit
- Represent and interpret data
- Geometric measurement: understand concepts of angle and measure angles

Geometry

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles

Mathematical Practices

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy			CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.

	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Unit 1: Operations and Algebraic Thinking	Duration: 40 Days (Ongoing)
NJ Student Learning Standard: 4.OA	
Unit Summary <ul style="list-style-type: none"> • Use the four operations with whole numbers to solve problems. • Gain familiarity with factors and multiples. • Generate and analyze patterns. Summary: Students will continue to develop their understanding of the four operations to solve multi-step problems with the emphasis on multiplication to find the product and division to find the factor. By comparing a variety of solution	

strategies, students learn the relationship between multiplication and division. Additional understanding and solutions can be found through the use of groups, arrays and models.

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Energy, Earth and Human Activity and Engineering and Design.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journal, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. Interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

A.	Use the four operations with whole numbers to solve problems.
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
B.	Gain familiarity with factors and multiples.

4.OA.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1– 100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
C.	Generate and analyze patterns.
4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.
	NJ Student Learning Standard for Introduction
5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
	8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge. A. Technology Operations and Concepts: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
	9.1 21st Century Life Skills: All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures. B. Creativity and Innovation: Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.
	Interdisciplinary Skills
SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
	Technology
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
	21st Century Life and Career:

CRP4.	Communicate clearly and effectively and with reason.	
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.	
CRP11.	Use technology to enhance productivity.	
CRP12.	Work productively in teams while using cultural global competence.	
Essential Understandings		Essential Questions
<i>Students will understand that...</i> <ul style="list-style-type: none"> Numbers can be compared abstractly and quantitatively Knowing their multiplication facts can help in real life situations Different symbols are used to compare numbers By identifying patterns helps reinforce facts and develop fluency with operations 		<ul style="list-style-type: none"> How can numbers be expressed, ordered, and compared? How can place value understanding help us with comparing, ordering, and rounding? Why is it important to have quick recall of multiplication and division? What symbols can be used to compare numbers? Why is it important to identify patterns?
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments
<u>Food In Space</u> <i>Student Directions:</i> You need to find out how much food will be needed for the mission to Mars. Use the important facts to create your plan. Find the total number of days. Find the amount of food needed for 1 astronaut for the entire mission. Find the total amount of food needed for all astronauts for the entire mission.		Formative Assessments <ul style="list-style-type: none"> Daily Classwork Teacher Observation Exit slips Games (technology/manipulative-based) Summative Assessments <ul style="list-style-type: none"> GoMath Tests Quizzes

<p><u>Road Trip</u></p> <p><u>Student Directions:</u> Math comes in handy when travelling and shows up in various ways from estimating the amount of fuel you'll need to plan out a trip based on miles per hour and distance traveled. Calculating fuel usage is crucial to long distance travel. Without it, you may find yourself stranded without gas or on the road for much longer than anticipated. You may also use math throughout the trip by paying for tolls, counting exit numbers, checking tire pressure, etc.</p> <p>Start your travels at home and have students map a car route to their final location. They will need to determine how long it will take to get there (based on miles/hr) how much they will need to spend on gas, and how many stops they will need to make.</p>	<ul style="list-style-type: none"> • linkit Assessment a • GoMath BOY Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Mathematical Practice	
<p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.7 Look for and make use of structure.</p>	
Vocabulary	
<p>product, associative property, commutative property, identity property, distributive property, quotient, factors, multiple, prime, composite, array, area model, divisor, dividend</p>	

Knowledge and Skills	
Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> • Use the four operations with whole numbers to solve problems (Chapter 2, 3, 4) • Gain familiarity with factors and multiples (Chapter 5) • Generate and analyze patterns (Chapter 5) <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • How to solve multi-step word problems with whole numbers using the four operations • How to write an algebraic expression • How to find all factor pairs for a whole number less than 100 • How to identify patterns and apply the rule 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Solve multi-step word problems with whole numbers using the four operations • Write an algebraic expression • Find all factor pairs for a whole number less than 100 • Identify patterns and apply rule • Identify and verbalize which quantity is being multiplied and which number tells how many times • Use mental computation and estimation strategies to check the reasonableness of their answer • Determine whether a number is prime or composite • Investigate different patterns to find rules, identify features in the patterns, and justify the reason for those features • Solve multi-step word problems involving multiplication and division of whole numbers • Use an organized procedure to solve word/application problems
Instructional Plan	
Suggested Activities	Resources
Around the world with facts - Students will answer multiplication facts. First, two students pair up and	Flashcards

<p>compete to correctly answer the multiplication fact first. The student with the correct answer moves to pair up with the next student. This process continues until one student moves all around the classroom back to their seat.</p>	
<p>Multiplication War - Students will each evenly share a set of cards with numbers 0 through 12 or playing cards with a partner. Students will each draw two cards from their deck. He/she will multiply their two numbers together. The partner with the larger product wins and collects all four cards. If the students have a tie and have the same product, both students place four cards face down on the table. Then, each student flips over their first two cards and finds the product of those numbers. The person with the higher product wins and collects all cards. If there is a second tie, the student continues to flip over two more cards to find the product. The winner is the person who collects all of the cards.</p>	<p>Playing cards (Ace is 0, Jack is 11, Queen is 12, and King is any number) or cards with numbers 0 through 12</p>
<p>Math Fact Bump - Students will use a multiplication bump board and will roll dice to try to get as many of their pieces on the board as they can. Students roll two dice and multiply the numbers on the dice together. The student then places their game piece on the product of their two dice. Next, the student's partner does the same thing, and they continue to take turns for the given amount of time they have. The student with the most number of pieces on the board wins when the time is up.</p>	<p>Bump Boards, dice (2 six-sided or 2 ten-sided), timer (to set how long students will play with their partner)</p>
<p>Array Boxes - Students will create arrays on graph paper with a partner. One partner will roll two dice and then draw an array on graph paper based on these two numbers. In the middle of their array, they write the product of those two numbers and color in their array in their color. The next partner chooses a different color and follows the same steps. The students can make their arrays touch on the</p>	<p>Graph paper, dice</p>

graph paper. Once the graph paper is full, students count up to see who covered most of the graph paper.	
Fly Swat Multiplication - Students will use fly swatters to correctly answer the multiplication problem first. To assemble this game, products of multiplication problems are written on board. Students will cut all out problem. A player from each team tries to swat answer first. The team that gets the answer correct first gets a point for their team. The team with the most points wins.	2 fly swatters, whiteboard and dry erase marker for displaying products
Kahoot Quizzes - Students will take a Kahoot quiz on multi-step word problems or Place value to practice multi-step word problems or place value skills.	Chromebooks
Money Math - In small groups, students will utilize food store flyers to accomplish different objectives (how many of a certain item can they buy with a given amount of money, buy foods for a party, spend as close to \$25 as possible, etc.). Students will record their word and describe how they used their money to accomplish the given task.	Supermarket flyers, paper for recording results
Math Literature	
<u>Multiplication:</u> <ul style="list-style-type: none"> • <i>Amanda Beans Amazing Dream</i> by: Marilyn Burns • <i>The Best of Times</i> by: Greg Tong • <i>Multiplication Menace</i> by: Pam Calvert • <i>One Grain of Rice</i> by: Demi <u>Patterns:</u> <ul style="list-style-type: none"> • <i>Chasing Vermeer</i> by: Blue Balliet 	
Websites	

https://www-k6.thinkcentral.com/ePC/start.do	Mega Math Games, iTools, Personal Math Trainer, Animated Math Models
https://learnzillion.com/resources/64178-exploring-multiples-and-factors	Learn Zillion
https://www.flocabulary.com/topics/numbers-operations/	Flocabulary
https://www.mathsisfun.com/algebra/index.html	Math is Fun
http://www.studyisland.com/	Study Island
http://www.brainpop.com/math	Brain Pop
http://prodigygame.com	Prodigy
http://www.sheppardsoftware.com/math.htm	Sheppard Software
http://www.aaamath.com/grade4.htm	AAA Math
https://www.ixl.com/math/grade-4	IXL Math
https://www.varsitytutors.com/aplusmath	APlus Math
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-fact-mult-topic	Khan Academy
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-mult-div-topic	Khan Academy
https://www.illustrativemathematics.org/4	Real World Math Word Problems By Standard
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Multiplication tables • Provide a checklist 	

- Response to intervention
- 2 -digit by one factors
- Math on the Spot
- Intensive Intervention
- Provide place value chart
- Anchor charts, visuals
- Manipulatives

English Language Learners

- Multiplication table
- 2-digit by one factors
- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide place value chart
- Anchor chart, visuals
- Manipulatives

Gifted and Talented

- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide Enrich packet
- Multi-step problems
- Student-driven activities, choices

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
- Manipulatives
- Anchor chart, visuals

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Unit 2: Number and Operations in Base Ten	Duration: 60 Days (Ongoing)
NJ Student Learning Standard: 4.NBT	
Unit Summary <ul style="list-style-type: none"> • Generalize place value understanding for multi-digit whole numbers. • Use place value understanding and properties of operations to perform multi-digit arithmetic. <p>Unit Summary: Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.</p>	

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journal, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. Interactive

	whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)
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21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

A.	Generalize place value understanding for multi-digit whole numbers.
4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.
B.	Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
NJ Student Learning Standard for Introduction	
5.NBT.3	Read, write and compare decimals to the thousandths.
SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
Essential Understandings <i>Students will understand that...</i>	
Essential Questions	
<ul style="list-style-type: none"> Place value is based on groups of ten Numbers will represent quantity, position, location, and relationships Estimation is a way to get an approximate answer Computation involves taking apart and combining numbers using a variety of approaches 	<ul style="list-style-type: none"> How can place value properties aid computation? How can numbers be expressed, ordered, and compared? What are strategies to make a reasonable estimate? How do I know when an answer is reasonable? What makes a strategy for computing effective and efficient?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	
Other Assessments	
<u>Dream Vacation</u>	Formative Assessments <ul style="list-style-type: none"> Performance Assessment

<p><u>Student Directions:</u> Using a budget of \$15,000, you get to create your dream vacation. You need to research the hotel cost, travel costs, food, and activities. Make sure not to go over your budget.</p>	<ul style="list-style-type: none"> ● Teacher Observation ● Exit Slips/Slate Assessments ● Games (technology/manipulative-based) ● Pre-assessments ● Anecdotal Records ● Portfolio/Math Journals ● Daily Classwork <p>Summative Assessments</p> <ul style="list-style-type: none"> ● Tests ● Quizzes ● District Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Untimed Fact Practice Assessment ● Manipulative Driven Assessment ● Modified/Teacher Created Chapter Tests ● Modified/Teacher Created Mid-Chapter Quiz ● Visual Representation of Skills Assess ● Modified Classwork Assignments ● Modified Benchmarks ● GoMath Reteach Activities and Worksheets ● Project Based Assessments with Scoring Rubric
<p align="center">Mathematical Practice</p>	

<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.6 Attend to precision</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	
Vocabulary	
numeral, standard form, written form, expanded form, greater than, less than, equal, place of a digit, value of a digit, digit, difference, subtraction, associative property, commutative property, sum, whole number, operations, remainder, estimate, round	
Knowledge and Skills	
Content:	Skills:
<p>Cluster:</p> <ul style="list-style-type: none"> Generalize place value understanding for multi-digit whole numbers (Chapter 1) Use place value understanding and properties of operations to perform multi-digit arithmetic (Chapter 1, 2, 3, and 4) <p><i>Students will know...</i></p> <ul style="list-style-type: none"> That in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> Model the 10-to-1 relationship among place-value positions in the base-ten number system Read and write whole numbers in standard form, word form, and expanded form Compare and order whole numbers based on the values of the digits in each number Round a whole number to any place Rename whole numbers by regrouping

<ul style="list-style-type: none"> • Use place value understanding to round multi-digit whole numbers to any place • Fluently add and subtract multi-digit whole numbers using the standard algorithm 	<ul style="list-style-type: none"> • Add whole numbers and determine whether solutions to addition problems are reasonable • Subtract whole numbers and determine whether solutions to subtraction problems are reasonable • Use the strategy draw a diagram to solve comparison problems with addition and subtraction • Multiply tens, hundreds, and thousands by whole numbers through 10 • Estimate products by rounding and determine if exact answers to multiplication problems are reasonable • Use strategies to multidigit number by a 1-digit number • Read and write multi-digit numbers using numerals, word, and in expanded forms • Recognize that in multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right • Round multi-digit whole numbers • Compare and contrast numbers using various strategies • Create a pattern that follows a given rule • Identify and recognize the 5 multiplication properties and use them to solve equations • Find all factor pairs for a whole number in the range 1-100 • Define the terms: factors and multiples and prime and composite • Fluently multiply and divide whole numbers using the standard algorithms.
Instructional Plan	
Suggested Activities	Resources

Place Value - Students will roll the largest number partner activity	Dice
Place Value Yahtzee- Students roll 2 dice and whoever has the higher number when added together takes the cards for the round.	Dice
Swat It Place Value- Students draw three cards and the first student to swat the highest value card wins this round. Student takes all cards for this round.	Swatters
Place Value Stomp - Index Cards with numbers are laid out on the floor in front of each student. Teacher or student leader names a place value and the student needs to stomp of the place value called and say the number in that place value.	Index cards with numbers
Human Place Value - Have students hold cards and move around and practice reading the number with each place value.	Index cards with numbers
Math Literature	
<u>Multiplication:</u> <ul style="list-style-type: none"> • <i>Amanda Beans Amazing Dream</i> by: Marilyn Burns • <i>The Best of Times</i> by: Greg Tong • <i>Multiplication Menace</i> by: Pam Calvert • <i>One Grain of Rice</i> by: Demi <u>Place Value:</u> <ul style="list-style-type: none"> • <i>How much is a Million?</i> by: David Schwartz • <i>If You Made a Million</i> by: David Schwartz • <i>One Hundred Hungry Ants</i> by: Elinor Pinczes • <i>The King's Commissioners</i> by: Marilyn Burns • <i>The M & M Counting Book</i> • <i>The Math Curse</i> by: Jon Scieszka 	

- *Two Ways to Count to Ten* by: Ryby Dee

Websites

https://www-k6.thinkcentral.com/ePC/start.do	Mega Math Games, iTools, Personal Math Trainer, Animated Math Models
https://www.ixl.com/math/grade-4	IXL Math
https://www.varsitytutors.com/aplusmath/flashcards	APlus Math - Flashcards
https://www.varsitytutors.com/aplusmath/games	APlus Math - Games
http://www.aaamath.com/	AAA Math
http://www.sheppardsoftware.com/math.htm#basicoperations	Sheppard Software
http://www.sheppardsoftware.com/math.htm#placevalue	Sheppard Software Place Value
https://www.flocabulary.com/topics/multiplication-division/	Flocabulary
http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=1024	Rounding Whole Numbers (Number Line)
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-mult-div-topic	Khan Academy
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-place-value-rounding	Khan Academy
https://www.illustrativemathematics.org/4	Real World Math Word Problems By Standard

Suggested Options for Differentiation

Basic Skills/Economically Disadvantaged/Students at Risk

- Multiplication table
- 2-digit by one factors
- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide place value chart
- Anchor charts, visuals
- Manipulatives

English Language Learners

- Multiplication table
- 2-digit by one factors
- GoMath! Spanish edition
- Math on the Spot Tutorial
- Bilingual Math Boards
- ELL Activity Guide
- Anchor charts, visuals
- Manipulatives

Gifted and Talented

- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide Enrich packet
- Anchor charts, visuals
- Multi-step problems
- Student-driven activities/choices

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed

- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Number and Operations in Base Ten	Duration: November – January, Ongoing
NJ Student Learning Standard: 4.NBT	
Unit Summary <ul style="list-style-type: none"> • Generalize place value understanding for multi-digit whole numbers. • Use place value understanding and properties of operations to perform multi-digit arithmetic. <p>Unit Summary: Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.</p>	

Unit 3: Number and Operations-Fractions	Duration: 40 Days (Ongoing)
NJ Student Learning Standard: 4.NF	

Unit Summary

- Extend understanding of fraction equivalence and ordering
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Unit Summary: Students will use their understanding of fractions to recognize the equivalence of a given fraction. They will write fractions in sequential order. Students will demonstrate addition and subtraction of fractional parts using manipulatives and common denominators. They will multiply a fractional part by a whole number. Students make connections between fractions and decimals and also comparing of both fractions and decimals.

Primary Interdisciplinary Connections

Science	measurement (distance, weight, and growth), data analysis and collection
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journal, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers

CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.

CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

A.	Extend understanding of fraction equivalence and ordering.
4.NF.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
4.NF.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
B.	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
4.NF.3	<p>Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.</p> <p>a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p> <p>b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.</p> <p>c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</p>

	d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.				
4.NF.4	<p>Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>a. Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.</p> <p>b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)</p> <p>c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</p>				
C.	Understand decimal notation for fractions, and compare decimal fractions				
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.				
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.				
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.				
SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.				
SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.				
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.				
<table border="1"> <tr> <td>Essential Understandings <i>Students will understand that ...</i></td><td>Essential Questions</td></tr> <tr> <td> <ul style="list-style-type: none"> Fractions and decimals express a relationship between two numbers </td><td> <ul style="list-style-type: none"> How to make a visual representation of a fraction or decimal? </td></tr> </table>		Essential Understandings <i>Students will understand that ...</i>	Essential Questions	<ul style="list-style-type: none"> Fractions and decimals express a relationship between two numbers 	<ul style="list-style-type: none"> How to make a visual representation of a fraction or decimal?
Essential Understandings <i>Students will understand that ...</i>	Essential Questions				
<ul style="list-style-type: none"> Fractions and decimals express a relationship between two numbers 	<ul style="list-style-type: none"> How to make a visual representation of a fraction or decimal? 				

<ul style="list-style-type: none"> Fractions and decimals are parts of whole numbers An improper fraction represents a number greater than one A given mixed number is equivalent to its improper fractions. 	<ul style="list-style-type: none"> How are common fractions and decimals alike and different? How is computation with rational numbers similar and different to whole number computation? How can an improper fraction be expressed as a mixed number?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p style="text-align: center;"><u>Bake Sale</u></p> <p><u>Student Directions:</u> You are planning and baking for a bake sale at your school to raise money for your favorite charity. You are using your favorite recipe, but you need to make enough for the bake sale. Write your original recipe, and then determine how many batches you want to make, how many of each ingredient you will need, and how much time it will take. How much will each item at the sale cost? If you sell all of your goods, how much will you have raised for your charity?</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> Performance Assessment Teacher Observation Exit Slips/Slate Assessments Games (technology/manipulative- based) Pre-assessments Anecdotal Records Oral Assessments/Conferencing Portfolio/Math Journals Daily Classwork <p>Summative Assessments</p> <ul style="list-style-type: none"> Tests Quizzes District Assessments <p>Benchmark Assessment</p>

	<ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Mathematical Practice	
MP.1 Make sense of problems and persevere in solving them MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.6 Attend to precision. MP.8 Look for and express regularity in repeated reasoning.	
Vocabulary	
numerator, denominator, benchmark fractions, whole, equivalent fractions, mixed number, proper fraction, improper fraction, tenth, hundredth	
Knowledge and Skills	
Content	Skills

<p>Cluster:</p> <ul style="list-style-type: none"> • Extend understanding of fraction equivalence and ordering (Chapter 6) • Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers (Chapter 7, 8) • Understand decimal notation for fractions, and compare decimal fractions (Chapter 9) <p><i>Students will know....</i></p> <ul style="list-style-type: none"> • Compare two decimals up to hundredths using the $>$, $<$, and $=$ symbols • Identify the direct relationship between fractions and decimals • Location of decimals on a number line in relation to a fraction 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Make a visual representation of a fraction or decimal • Make computations with fractions • Understand fractions as division of two whole numbers • Read and write symbolic notation for fractions • Identify fractions as part of a whole, part of a set, part of an area, and locations on the number line • Recognize and name equivalent fractions • Order fractions (improper and mixed numbers) • Multiply a unit of fraction (numerator of 1) by a whole number • Multiply a fraction with a numerator greater than one by a whole number • Solve word problems that involve multiplying a fraction by a whole number • Rewrite a fraction that has a denominator of 10 as an equivalent fraction with a denominator of 100 • Rewrite a fraction that has a denominator of 100 as an equivalent fraction with a denominator of 10. Add two fractions with denominators of 10 or 100 • Create a model that depicts a fraction's value • Determine if given fractions are equivalent • Use multiple strategies to identify equivalent fractions • Use symbols ($>$, $<$, $=$) to compare fractions with the same denominator and different numerators • Use benchmark fractions to compare fractions • Use fraction models to add and subtract fractions with like denominators
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	<ul style="list-style-type: none"> • Use fraction models, number lines, and equations to represent word problems • Write a decomposed fraction using an equation
Instructional Plan	
Suggested Activities	Resources
Fraction War Students will draw 2 cards. With these 2 cards, students will make a fraction. Higher fraction takes cards.	Playing cards
Dice roll create largest decimal- Students will roll dice 5 times and create the largest number using a decimal.	Dice
Playdough Fraction Pies- Students create fraction pies by cutting the playdough into equal pieces.	Playdough
Students will use this website: Fractions in Real Life Cooking Webquest, to learn how to convert fractions in real life cooking situations.	Chromebooks http://zunal.com/webquest.php?w=18355
Math Literature	
<u>Fractions:</u> <ul style="list-style-type: none"> • <i>A Melody in Fraction</i> • <i>Sleeping Half the Day Away</i> • <i>The Hershey's Milk Chocolate Fractions Book</i> by: Jerry Pallotta • <i>A Remainder of One</i> by: Elinor Pinczes • <i>Each Orange Had 8 Slices</i> by: Paul Giganti • <i>Little House in the Big Woods</i> by: Laura Ingalls Wilder • <i>Piece = Part = Portion: Fraction = Decimals = Percents</i> by: Scott Gifford • <i>If You Hopped Like a Frog</i> by: David M. Schwartz • <i>Fraction = Trouble</i> by: Claudia Mills 	

Websites	
https://www-k6.thinkcentral.com/ePC/start.do	Mega Math Games, iTools, Personal Math Trainer, Animated Math Models
https://www.flocabulary.com/topics/numbers-operations/	Flocabulary
http://www.aaamath.com/fra.htm	AAA Math
https://www.ixl.com/math/grade-4	IXL Math - Fraction Equivalence and Ordering Add & Subtract Fractions with Like Denominators Add & Subtract Fractions with Unlike Denominators Multiply Fractions
https://www.turtlediary.com/games/fourth-grade/fractions.html	TurtleDiary
http://www.sheppardsoftware.com/math.htm#fractions	Sheppard Software
https://www.brainpop.com/math/	Brain Pop
https://www.prodigygame.com	Prodigy
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-fractions-topic	Khan Academy
https://www.illustrativemathematics.org/4	Real World Math Word Problems By Standard
Suggested Options for Differentiation	

Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Multiplication table • 2-digit by one factors • Go Math! Real World Videos • Go Math! Stem Activities • Provide fraction strips • Manipulatives • Anchor charts, visuals
English Language Learners <ul style="list-style-type: none"> • Multiplication table • 2-digit by one factors • Go Math! Real World Videos • Go Math! Stem Activities • Provide fraction strips • Manipulatives • Anchor charts, visuals
Gifted and Talented <ul style="list-style-type: none"> • Go Math! Real World Videos • Go Math! Stem Activities • Provide Enrich packet • Anchor charts, visuals • Multi-step problems • Student-driven activities/choices
Special Education/504 <ul style="list-style-type: none"> • One on one instruction • Adaptive devices • Provide differentiated instruction as needed • Follow all IEP modifications/504 plan • Provide manipulatives or the opportunity to draw solution strategies • Anchor charts, visuals

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Unit 4 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Measurement and Data	Duration: 40 Days (Ongoing)
NJ Student Learning Standard: 4.MD	
Unit Summary <ul style="list-style-type: none"> • Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data. • Geometric measurement: understand concepts of angles and measure angles. Unit Summary: Students will solve, interpret, and analyze problems involving measurements. The use of a protractor for measurement of degrees is introduced in the grade level and area and perimeter is reviewed. Student will also analyze for plotting.	

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Waves, Earth's Place in the Universe and Earth's Systems.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journal, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.

CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

A.	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...
4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor
B.	Represent and interpret data.
4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.
C.	Geometric measurement: understand concepts of angle and measure angles.

4.MD.5	<p>Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</p> <p>a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one degree angle,” and can be used to measure angles.</p> <p>b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.</p>		
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.		
4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.		
NJ Student Learning Standards for Introduction			
5.MD.3	<p>Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</p> <p>a. A cube with side length 1 unit, called a “unit cube” is said to have “one cubic unit” of volume, and can be used to measure volume.</p> <p>b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.</p>		
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.		
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world mathematical problems involving volume.		
SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.		
SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.		
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.		
<table border="1"> <tr> <td>Essential Understandings <i>Students will understand that ...</i></td><td>Essential Questions</td></tr> </table>		Essential Understandings <i>Students will understand that ...</i>	Essential Questions
Essential Understandings <i>Students will understand that ...</i>	Essential Questions		

<ul style="list-style-type: none"> • Objects have distinct attributes that can be measured • Standard units provide common language for communication measurements • The choice of measurement tools depends on the measurable attribute and the degree of precision desired • Graphs convey data in a concise way 	<ul style="list-style-type: none"> • What types of problems are solved with measurement? • What are the tools of measurement and how are they used? • How do units within a system relate to each other? • When is an estimate more appropriate than an actual measurement? • How can information be gathered, recorded and organized? • What visual aspects of a data display help people understand and interpret information easily?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p style="text-align: center;"><u>Dream House</u></p> <p><u>Student Directions:</u> Create your dream house using graph paper. Write the perimeter and area of each room.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Performance Assessment • Teacher Observation • Exit Slips/Slate Assessments • Games (technology/manipulative-based) • Pre-assessments • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals • Daily Classwork <p>Summative Assessments</p> <ul style="list-style-type: none"> • Tests • Quizzes

	<ul style="list-style-type: none"> District Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Mathematical Practice	
MP.2 Reason abstractly and quantitatively. MP.5 Attend to precision MP.6 Attend to precision. MP.7 Look for and make use of structure.	
Vocabulary	
kilometer, meter, centimeter, kilogram, gram, pound, ounce, milliliter, liter, hour, minute, second, feet, inches, area, perimeter, line plot, bar graph, line graph, protractor, pictograph, polygon, quadrilateral, trapezoid, rhombus, parallelogram, rectangle, square, rectangular prism, cube, sphere, cone, cylinder, rectangular pyramid	
Knowledge and Skills	
Content	Skills

<p>Cluster:</p> <ul style="list-style-type: none"> • Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit (Chapter 12, 13) • Represent and interpret data (Chapter 12) • Geometric measurement: understand concepts of angles and measure angles (Chapter 10, 11) <p><i>Students will know:</i> Use and read a variety of measurement tools, such as thermometers, rulers, tape measures, and scales</p>	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Measure angles using a protractor • Create and analyze tables and graphs to record data • Calculate elapsed time in word problems • Describe temperature with thermometers • Determine length/height with rulers and measuring tapes • Measure weight with variety of scales • Find area of rectangles using formula • Calculate perimeter of polygons • Record with customary and metric units • Communicate measurements • Understand the relationships between and among units • Carry out conversions with units of time and money • Carry out conversions of customary and metric units of length, weight and volume • Convert measurements within a system using a chart • Estimate, measure, compare and order varying units of measurement • Choose appropriate units of measure and justify choice • Choose appropriate tools to measure length, weight and capacity • Measure to collect data to make a fraction line plot • Apply the formulas for area and perimeter in real world and mathematical problems • Solve problems involving various measurement situations
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Instructional Plan	
Suggested Activities	Resources
Students will be given a sheet of paper with different measurements on it. They will have to search the classroom for specific items that match the measurement.	Rulers, tape measure, yardstick
Measuring our World: Students will bring in all different sizes of cardboard boxes (cereal, crackers, oatmeal, etc.). Students will measure the length, width, and height. Then, they can find the area of each side of the box or the volume.	Boxes, rulers
Students will use protractors to construct angles. Students should indicate whether the angles is acute, obtuse, or right, after measuring with the protractor.	Protractors, paper
Students will measure angles on a clock using protractors in a group.	Face clock, protractors
Angle Park - Students will create a playground park using a specific number of right, acute, and obtuse angles. They also need to label these angles.	Paper, ruler, protractor, coloring utensils
Math Literature	
<u>Measurement</u> <ul style="list-style-type: none"> • The Librarian Who Measured the Earth by Kathryn Lasby • How Big is a Foot? by Rolf Myller (length) • Measuring Penny by Loreen Leedy • <i>The Light Princess</i> by: George MacDonald (weight/mass) • <i>Actual Size</i> by: Steve Jenkins (length) • <i>Purple Climbing Days</i> by: Patricia Giff (liquid volume) • <i>Spaghetti and Meatballs</i> by: Marilyn Burns (perimeter and area) 	

Websites	
https://www-k6.thinkcentral.com/ePC/start.do	Mega Math Games, iTools, Personal Math Trainer, Animated Math Models
https://learnzillion.com/resources/57241-4th-grade-measurement-and-data	Learn Zillion
https://www.turtlediary.com/games/fourth-grade/units-of-measurement.html	TurtleDiary
http://www.studyisland.com/	Study Island
http://www.aaamath.com/mea.htm	AAA Math
https://www.brainpop.com/math/	Brain Pop
https://www.ixl.com/math/grade-4	IXL Math - Data & Graphs Units of Measurement Angles
https://www.prodigygame.com	Prodigy
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-measurement-topic	Khan Academy
https://www.flocabulary.com/topics/geometry-measurement/	Flocabulary
https://www.illustrativemathematics.org/4	Real World Math Word Problems By Standard
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • Multiplication table • 2-digit by one factors 	

- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide a ruler
- Provide a paper with angle chart
- Provide peer support
- Manipulatives
- Anchor charts, visuals

English Language Learners

- Multiplication table
- 2-digit by one factors
- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide a ruler
- Provide a paper with angle chart
- Provide peer support
- Anchor charts, visuals
- Manipulatives

Gifted and Talented

- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide Enrich packet
- Multi-step problems
- Student driven activities/choices

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Unit 5: Geometry	Duration: 60 Days (Ongoing)
NJ Student Learning Standard: 4.G	
Unit Summary <ul style="list-style-type: none"> • Draw and identify lines and angles, and classify shapes by properties of their lines Unit Summary: Students will use their knowledge of geometric shapes to develop understanding of lines and angles. They will classify two-dimensional shapes according to their properties.	

Primary Interdisciplinary Connections	
Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to Molecules to Organisms.
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journal, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature (see list under Teacher Resources)
Technology	Standard 8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps (see list under Teacher Resources)

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

A.	Draw and identify lines and angles, and classify shapes by properties of their lines and angles
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Essential Understandings <i>Students will understand that ...</i>	Essential Questions
<ul style="list-style-type: none"> • Geometry and spatial sense offer ways to interpret and reflect on our physical environment • Analyzing geometric relationships develops reasoning and justification skills 	<ul style="list-style-type: none"> • How can understanding geometric vocabulary assist with drawing points, lines, line segments, rays, and angles? • How do geometric relationships help us solve problems? • Why is it helpful to classify things like angles or shapes? • How are geometric shapes and objects classified?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p style="text-align: center;"><u>Quilting Bee</u></p> <p><u><i>Student Directions:</i></u> Make your own pattern for a quilt. Include a pair of parallel line segments, a pair of perpendicular line segments, two kinds of quadrilaterals, and an obtuse triangle. Include any other shapes you choose. Explain your pattern in words.</p> <p style="text-align: center;"><u>Landscape Architects</u></p> <p><u><i>Student Directions:</i></u> Decide on the features for your city garden. Imagine yourself sitting in the garden. What things would you like to be able to see? Write the number of square units that you think you will use for each feature. Use the grid to make a map of your garden. Put the measurement of each item in the garden. Label each feature on the grid.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Performance Assessments • Teacher Observation • Exit Slips/Slate Assessments • Games (technology/manipulative-based) • Pre-assessments • Anecdotal Records • Oral Assessments/Conferencing • Portfolio/Math Journals • Daily Classwork <p>Summative Assessments</p>

	<ul style="list-style-type: none"> • Tests • Quizzes • District Assessments • EOY Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Mathematical Practice	
MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure	
Vocabulary	
protractor, point, line, line segment, ray, angle, acute angle, obtuse angle, right angle, straight angle, complementary angles, supplementary angles, perpendicular, parallel, symmetry, endpoint, rotation, scalene triangle, isosceles triangle,	

equilateral triangle, right triangle, polygon, quadrilateral, trapezoid, rhombus, parallelogram, rectangle, square, rectangular prism, cube, sphere, cone, cylinder, rectangular pyramid	
Knowledge and Skills	
Content:	Skills:
<p>Cluster:</p> <ul style="list-style-type: none"> • Draw and identify lines and angles, and classify shapes by properties of their lines and angles (Chapter 10) <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • How to draw and classify points, lines, line segments, rays, and angles with the appropriate tools • The difference between parallel and perpendicular lines. • How to identify symmetry in a two-dimensional shape. 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Explain the difference between parallel and perpendicular lines • Identify symmetry in a two-dimensional shape • Draw and classify points, lines, line segments, rays, and angles with appropriate tools • Identify that two lines are perpendicular when they intersect in right angles • Identify and describe symmetry in two-dimensional geometric shapes • Identify two dimensional geometric shapes based on their properties • Identify, classify, describe, and create 2D figures (square, triangle, and quadrilaterals, hexagon, octagon) according to the measure of their sides and angles • Recognize a line of symmetry for a 2D figure • Identify and classify triangles by their sides and angles (right, obtuse, acute, scalene, equilateral, isosceles) • Investigate 2D and 3D geometric shapes from different perspectives and their attributes (e.g, bases, faces) • Identify line segments, rays, and lines as perpendicular, intersecting, and parallel

	<ul style="list-style-type: none"> Identify, classify, and draw acute, right, and obtuse angles and relate them to the real- world examples
Instructional Plan	
Suggested Activities	Resources
Students will use pattern blocks to demonstrate lines of symmetry by tracing patterns on a sheet of paper and drawing lines to indicate lines of symmetry.	Pattern blocks, paper
Students will demonstrate their understanding of angles by identifying types of angles in their classroom and replicating them with toothpick or popsicle sticks. Students will glue the replicated angle on construction paper and label which type of angle it is and where in the classroom they found it.	Popsicle sticks or toothpicks, construction paper, glue
Students will take turns being "Simon" in the game Simon says. Students will be listening carefully to directions and creating specific angles with specific body parts.	Prior knowledge of angles
Students will use paper and create polygons of their choice. Challenge students to see how many lines of symmetry they can create.	Paper, markers
Students will use a geoboard to demonstrate their understanding of lines and polygons. Students will be asked to create specific shapes, lines, and patterns.	http://www.lauracandler.com/filecabinet/math/PDF/geoideas.pdf Geoboards, rubber bands
Angle Name Writing: Have students write their name in print using capital letters on graph paper. Students will measure the angles between the lines for each of the letters in their name.	Graph paper, pencils, protractors

http://www.rundesroom.com/2016/06/5-activities-for-teaching-angles.html?utm_source=bloglovin.com&utm_medium=feed&utm_campaign=Feed:+blogspot/torar+(Runde's+Room) (example)	
Angle Scavenger Hunt: Students can hunt around the classroom or school and measure the angles they see. Students could also hunt and measure angles to find a specific measure of your choice.	Protractors, note recording sheet
Have students use a ruler as their line of symmetry. Then, students can use pattern blocks to create a symmetric shape with the ruler as their line of symmetry in the middle.	Ruler, pattern blocks
Math Literature	
<u>Shapes</u> <ul style="list-style-type: none"> • <i>The Greedy Triangle</i> by: Marilyn Burns • <i>Three Pigs, One Wolf, and Seven Magic Shapes</i> by: Grace Maccarone • <i>Shape Up!</i> By: David A. Adler • <i>Ed Emberley's Picture Pie: A Circle Drawing Book</i> by: Ed Emberley • <i>Shadows and Reflections</i> by: Tana Hoban • <i>Castle</i> by: David Macaulay • <i>Sir Cumference and the Great Knight of Angleland</i> by: Cindy Neuschwander • <i>Mummy Math: An Adventure in Geometry</i> by: Cindy Neuschwander <u>Lines</u> <ul style="list-style-type: none"> • <i>The Dot and the Line</i> by: Norton Juster • <i>Spaghetti and Meatballs</i> by: Marilyn Burns • <i>Grandfather Tang's Story</i> by: Ann Tappert • <i>The Straight Line Wonder</i> by: Mem Rox • <i>There's No Place Like Space</i> by: Tish Rabe • <i>Straight Lines, Parallel Lines, Perpendicular Lines</i> by: Mannis Charosh 	
Websites	

https://www-k6.thinkcentral.com/ePC/start.do	Mega Math Games, iTools, Personal Math Trainer, Animated Math Models
https://www.khanacademy.org/math/cc-fourth-grade-math/cc-4th-geometry-topic	Khan Academy
http://www.sheppardsoftware.com/mathgames/menus/geometry.htm	Sheppard Software
https://www.turtlediary.com/games/fourth-grade/geometry.html	TurtleDiary - Geometry Games
https://www.flocabulary.com/topics/geometry-measurement/	Flocabulary
https://www.ixl.com/math/grade-4	IXL Math - Two-dimensional & Three-dimensional Figures Triangles and Quadrilaterals Symmetry & Angles
http://www.studyisland.com/login	Study Island
http://www.aaamath.com/geo.htm	AAA Math
https://www.brainpop.com/math/	Brain Pop
https://www.varsitytutors.com/aplusmath/geometry	APlus Math
https://www.prodigygame.com	Prodigy
https://www.illustrativemathematics.org/4	Real World Math Word Problems By Standard
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk	

- Multiplication table
- 2-digit by one factors
- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide students with examples of angles
- Provide students with rulers to help write the letters in their name
- Provide the student will a list of angles they can use
- Limit the number of patterns blocks students use for beginning learners
- Manipulatives
- Anchor charts, visuals

English Language Learners

- Multiplication table
- 2-digit by one factors
- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide students with examples of angles
- Provide students with pictures and examples of each angle to help them create each angle if needed
- Provide the student will a list of angles they can use
- Manipulatives
- Anchor charts, visuals

Gifted and Talented

- Go Math! Real World Videos
- Go Math! Stem Activities
- Provide Enrich packet
- Multi-step problems
- Student-driven activities and choices

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed

- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies



Estell Manor School District

Mathematics Curriculum Grade 5

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop “processes and proficiencies” through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable

students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1 Operations and Algebraic Thinking	Approximately 15 Days
Unit 2 Number and Operations in Base Ten	Approximately 75 Days
Unit 3 Number and Operations - Fractions	Approximately 45 Days
Unit 4 Measurement and Data	Approximately 25 Days
Unit 5 Geometry	Approximately 15 Days

Primary Interdisciplinary Connections: Science, Social Studies, Language Arts, Technology, and 21st Century Life and Careers. For further clarification see New Jersey Student Learning Standards at <http://www.nj.gov/education/cccs/>

Grade 5 Overview

Operations and Algebraic Thinking

- Write and interpret numerical expressions.
- Analyze patterns and relationships.

Number and Operations in Base Ten

- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

Number and Operations- Fractions

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data

- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Geometry

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

Mathematical Practices

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none"> ● What is the problem asking? ● How will you use that information? ● What other information do you need? ● Why did you choose that operation? ● What is another way to solve that problem? ● What did you do first? Why? ● What can you do if you don't know how to solve a problem? ● Have you solved a problem like this one? ● When did you realize your first method would not work? ● How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none"> ● What is a situation that could be represented by this equation? ● What operation did you use to represent the situation ● Why does that operation represent the situation? ● What properties did you use to find the answer? ● How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none"> ● Will that method always work? ● How do you know? ● What do you think about what the other student said?

	<ul style="list-style-type: none"> • Who can tell us about a different method? • What do you think will happen if ...? • When would that not be true? • Why do you agree/disagree with what the other student said? • What do you want to ask the other student about that method? • How does that drawing support your work?
Practice 4: Model with mathematics	<ul style="list-style-type: none"> • Why is that a good model for this problem? • How can you use a simpler problem to help you find the answer? • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer? • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
MP #1	Made sense of problems, evaluated approaches, and persevere in solving them.	Made sense of problems and persevere in solving them.	Made sense of problems.	With support, made sense of problems.
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	Constructed viable arguments and critique the reasoning of others.	Constructed viable arguments.	Compared arguments.
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.

MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and details when calculating and communicating. Examined details of claims and made explicit use of definitions.	Attends to precision and details when calculating and communicating.	Where accurate when calculating and communicating.	Where clear when calculating and communicating.
MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns to solve problems.	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and express regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Operations and Algebraic Thinking	Duration: Approximately 15 Days
NJ Student Learning Standard: 5.OA	
Unit Summary <ul style="list-style-type: none"> • Write and interpret numerical expressions. • Analyze patterns and relationships. Unit Summary: Students will use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. They will write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. They will generate two numerical patterns using two given rules, identify apparent relationships between corresponding terms, form ordered pairs consisting of corresponding terms from, form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	

21st Century Themes	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

5.OA.A.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
5.OA.A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.
5.OA.B.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. <i>For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i>
	NJ Student Learning Standards for Introduction
6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
6.EE.A.2A	Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$.s.
	<p>8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p>A. Technology Operations and Concepts: The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.</p>

	<p>9.1 21st Century Life Skills: All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures.</p> <p>B. Creativity and Innovation: Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.</p>	
SL.5.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.	
SL.5.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.	
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.	
Essential Understandings		Essential Questions
<p>Students will understand that...</p> <ul style="list-style-type: none"> Any number, measure, numerical or algebraic expression, or equation can be represented in a variety of ways that have the same value. The four operations are interrelated, and the properties of each may be used to understand the others. 		<ul style="list-style-type: none"> How are numerical expressions written and interpreted? What are ways to analyze patterns to identify relationship? In what order must operations be evaluated to find the solution of a problem?
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Other Assessments
<ul style="list-style-type: none"> Create a coordinate town 		Formative Assessments <ul style="list-style-type: none"> Oral Questioning

- Mathematical Me project using order of operations equations

- Partners
- Student Conference
- Self-Assessment
- Think-Pair-Share
- Hand Signals
- Peer Reflections
- Constructive Response
- Teacher Observation
- Exit Slip
- Class work
- Math journals

Summative Assessments

- Quizzes
- Tests
- Unit Projects
- Presentations
- District Benchmarks
- State Assessment

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess

	<ul style="list-style-type: none"> • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Distributive Property Numerical Expression Evaluate Order of Operations	
Knowledge and Skills	
Content	Skills
<p>Write and interpret numerical expressions.</p> <p>Analyze patterns and relationships.</p> <p>Students will know...</p> <ul style="list-style-type: none"> • How to write and interpret numerical expressions. • How to analyze patterns and relationships. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Use properties of operations to solve problems • Use order of operations to solve problems • Write and graph ordered pairs on a coordinate grid
Instructional Plan	
Suggested Activities	Resources
<p>Grab and Go Centers</p> <ul style="list-style-type: none"> • Blue activity card 11, A Drive Through History 	1.3, 1.10, 1.11, 1.12, 9.5, 9.6, 9.7

<ul style="list-style-type: none"> • Purple activity card 11, A Drive Through History, What's Left • Blue activity card 15, A Drive Through History • Orange activity card 19, Graphing Practice, It's a Toss Up 	
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • PBL • Enrichment Lesson • Presentation <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase • Understand Context • Scaffold Language • Restate • Cooperative Grouping <p>Special Education/504</p> <ul style="list-style-type: none"> • One on one instruction • Adaptive devices 	

- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Websites

Interactive arithmetic lessons	www.aaamath.com
Online resources	https://www.education.com/resources/fifth-grade/math/
Online videos	www.flocabulary.com
Interactive games	www.kahoot.com
Games, powerpoint, instructional aides	http://internet4classrooms.com/

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.

	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: Number and Operations in Base Ten	Duration: Approximately 75 Days
NJ Student Learning Standard: 5.NBT	
Unit Summary <ul style="list-style-type: none"> Perform operations with multi-digit whole numbers and with decimals to hundredths. Understand the place value system Unit Summary: Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals, fractions and percents, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to	

understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

21st Century Themes	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.
5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
5.NBT.A.3	Read, write, and compare decimals to thousandths.
5.NBT.A.3.A	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (\frac{1}{10}) + 9 \times (\frac{1}{100}) + 2 \times (\frac{1}{1000})$.
5.NBT.A.3.B	Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

5.NBT.A.4	Use place value understanding to round decimals to any place.
5.NBT.B.5	Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
5.NBT.B.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	NJ Student Learning Standards for Introduction
6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
6.NS.C.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
SL.5.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
SL.5.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.

8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
Essential Understandings	Essential Questions
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • numeric fluency includes both the understanding of and the ability to appropriately use numbers • Computational fluency includes understanding not only the meaning, but also the appropriate use of numerical operations and place value. • Formulate, represent and use algorithms to add, subtract, multiply and divide whole numbers, decimals and percents with accuracy and efficiency. • The magnitude of numbers affects the outcome of operations on them. 	<ul style="list-style-type: none"> • How can place value understanding help us compare, order, and round whole numbers and decimals? • How can we apply and extend previous understandings of adding and subtracting decimals? • What algorithms are used to easily multiply and divide whole numbers and decimals? • How can we decide what operation to use when presented with a problem? • How can you describe the relationship between two place value positions? • How do you read, write and represent numbers?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p>Go Math Review Project: The Forester B7</p> <p>Go Math Review Project: Chef's Kitchen B1 (division)</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Partners

- Student Conference
- Self-Assessment
- Think-Pair-Share
- Hand Signals
- Peer Reflections
- Constructive Response
- Teacher Observation
- Exit Slip
- Class work

Summative Assessments

- Quizzes
- Tests
- Unit Projects
- Presentations
- District Benchmarks
- State Assessment

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess
- Modified Classwork Assignments

	<ul style="list-style-type: none"> • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Period Base Exponents Inverse Operations Quotient Dividend Divisor Quotient Remainder Inverse Operations Partial Quotients Compatible Numbers Estimates Thousandths Hundredths Tenths Place Value Round Benchmark Sequence Term Decimal Multiplication Ones Pattern Product Expanded Form Decimal Decimal Point Exponent Equivalent Fractions	
Knowledge and Skills	
Content	Skills
Understand the place value system. Perform operations with multi-digit whole numbers and with decimals to hundredths. Students will know... <ul style="list-style-type: none"> • To understand the place value system to the thousandths. • How to perform operations with multi-digit whole numbers and with decimals to hundredths. 	Students will be able to ... <ul style="list-style-type: none"> • Multiply multi-digit numbers and decimals • Divide and estimate quotients using whole numbers • Compare, round, add and subtract decimal to the thousandths place • Divide Decimals
Instructional Plan	
Suggested Activities	Resources

<p>Grab and Go Centers:</p> <ul style="list-style-type: none"> • Orange/Purple activity cards 1 • Orange activity card 4, Dewey and His Decimals • Blue activity card 4, Doubling Everyday • Purple activity card 11, A Drive Through History • Blue/Orange activity cards 11 • Orange activity card 13, Doubling Everyday • Purple/Blue/Orange activity cards 5 • Blue activity card 15, Niagara Falls Numbers, What's Left • Orange/Blue activity cards 17 <p>Create place value Styrofoam cups SCOOT game for place value</p>	<p>1.1, 1.2, 1.4-1.9, Chapter 2, Chapter 3, Chapter 4, Chapter 5</p>
Websites	
<p>Interactive arithmetic lessons Online resources Online videos Interactive games Games, powerpoint, instructional aides</p>	<p>www.aaamath.com https://www.education.com/resources/fifth-grade/math/ www.flocabulary.com www.kahoot.com http://internet4classrooms.com/</p>
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives 	

- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- PBL
- Enrichment Lesson
- Presentation

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies
-

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Number and Operations-Fractions	Duration: Approximately 45 Days
NJ Student Learning Standard: 5.NF	
Unit Summary <ul style="list-style-type: none"> • Use equivalent fractions as a strategy to add and subtract fractions. • Apply and extend previous understandings of multiplication and division to multiply and divide fractions. <p>Unit Summary: Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)</p>	

21st Century Themes	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

5.NF.A.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like
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	denominators. <i>For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)</i>
5.NF.A.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. <i>For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.</i>
5.NF.B.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <i>For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</i>
5.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
5.NF.B.4A	Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. <i>For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)</i>
5.NF.B.4B	Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.NF.B.5	Interpret multiplication as scaling (resizing), by:
5.NF.B.5.A	Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.given number in a specified set makes an equation or inequality true
5.NF.B.5.B	Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case);

	explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.		
5.NF.B.5.B.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.		
5.NF.B.5.B.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions, such inequalities on number line diagrams.		
5.NF.B.5.B.7.A	Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. <i>For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.</i>		
5.NF.B.5.B.7.B	Interpret division of a whole number by a unit fraction, and compute such quotients. <i>For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.</i>		
5.NF.B.5.B.7.C	Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$-cup servings are in 2 cups of raisins?</i>		
	NJ Student Learning Standard for Introduction		
6.RP	Students' prior knowledge of and skill with multiplication, division and fractions contribute to their study of ratios, proportional relationships and unit rates.		
SL.5.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.		
SL.5.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.		
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Essential Understandings</td> <td style="width: 50%; padding: 5px;">Essential Questions</td> </tr> </table>		Essential Understandings	Essential Questions
Essential Understandings	Essential Questions		

<p>Students will understand that...</p> <ul style="list-style-type: none"> Fractions, decimals, and percentages express the relationship between two numbers. Fractions are a part of a whole, part of a set, part of an area, and locations on the number line. Fractions can be read, written, ordered, compared, modeled, and computed in a variety of ways, including equivalents, improper, and mixed numbers. 	<ul style="list-style-type: none"> How can fractions be modeled, compared, and ordered? How are common fractions and decimals alike and different? How is computation with rational numbers similar and different to whole number computation? How can you make reasonable estimates of fraction sums, differences, products and quotients? How can you add, subtract, multiply and divide fractions?
<p align="center">Evidence of Student Learning</p>	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p align="center">Other Assessments</p>
<p>Go Math: Review Project Designing Backpacks (B11) Literature Recipe Project Card Recipe Project (see attached)</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> Oral Questioning Partners Student Conference Self-Assessment Think-Pair-Share Hand Signals Peer Reflections Constructive Response Teacher Observation Exit Slip Class work

	<p>Summative Assessments</p> <ul style="list-style-type: none"> • Quizzes • Tests • Unit Projects • Presentations • District Benchmarks • State Assessment • National/State/District Wide Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	

Sum, Difference, Benchmark, Common Denominator, Common Multiples, Equivalent Fractions, Simplest Form, Mixed Numbers Denominator Numerator Product Dividend Fraction Quotient Whole Number Equation	
Knowledge and Skills	
Content	Skills
<p>Use equivalent fractions as a strategy to add and subtract fractions.</p> <p>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</p> <p>Students will know how...</p> <ul style="list-style-type: none"> • To use equivalent fractions as a strategy to add and subtract fractions. • To apply and extend previous understandings of multiplication and division to multiply and divide fractions. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Add and subtract fractions/mixed numbers • Multiply fractions/mixed numbers • Divide Fractions
Instructional Plan	
Suggested Activities	Resources
<p>Grab and Go Centers:</p> <ul style="list-style-type: none"> • Orange/Blue/Purple activity cards 8 • Blue/Orange activity cards 6 • Literature 6, Cranking Out the Numbers 	Chapter 6, Chapter 7, Chapter 8

Websites	
Interactive arithmetic lessons Online resources Online videos Interactive games Games, powerpoint, instructional aides	www.aaamath.com https://www.education.com/resources/fifth-grade/math/ www.flocabulary.com www.kahoot.com http://internet4classrooms.com/
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • PBL • Enrichment Lesson • Presentation <p>ELL</p>	

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Measurement and Data	Duration: Approximately 25 Days
NJ Student Learning Standard: 5.MD	
Unit Summary <ul style="list-style-type: none"> • Convert like measurement units within a given measurement system. Represent and interpret data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Unit Summary: Students will apply their understanding of measurement to convert to like units. Students will be able to represent and interpret data through the use of surveys, plots, and graphs.	

21st Century Themes	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
5.MD.B.2	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. <i>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</i>
5.MD.C.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
5.MD.C.3.A	A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
5.MD.C.3.B	A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
5.MD.C.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD.C.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.				
5.MD.C.5.A	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.				
5.MD.C.5.B	Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.				
5.MD.C.5.C	Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.				
NJ Student Learning Standard for Introduction					
6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.				
SL.5.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.				
SL.5.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.				
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.				
<table border="1"> <tr> <td>Essential Understandings</td><td>Essential Questions</td></tr> <tr> <td> Students will understand that... <ul style="list-style-type: none"> They will build on their prior knowledge of related </td><td> <ul style="list-style-type: none"> What types of problems are solved with measurement and what tools would be used? </td></tr> </table>		Essential Understandings	Essential Questions	Students will understand that... <ul style="list-style-type: none"> They will build on their prior knowledge of related 	<ul style="list-style-type: none"> What types of problems are solved with measurement and what tools would be used?
Essential Understandings	Essential Questions				
Students will understand that... <ul style="list-style-type: none"> They will build on their prior knowledge of related 	<ul style="list-style-type: none"> What types of problems are solved with measurement and what tools would be used? 				

<p>measurement units to determine equivalent measurements.</p> <ul style="list-style-type: none"> • Prior to making actual conversions, they examine the units to be converted, determine if the converted amount will be more or less units than the original unit, and explain their reasoning. • They use several strategies to convert measurements. When converting metric measurement, students apply their understanding of place value and decimals. 	<ul style="list-style-type: none"> • How do units within a system relate to each other? • When is an estimate more appropriate than an actual measurement? • How can you compare and convert customary and metric units of length, capacity, and weight? • How can you identify, describe, and classify three-dimensional figures? • How can you find the volume of a rectangular prism using a formula?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p>Go Math Review Project: A Space Capsule Critical Area: Develop an understanding of volume</p> <p>Go Math Review Project: Space Architecture (volume) B5</p> <p>Measurement Scavenger Hunt- Indoor Activities</p> <p>Measurement Chain- Who Has? I Have?</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflections • Constructive Response • Teacher Observation • Exit Slip • Class work <p>Summative Assessments</p>

	<ul style="list-style-type: none"> • Quizzes • Tests • Unit Projects • Presentations • District Benchmarks • State Assessment <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
<p>Data Line Plot Foot Inch Mile Yard Capacity Cup Fluid Ounce Gallon Pint Quart Ounce Pound Ton Weight Dekameter Centimeter Decimeter Gram Kilogram Kilometer Liter Mass Meter Milligram Milliliter Millimeter</p> <p>Elapsed Time Base Decagonal Prism Hexagonal Prism Lateral Face Octogonal Prism Pentagonal Prism Pentagonal Pyramid Polyhedron Prism Pyramid Unit Cubed Cubic Unit Volume</p>	

Knowledge and Skills	
Content	Skills
<p>Convert like measurement units within a given measurement system. Represent and interpret data.</p> <p>Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</p> <p>Students will know...</p> <ul style="list-style-type: none"> the difference between various standard units of measurement how to create visual displays of data how to recognize and apply concepts related to volume 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> Use and create a line plot to find the average in a set of data Compare and convert Customary Units and Metric of capacity, length, and weight Investigate and measure volume and relate it to multiplication and division and solve real world problems Identify, describe and classify 3D figures
Instructional Plan	
Suggested Activities	Resources
<p>Grab and Go Centers:</p> <ul style="list-style-type: none"> Blue/Orange Activity Card 6 Blue/Orange/Purple Activity Card 2 Literature, A Math Mix-Up Game-2 Steps Forward, 1 Step Back/ Blue/Orange Activity Cards 12 Blue/Orange Activity Cards 14 <p>Metric Conversions Metric Song and Capacity Song by Numbers Rock</p> <p>Literature: "Meet the Meters"</p>	<p>9.1, Chapter 10, 11.4, 11.5, 11.6, 11.7 11.8, 11.9, 11.10, 11.11</p>

Websites	
Interactive arithmetic lessons Online resources Online videos Interactive games Games, powerpoint, instructional aides	www.aaamath.com https://www.education.com/resources/fifth-grade/math/ www.flocabulary.com www.kahoot.com http://internet4classrooms.com/
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • PBL • Enrichment Lesson • Presentation <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase • Understand Context • Scaffold Language • Restate 	

- Cooperative Grouping
- Special Education/504
- One on one instruction
 - Adaptive devices
 - Provide differentiated instruction as needed
 - Follow all IEP modifications/504 plan
 - Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.

X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 5: Geometry	Duration: Approximately 15 Days
NJ Student Learning Standard: 5.G	
<p>Unit Summary</p> <ul style="list-style-type: none"> • Graph points on the coordinate plane to solve real-world and mathematical problems. • Classify two-dimensional figures into categories based on their properties. <p>Unit Summary: Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language with increasing precision (i.e. coordinate system, coordinate plane, first quadrant, points, lines, points, lines, axis/axes, x-axis, y-axis, horizontal, vertical, intersection of lines, origin, ordered pairs, coordinates, x-coordinate, y- coordinate). They reference real-world and mathematical problems, including the traveling from one point to another and identifying the coordinates of missing points in geometric figures. Mathematically proficient students also classify two-dimensional figures based on their properties.</p>	

21st Century Themes	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

5.G.A.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
5.G.A.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
5.G.B.4	Classify two-dimensional figures in a hierarchy based on properties.
	NJ Student Learning Standard for Introduction
6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
SL.5.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.

SL.5.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
Essential Understandings	Essential Questions
<i>Students will understand that...</i> <ul style="list-style-type: none"> • coordinate geometry can be used to represent and verify geometric/algebraic relationships • Geometric properties can be used to construct geometric figures. 	<ul style="list-style-type: none"> • How can geometric/algebraic relationships best be represented and verified? • How do geometric relationships help us to solve problems and/or make sense of phenomena?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
	Formative Assessments <ul style="list-style-type: none"> • Oral Questioning • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflections • Constructive Response • Teacher Observation

	<ul style="list-style-type: none"> • Exit Slip • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Quizzes • Tests • Unit Projects • Presentations • District Benchmarks • State Assessment <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	

Congruent Heptagon Nonagon Polygon Regular Polygon Decagon Hexagon Octagon Pentagon Quadrilateral Equilateral Triangle Isosceles Triangle Scalene Triangle Acute Triangle Obtuse Triangle Right Triangle Ordered Pair X/Y Coordinate X/Y Axis Degrees Fahrenheit Interval Line Graph Scale	
Knowledge and Skills	
Content	Skills
Graph points on the coordinate plane to solve real-world and mathematical problems. Classify two-dimensional figures into categories based on their properties. Students will know... <ul style="list-style-type: none"> • how to classify two-dimensional figures • that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category 	Students will be able to ... <ul style="list-style-type: none"> • Classify and Identify polygons • Identify and plot points on a coordinate grid • Use a line graph to analyze real world data
Instructional Plan	
Suggested Activities	Resources
Grab and Go Centers: <ul style="list-style-type: none"> • Blue/Purple activity cards 16 • Blue activity card 20 • Purple/Orange activity cards 19 Literature: <ul style="list-style-type: none"> • Greedy Math Triangle Geoboards for polygons Polygon SCOOT	9.2, 9.3, 9.4 11.1, 11.2, 11.3

Grandfather's Tang Story with tangrams	
Websites	
Interactive arithmetic lessons Online resources Online videos Interactive games Games, powerpoint, instructional aides	www.aaamath.com https://www.education.com/resources/fifth-grade/math/ www.flocabulary.com www.kahoot.it www.internet4classrooms.com
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • PBL • Enrichment Lesson • Presentation <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase • Understand Context • Scaffold Language 	

- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies



Estell Manor School District

Mathematics Curriculum Grade 6

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1 Ratios	Approximately 40 Days
Unit 2 The Number System	Approximately 45 Days
Unit 3 Expressions and Equations	Approximately 50 Days
Unit 4 Geometry	Approximately 20 Days
Unit 5 Statistics and Probability	Approximately 15 Days

Primary Interdisciplinary Connections: Science, Social Studies, Language Arts, Technology, and 21st Century Life and Careers. For further clarification see New Jersey Student Learning Standards at <http://www.nj.gov/education/cccs/>

Grade 6 Overview

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none">• What is the problem asking?• How will you use that information?• What other information do you need?• Why did you choose that operation?• What is another way to solve that problem?• What did you do first? Why?• What can you do if you don't know how to solve a problem?• Have you solved a problem like this one?• When did you realize your first method would not work?• How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none">• What is a situation that could be represented by this equation?• What operation did you use to represent the situation?• Why does that operation represent the situation?• What properties did you use to find the answer?• How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none">• Will that method always work?• How do you know?• What do you think about what the other student said?• Who can tell us about a different method?• What do you think will happen if ...?• When would that not be true?• Why do you agree/disagree with what the other student said?• What do you want to ask the other student about that method?• How does that drawing support your work?
Practice 4: Model with mathematics	<ul style="list-style-type: none">• Why is that a good model for this problem?• How can you use a simpler problem to help you find the answer?

	<ul style="list-style-type: none"> • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer? • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
MP #1	Made sense of problems, evaluated approaches,	Made sense of problems and persevere	Made sense of problems.	With support, made sense of problems.

	and persevere in solving them.	in solving them.		
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	Constructed viable arguments and critique the reasoning of others.	Constructed viable arguments.	Compared arguments.
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.
MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and details when calculating and communicating. Examined details of claims and made explicit use of definitions.	Attends to precision and details when calculating and communicating.	Where accurate when calculating and communicating.	Where clear when calculating and communicating.

MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns to solve problems.	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and expressed regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Ratios	Duration: Approximately 40 Days
NJ Student Learning Standard: 6.RP	
Unit Summary <ul style="list-style-type: none"> Understand ratio concepts and use ratio reasoning to solve problems Unit Summary: Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus, students expand the scope of problems for which	

they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
6.RP.A.2	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger." ¹

6.R.P.A.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams.
6.R.P.A.3a	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
6.R.P.A.3b	Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
6.RP.A.3c	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
6.RP.A.3d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
NJ Student Learning Standards for Introduction	
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.
7.RP.A.2.B	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
8.1 Educational Technology:	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
A. Technology Operations and Concepts	The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.1 21st Century Life Skills:	All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures.
B. Creativity and Innovation:	Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.

SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	Essential Questions
<p><i>Students will understand that....</i></p> <ul style="list-style-type: none"> • A ratio is a special relationship between two quantities where for every x units of one quantity there are y units of another • In a proportional relationship there are an infinite number of ratios equal to the lowest terms or constant ratio. Equal ratios can be found by multiplying both terms by the same non-zero number. • A unit rate is a rate that compares a quantity to one unit of another quantity. • A formula is a common relationship between quantities expressed as an equation. • A special proportional relationship involves distance (d), rate (r), and time (t). The formula showing this relationship is $d = r \times t$. • Rates are easily compared when each is expressed as a unit rate. 	<ul style="list-style-type: none"> • What are ratios and rates, and how are they used in solving problems? • What is a proportion, and what role does a ratio play in a proportion? • How can you use ratios to express relationships and solve problems? • How can you use ratio reasoning to solve percent problems? • How can you use measurements to help you describe and compare objects?
Evidence of Student Learning	
<p>Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.</p>	Other Assessments
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning

- Choral Response
- Partners
- Student Conference
- Self-Assessment
- Think-Pair-Share
- Hand Signals
- Peer Reflection
- Graphic Organizers
- Constructive Response
- Teacher Observation Exit Card Tickets
- Class work

Summative Assessments

- Chapter Tests
- Quizzes
- Benchmark Assessments
- Projects Alternative
- Assessments
- Benchmark Tests
- Standardized Tests
- Modifications

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests

	<ul style="list-style-type: none"> ● Modified/Teacher Created Mid-Chapter Quiz ● Visual Representation of Skills Assess ● Modified Classwork Assignments ● Modified Benchmarks ● GoMath Reteach Activities and Worksheets ● Project Based Assessments with Scoring Rubric
Vocabulary	
Ratio, Pattern, Rate, Unit Rate, Equivalent Ratio, Equivalent Fractions, Numerator, Denominator, Cooperative Grouping, Rephrase, Rate, Unit Rate, Coordinate Plane, Ordered Pair, X Coordinate, Y Coordinate, Percent, Simplify, Conversion, Factor, Length, Meter, Capacity, Gallon, Liter, Pint, Quart, Gram, Mass, Ounce, Pound, Ton, Weight	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> ● Understand ratio concepts and use ratio reasoning to solve problems <p>Students will know....</p> <ul style="list-style-type: none"> ● Use ratio language to describe a relationship between two quantities 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> ● Model ratios ● Write ratios and rates ● Use a multiplication table to find equivalent ratios ● Solve problems involving ratios by using the strategy "Find a Pattern" ● Use tables to solve problems involving equivalent ratios. ● Use unit rates to make comparisons. ● Solve problems using unit rates ● Use a graph to represent equivalent ratio. ● Use a model to show a percent as a rate per 100.

	<ul style="list-style-type: none"> • Write percents as fractions and decimals. • Write fractions as decimals and percent. • Find a percent of a quantity. • Solve percent problems by applying the strategy, "Use a model". • Find the whole given a part and a percent. • Use ratio reasoning to convert from one unit of length to another. • Use ratio reasoning to convert from one unit of capacity to another. • Use ratio reasoning to convert from one unit of weight or mass to another. • Transform units to solve problems. • Solve problems involving distance, rate and time by applying the strategy, "Use a formula".
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Observe relationships between number patterns. 2. Use fraction strips to model equivalent fractions. 3. Use ratios and rates to solve real world problems 	Chapter 4 Chapter 5 Chapter 6
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, Powerpoint, Instructional Aides	www.khanacademy.org www.funbrain.com www.coolmath.com http://doyourhomeworkarizona.org/6th-grade/math/ratios-and-proportional-relationships

	http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-grade/6th-grade https://www.spellingcity.com/sixth-grade-math-vocabulary.html
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> ● 1:1 ● Grab and Go centers ● Repeating Directions ● Small Group ● Manipulatives ● Interactive Notes ● Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> ● Multi-step problems ● Enrichment Lesson ● Presentation ● Student-driven activities/choices <p>ELL</p> <ul style="list-style-type: none"> ● Elicit Prior Knowledge ● Rephrase ● Understand Context ● Scaffold Language ● Restate ● Cooperative Grouping <p>Special Education/504</p>	

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices		
9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.

X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: The Number System	Duration: Approximately 45 Days
NJ Student Learning Standard: 6.NS	
<p>Unit Summary</p> <ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. <p>Unit Summary: Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.</p>	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.

CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fraction, e.g., by using visual fraction models and equations to represent the problem.
6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$.
6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
6.NS.C.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

6.NS.C.6A	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.		
6.NS.C.6B	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.		
6.NS.C.6C	Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.		
6.NS.C.7	Understand ordering and absolute value of rational numbers.		
6.NS.C.7A	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.		
6.NS.C.7B	Write, interpret, and explain statements of order for rational numbers in real-world contexts.		
6.NS.C.7C	Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. <i>For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</i>		
6.NS.C.7D	Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.		
6.NS.C.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.		
NJ Student Learning Standards for Introduction			
7.NS.A.1.D	Apply properties of operations as strategies to add and subtract rational numbers.		
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.		
SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.		
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.		
<table border="1"> <tr> <td>Essential Understandings</td><td>Essential Questions</td></tr> </table>		Essential Understandings	Essential Questions
Essential Understandings	Essential Questions		

<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • The magnitude of numbers affects the outcome of operations on them. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Operations apply to all types of numbers. • Connections exist between pre-fraction skills (GCF, LCM) and fraction operations, enabling fluent & efficient computation. • All numbers have an exact position on the number line. • All numbers have relationships with other numbers and with zero on the number line. 	<ul style="list-style-type: none"> • How do you write, interpret and use rational numbers? • How can you use the relationship between multiplication and division to divide fractions? • How do you solve real word problems involving whole numbers and decimals?
Evidence of Student Learning	
<p>Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.</p>	<p>Other Assessments</p> <p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Tickets • Class work <p>Summative Assessments</p>

	<ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Dividend, Divisor, Quotient, Prime Factorization, Prime Number, Divisible, Least Common Multiple, Compatible Numbers, Common Factor, Greatest Common Factor, Mixed Number, Simplest Form, Equivalent Fractions, Common Denominator, Benchmark, Integers, Opposites, Rational Number, Coordinate Plane, X Axis, Y Axis, X Coordinate, Y Coordinate, Origin, Ordered Pair, Absolute Value, Quadrants, Compatible Numbers, Reciprocal, Multiplicative Inverses, Line Symmetry, Line of Symmetry	
Knowledge and Skills	

Content	Skills
<ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Fluently divide multi-digit numbers • Write the prime factorization of numbers. • Find the least common multiple of two whole numbers. • Find the greatest common factor of two whole numbers. • Solve problems involving greatest common factor by using the strategy, "Draw a diagram". • Fluently add and subtract multi digit decimals. • Fluently multiply multi digit decimals. • Fluently divide decimals by whole numbers. • Fluently divide whole numbers and decimals by decimals. • Convert between fractions and decimals. • Compare and order fractions and decimals. • Multiply fractions. • Simplify fractional factors by using the greatest common factor. • Use a model to show division of fractions. • Use compatible numbers to estimate quotients of fractions and mixed numbers. • Understand positive and negative numbers and use them to represent real world quantities. • Compare and order integers. • Plot rational numbers on a number line and use a number line to identify opposites. • Compare and order rational numbers
Instructional Plan	

Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Multiply and divide whole numbers with grid paper. 2. Model decimals in tenths and hundredths using colored pencils. 3. Relate mixed numbers and fractions greater than 1 using fraction circles. 4. Use fraction strips to model and use benchmark fractions. 5. Plot ordered pairs in the first quadrant of a coordinate plane. 	Chapter 1 Chapter 2 Chapter 3
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.khanacademy.org www.funbrain.com www.coolmath.com http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/the-number-system http://www.mathchimp.com/6th-grade-math-games
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) 	

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply
21st Century Themes

Career Ready Practices

9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.

X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Expressions and Equations	Duration: Approximately 50 Days
NJ Student Learning Standard: 6.EE	
Unit Summary <ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. 	

- Represent and analyze quantitative relationships between dependent and independent variables.

Unit Summary: Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

6.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.
6.EE.A.2A	Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$.
6.EE.A.2B	Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient);

	view one or more parts of an expression as a single entity. <i>For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.</i>
6.EE.A.3	Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.
6.EE.A.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for..
6.EE.B.5	Understand solving an equation or inequality as a process of answering a question which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
6.EE.B6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
6.EE.B7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.
6.EE.B8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
6.EE.C9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.
	NJ Student Learning Standard for Introduction

7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.		
SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.		
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.		
Essential Understandings		Essential Questions	
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none">• Some mathematical situations can be translated and represented using a variable in an algebraic expression.• The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculation that results.• There is an agreed upon order in which operations are carried out in a numerical expressions.• The Distributive Property of Multiplication over Addition lets you multiply a sum by multiplying each addend separately and then finding the sum of the products.• Some quantities have a mathematical relationship; the value of one quantity can be found if you know the value of the other quantity.• Patterns can sometimes be used to identify a relationship between two quantities.• Some problems can be solved by recording and organizing data in a table and by finding and using numerical patterns in the table.• Equations can be transformed into equivalent equations and solved using properties of equality and inverse operations. A solution to an inequality is a value that makes the inequality true.		<ul style="list-style-type: none">• How do you write, interpret and use algebraic expressions?• How can you use equations and inequalities to represent situations and solve problems?• How can you show relationships between variables?	
Evidence of Student Learning			

Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
	<p>Formative Assessments</p> <ul style="list-style-type: none"> ● Oral Questioning ● Choral Response ● Partners ● Student Conference ● Self-Assessment ● Think-Pair-Share ● Hand Signals ● Peer Reflection ● Graphic Organizers ● Constructive Response ● Teacher Observation Exit Tickets ● Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> ● Chapter Tests ● Quizzes ● Benchmark ● Assessments ● Projects ● Alternative Assessments ● Benchmark Tests ● Standardized Tests ● Modifications <p>Benchmark Assessment</p>

	<ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Vocabulary	
Exponent, Base, Factor, Numerical Expression, Order of Operations, Evaluate, Algebraic Expression, Variable, Terms, Coefficient, Like Term, Equivalent Expression, Commutative Property, Associative Property, Identity Property, Distributive Property, Equation, Solution to an Equation, Variable, Algebraic Expression, Inverse Operations, Subtraction/Addition Property of Equality, Identity Property of Addition, Division/Multiplication Property of Equality, Identity Property of Multiplication, Inequality, Solution to an Inequality, Independent/Dependent Variable, Linear Equations	
Knowledge and Skills	
Content	Skills
	<p>Students will be able to ...</p> <ul style="list-style-type: none"> Write and evaluate expressions using exponents.

<ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Represent and analyze quantitative relationships between dependent and independent variables. 	<ul style="list-style-type: none"> • Use the order of operations to evaluate expressions using exponents. • Write algebraic expressions. • Identify and describe parts of expressions. • Evaluate algebraic expressions and formulas • Use algebraic expressions to solve problems. • Determine whether a number is a solution to an equation. • Translate between words and equations. • Use models to solve additional equations, and multiplication equations. • Use algebra to solve addition, subtraction, multiplication and division equations. • Determine whether a number is a solution of an inequality. • Write algebraic inequalities. • Represent solutions of algebraic inequalities on number line diagrams. • Write an equation to represent the relationship between and independent and dependent variable. • Translate between equations and tables. • Graph the relationship between two quantities. • Translate between equations and graphs
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Evaluate expressions with grouping symbols using the order of operations. 2. Model multiplication using arrays. 	Chapter 7, Chapter 8, Chapter 9

<ul style="list-style-type: none"> 3. Identify parts of an algebraic expression before evaluating. 4. Use models to solve simple one-step equations. 5. Observe the relationship between two number patterns. 6. Use a model to show a rule and observe alternative patterns. 	
Math Literature	
<p>Multiplication: Hershey's Kisses by Jerry Pollatta 365 Penguins by Jean Luc Fromental The Doorbell Rang by Pat Hutchings</p> <p>Division: Safari Park by Stuart Murphy The Doorbell Rang by Pat Hutchings</p>	
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.funbrain.com www.coolmath.com http://www.mathchimp.com/6th-grade-math-resources http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/expressions-and-equations http://www.insidemathematics.org/common-core-

Suggested Options for Differentiation

Basic Skills/Economically Disadvantaged/Students at Risk

- 1:1
- Grab and Go centers
- Repeating Directions
- Small Group
- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan

- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Geometry	Duration: Approximately 20 Days
NJ Student Learning Standard: 6.G	
Unit Summary <ul style="list-style-type: none"> • Solve real-world and mathematical problems involving area, volume, and surface area. <p>Unit Summary: Students build on their work with area in elementary school by reasoning about relationships among shapes to determine are surface area, and volume. Try to find the areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop. And justify formulas for areas of triangle and parallelograms. Students find the areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.</p>	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.

CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
6.G.A.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problem.
6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
	NJ Student Learning Standards for Introduction
7.G.A.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	Essential Questions
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. • Geometric properties can be used to construct geometric figures. • Coordinate geometry facilitates the visualization of algebraic relationships 	<ul style="list-style-type: none"> • How can you use measurements to describe two dimensional figures? • How can you use measurements to describe three dimensional figures? • How can measurements and geometric relationships be used to solve problems? • How does coordinate geometry illustrate a connection between geometry and algebra?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Formative Assessments <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Card Tickets

	<ul style="list-style-type: none"> • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects Alternative • Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Area, Parallelogram, Congruent, Diagonals, Right/Acute/Obtuse Triangle, Trapezoid, Regular Polygon, Composite Figure, Volume, Solid Figure, Net Face, Edge, Vertex, Base, Lateral Face, Prism, Pyramid, Polygon	
Knowledge and Skills	
Content:	Skills:

Solve real-world and mathematical problems involving area, volume, and surface area.	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Find the area of parallelograms. • Investigate the relationship among the areas of triangles, rectangles and parallelograms. • Find the area of triangles. • Investigate the relationship between the areas of trapezoids and parallelograms. • Find the area of trapezoids. • Find the area of regular polygons • Make and identify a 3-D figure from a net • Use nets to find surface area • Show volume as $V=Bh$ and $V=lwh$
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Find the area of a rectangle with fractional side lengths. 2. Find the perimeter and area of rectangles and squares. 3. Use small unit cubes to find the volume of rectangular prisms. 4. Explore nets by use of different shaped prisms and pyramids. 	Chapter 10 & 11
Math Literature	
<p>Sir Cumference and the Great Knight of Angleland (A Math Adventure) By Cindy Neuschwander-This series explores geometric concepts in an adventurous way.</p> <p>Sir Cumference and the Sword in the Cone: A Math Adventure By Cindy Neuschwander</p> <p>Sir Cumference and the Dragon of Pi (Math Adventures)- Simple tangram story that can be used to review basic geometry terms.</p>	

Grandfather Tang's Story Ann Tompert- Geometry/tessellation story A Cloak For The Dreamer Aileen Friedman- Shape story The Greedy Triangle Marilyn Burns - Geometry story Flatland Edwin Edwin Abbot Mr. Archimedes' Bath Pamela Allen Who Sank the Boat? Pamela Allen	
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.khanacademy.org www.funbrain.com http://www.math4childrenplus.com/games/geometry/ http://www.adaptedmind.com/categorylist.php?categoryId=6 http://www.kidsmathTV.com/6th-grade-videos/
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) Gifted and Talented <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation 	

- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 5: Statistics and Probability	Duration: Approximately 15 Days
NJ Student Learning Standard: 6.SP	
Unit Summary <ul style="list-style-type: none"> • Develop understanding of statistical variability • Summarize and describe distributions Unit Summary: Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.

CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

6.SP.A.1	Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. <ul style="list-style-type: none"> • Geometric properties can be used to construct geometric figures. • Coordinate geometry facilitates the visualization of algebraic relationships.
6.SP.A.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
6.SP.A.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
6.SP.B.4	Display numerical data in plots on a number line, including dot plots, histograms, and boxplots.
6.SP.B.5a	Reporting the number of observations.
6.SP.B.5b	Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
6.SP.B.5c	Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
6.SP.B.5d	Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
	NJ Student Learning Standard for Introduction

7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
SL.6.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	Essential Questions
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • Statistical questions anticipate variability in the data. These questions can be answered by collecting and analyzing data. The question to be answered determines the data that needs to be collected. • Each type of graph is most appropriate for certain kinds of data. A histogram uses bars to compare continuous numerical data grouped into intervals. • Box plots are useful for plotting data above a number line. Box plots show the spread for each quarter of the data. • A set of data collected to answer a statistical question has a • distribution, which can be described by its center, spread, and overall shape 	<ul style="list-style-type: none"> • How can you describe the shape of a data set using graphs, measures of center and measures of variability? • How can you display data and analyze measures of center? • What are ways data can be represented?
Evidence of Student Learning	

<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests
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	<ul style="list-style-type: none"> ● Modified/Teacher Created Mid-Chapter Quiz ● Visual Representation of Skills Assess ● Modified Classwork Assignments ● Modified Benchmarks ● GoMath Reteach Activities and Worksheets ● Project Based Assessments with Scoring Rubric
Vocabulary	
Data, Statistical Question, Dot Plot, Frequency, Frequency Table, Relationship Frequency Table, Histogram, Bar Graph Measure of Center, Mean, Median, Mode, Outlier, Lower/Upper Quartile, Box Plot, Absolute, Deviation, Measure of Variability, Range, Interquartile Range, Distribution, Statistical Question	
Knowledge and Skills	
Content:	Skills:
<ul style="list-style-type: none"> ● Develop understanding of statistical variability ● Summarize and describe distributions of data through graphing 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> ● Recognize statistical questions. ● Describe a data set by stating what quantity was measured and how it was measured. ● Use frequency tables and dot plots to organize data. ● Display data and histograms. ● Understand the mean as a fair share and as a balance point.

	<ul style="list-style-type: none"> • Summarize data by using mean, median and mode. • Determine the effect of outliers on measures of center. • Solve problems involving data by using the strategy, "Draw a diagram." • Describe overall pattern in data including, clusters, peak, gaps and symmetry. • Display data and box plots. • Understand mean, absolute deviation as a measure of variability from the mean. • Summarize a data set by using range, interquartile range, and mean absolute deviation. • Choose appropriate measures of center and variability to describe data and justify the choice. • Recognize what measures of center and variability indicate about a data set.
Instructional Plan	
Suggested Activities	Resources
5. Calculate percent based on data. 6. Create and interpret bar graphs. 7. Use a dot plot to represent and interpret data. 8. Create a dot plot from measurements and perform simple operations on the data.	Chapter 12 Chapter 13
Math Literature	

Anno's Hat Tricks, Akihiro Nozaki- Probability Jumanji, Chris Van Allsburg- Probability Martha Blah Blah, Susan Meddaugh- Probability The Phantom Tollbooth, Norton Juster- Data Analysis, Probability	
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.khanacademy.org www.funbrain.com http://www.internet4classrooms.com/skill_builders/probability_math_sixth_6th_grade.htm http://www.spellingcity.com/statistics-and-probability-middle-school.html https://www.ixl.com/math/grade-6
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) Gifted and Talented <ul style="list-style-type: none"> • Multi-step problems 	

- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies



Estell Manor School District

Mathematics Curriculum Grade 7

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 1 Ratios	Approximately 40 Days
Unit 2 The Number System	Approximately 45 Days
Unit 3 Expressions and Equations	Approximately 50 Days
Unit 4 Geometry	Approximately 20 Days
Unit 5 Statistics and Probability	Approximately 15 Days

Primary Interdisciplinary Connections: Science, Social Studies, Language Arts, Technology, and 21st Century Life and Careers. For further clarification see New Jersey Student Learning Standards at <http://www.nj.gov/education/cccs/>

Grade 7 Overview

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none">• What is the problem asking?• How will you use that information?• What other information do you need?• Why did you choose that operation?• What is another way to solve that problem?• What did you do first? Why?• What can you do if you don't know how to solve a problem?• Have you solved a problem like this one?• When did you realize your first method would not work?• How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none">• What is a situation that could be represented by this equation?• What operation did you use to represent the situation?• Why does that operation represent the situation?• What properties did you use to find the answer?• How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none">• Will that method always work?• How do you know?• What do you think about what the other student said?• Who can tell us about a different method?• What do you think will happen if ...?• When would that not be true?• Why do you agree/disagree with what the other student said?• What do you want to ask the other student about that method?• How does that drawing support your work?
Practice 4: Model with mathematics	<ul style="list-style-type: none">• Why is that a good model for this problem?• How can you use a simpler problem to help you find the answer?

	<ul style="list-style-type: none"> • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer? • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
MP #1	Made sense of problems, evaluated approaches,	Made sense of problems and persevere	Made sense of problems.	With support, made sense of problems.

	and persevere in solving them.	in solving them.		
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	Constructed viable arguments and critique the reasoning of others.	Constructed viable arguments.	Compared arguments.
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.
MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and details when calculating and communicating. Examined details of claims and made explicit use of definitions.	Attends to precision and details when calculating and communicating.	Where accurate when calculating and communicating.	Where clear when calculating and communicating.

MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns to solve problems.	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and expressed regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 1: Ratios and Proportional Relationships	Duration: Approximately 40 Days
NJ Student Learning Standard: 7.RP	
Unit Summary <ul style="list-style-type: none"> Understand ratio concepts and use ratio reasoning to solve problems Unit Summary: Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus, students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide	

variety of problems involving ratios and rates.

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour
7.RP.A.2	<p>Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</p> <p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special</p>

	attention to the points (0, 0) and (1, r) where r is the unit rate.
7.R.P.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error
	NJ Student Learning Standards for Introduction
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.
7.RP.A.2.	<p>Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</p> <p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate..</p>
7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
8.1 Educational Technology:	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
A. Technology Operations and Concepts	The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.1 21st Century Life Skills:	All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures.
B. Creativity	Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.

and Innovation:			
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.		
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.		
Essential Understandings		Essential Questions	
<p><i>Students will understand that....</i></p> <ul style="list-style-type: none">• A ratio is a special relationship between two quantities where for every x units of one quantity there are y units of another• In a proportional relationship there are an infinite number of ratios equal to the lowest terms or constant ratio. Equal ratios can be found by multiplying both terms by the same non-zero number.• A unit rate is a rate that compares a quantity to one unit of another quantity.• A formula is a common relationship between quantities expressed as an equation.• A special proportional relationship involves distance (d), rate (r), and time (t). The formula showing this relationship is $d= r \times t$.• Rates are easily compared when each is expressed as a unit rate.		<ul style="list-style-type: none">• What are ratios and rates, and how are they used in solving problems?• What is a proportion, and what role does a ratio play in a proportion?• How can you use ratios to express relationships and solve problems?• How can you use ratio reasoning to solve percent problems?• How can you use measurements to help you describe and compare objects?	
Evidence of Student Learning			
Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.		Other Assessments	
		Formative Assessments	

- Oral Questioning
- Choral Response
- Partners
- Student Conference
- Self-Assessment
- Think-Pair-Share
- Hand Signals
- Peer Reflection
- Graphic Organizers
- Constructive Response
- Teacher Observation Exit Card Tickets
- Class work

Summative Assessments

- Chapter Tests
- Quizzes
- Benchmark Assessments
- Projects Alternative
- Assessments
- Benchmark Tests
- Standardized Tests
- Modifications

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Untimed Fact Practice Assessment

	<ul style="list-style-type: none"> • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Ratio, Pattern, Rate, Unit Rate, Equivalent Ratio, Equivalent Fractions, Numerator, Denominator, Cooperative Grouping, Rephrase, Rate, Unit Rate, Coordinate Plane, Ordered Pair, X Coordinate, Y Coordinate, Percent, Simplify, Conversion, Factor, Length, Meter, Capacity, Gallon, Liter, Pint, Quart, Gram, Mass, Ounce, Pound, Ton, Weight	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> • Understand ratio concepts and use ratio reasoning to solve problems <p>Students will know....</p> <ul style="list-style-type: none"> • Use ratio language to describe a relationship between two quantities 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Model ratios • Write ratios and rates • Use a multiplication table to find equivalent ratios • Solve problems involving ratios by using the strategy "Find a Pattern" • Use tables to solve problems involving equivalent ratios. • Use unit rates to make comparisons. • Solve problems using unit rates • Use a graph to represent equivalent ratio. • Use a model to show a percent as a rate per

	<p>100.</p> <ul style="list-style-type: none"> • Write parents as fractions and decimals. • Write fractions as decimals and percent. • Find a percent of a quantity. • Solve percent problems by applying the strategy, "Use a model". • Find the whole given a part and a percent. • Use ratio reasoning to convert from one unit of length to another. • Use ratio reasoning to convert from one unit of capacity to another. • Use ratio reasoning to convert from one unit of weight or mass to another. • Transform units to solve problems. • Solve problems involving distance, rate and time by applying the strategy, "Use a formula".
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Observe relationships between number patterns. 2. Use fraction strips to model equivalent fractions. 3. Use ratios and rates to solve real world problems 	Chapter 4 Chapter 5 Chapter 6
Websites	
<p>Interactive arithmetic lessons Online Resources Online Videos Interactive Games</p>	<p>www.khanacademy.org www.funbrain.com www.coolmath.com http://doyourhomeworkarizona.org/6th-grade/math/ratios-</p>

Games, Powerpoint, Instructional Aides	and-proportional-relationships http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-grade/6th-grade https://www.spellingcity.com/sixth-grade-math-vocabulary.html
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation • Student-driven activities/choices <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase • Understand Context • Scaffold Language • Restate • Cooperative Grouping 	

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.

X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.
	Career Preparation	√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: The Number System	Duration: Approximately 45 Days
NJ Student Learning Standard: 7.NS	
<p>Unit Summary</p> <ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. <p>Unit Summary: Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.</p>	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.

CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.NS.A.	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
7.NS.A.1	<p>1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>a. Describe situations in which opposite quantities combine to make 0. For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?</p> <p>b. Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p>
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations,

	<p>particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.1
NJ Student Learning Standards for Introduction	
7.NS.A.1.D	Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • The magnitude of numbers affects the outcome of operations on them. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Operations apply to all types of numbers. • Connections exist between pre-fraction skills 	<ul style="list-style-type: none"> • How do you write, interpret and use rational numbers? • How can you use the relationship between multiplication and division to divide fractions? • How do you solve real word problems involving whole numbers and decimals?

<p>(GCF, LCM) and fraction operations, enabling fluent & efficient computation.</p> <ul style="list-style-type: none"> • All numbers have an exact position on the number line. • All numbers have relationships with other numbers and with zero on the number line. 	
<p align="center">Evidence of Student Learning</p>	
<p>Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.</p>	<p align="center">Other Assessments</p>
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests

	<ul style="list-style-type: none"> • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Dividend, Divisor, Quotient, Prime Factorization, Prime Number, Divisible, Least Common Multiple, Compatible Numbers, Common Factor, Greatest Common Factor, Mixed Number, Simplest Form, Equivalent Fractions, Common Denominator, Benchmark, Integers, Opposites, Rational Number, Coordinate Plane, X Axis, Y Axis, X Coordinate, Y Coordinate, Origin, Ordered Pair, Absolute Value, Quadrants, Compatible Numbers, Reciprocal, Multiplicative Inverses, Line Symmetry, Line of Symmetry	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Fluently divide multi-digit numbers • Write the prime factorization of numbers. • Find the least common multiple of two whole numbers.

<ul style="list-style-type: none"> • Apply and extend previous understandings of numbers to the system of rational numbers. 	<ul style="list-style-type: none"> • Find the greatest common factor of two whole numbers. • Solve problems involving greatest common factor by using the strategy, “Draw a diagram”. • Fluently add and subtract multi digit decimals. • Fluently multiply multi digit decimals. • Fluently divide decimals by whole numbers. • Fluently divide whole numbers and decimals by decimals. • Convert between fractions and decimals. • Compare and order fractions and decimals. • Multiply fractions. • Simplify fractional factors by using the greatest common factor. • Use a model to show division of fractions. • Use compatible numbers to estimate quotients of fractions and mixed numbers. • Understand positive and negative numbers and use them to represent real world quantities. • Compare and order integers. • Plot rational numbers on a number line and use a number line to identify opposites. • Compare and order rational numbers
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Multiply and divide whole numbers with grid paper. 2. Model decimals in tenths and hundredths using colored pencils. 3. Relate mixed numbers and fractions greater than 1 using fraction circles. 	Chapter 1 Chapter 2 Chapter 3

<p>4. Use fraction strips to model and use benchmark fractions.</p> <p>5. Plot ordered pairs in the first quadrant of a coordinate plane.</p>	
Websites	
<p>Interactive arithmetic lessons</p> <p>Online Resources</p> <p>Online Videos</p> <p>Interactive Games</p> <p>Games, PowerPoint, Instructional Aides</p>	<p>www.khanacademy.org</p> <p>www.funbrain.com</p> <p>www.coolmath.com</p> <p>http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/the-number-system</p> <p>http://www.mathchimp.com/6th-grade-math-games</p>
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation • Student-driven activities/choices <p>ELL</p>	

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Expressions and Equations	Duration: Approximately 50 Days
NJ Student Learning Standard: 7.EE	
Unit Summary <ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Represent and analyze quantitative relationships between dependent and independent variables. <p>Unit Summary: Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of</p>	

quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities

21st Century Life and Careers

CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.EE.A	Use properties of operations to generate equivalent expressions.
7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.A.1.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”
7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
7EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

7.EE.B.4	<p>Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities</p> <p>a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</p> <p>b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</p>	
	NJ Student Learning Standard for Introduction	
7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.	
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	
Essential Understandings		Essential Questions
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> Some mathematical situations can be translated and represented using a variable in an algebraic expression. The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculation that results. There is an agreed upon order in which operations are carried out in a numerical expressions. The Distributive Property of Multiplication over Addition lets you multiply a sum by multiplying each addend separately and then finding the sum of the products. Some quantities have a mathematical relationship; the 		<ul style="list-style-type: none"> How do you write, interpret and use algebraic expressions? How can you use equations and inequalities to represent situations and solve problems? How can you show relationships between variables?

<p>value of one quantity can be found if you know the value of the other quantity.</p> <ul style="list-style-type: none"> • Patterns can sometimes be used to identify a relationship between two quantities. • Some problems can be solved by recording and organizing data in a table and by finding and using numerical patterns in the table. • Equations can be transformed into equivalent equations and solved using properties of equality and inverse operations. A solution to an inequality is a value that makes the inequality true. 	
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Tickets • Class work <p>Summative Assessments</p>

	<ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Exponent, Base, Factor, Numerical Expression, Order of Operations, Evaluate, Algebraic Expression, Variable, Terms, Coefficient, Like Term, Equivalent Expression, Commutative Property, Associative Property, Identity Property, Distributive Property, Equation, Solution to an Equation, Variable, Algebraic Expression, Inverse Operations,	

Subtraction/Addition Property of Equality, Identity Property of Addition, Division/Multiplication Property of Equality, Identity Property of Multiplication, Inequality, Solution to an Inequality, Independent/Dependent Variable, Linear Equations	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Represent and analyze quantitative relationships between dependent and independent variables. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Write and evaluate expressions using exponents. • Use the order of operations to evaluate expressions using exponents. • Write algebraic expressions. • Identify and describe parts of expressions. • Evaluate algebraic expressions and formulas • Use algebraic expressions to solve problems. • Determine whether a number is a solution to an equation. • Translate between words and equations. • Use models to solve additional equations, and multiplication equations. • Use algebra to solve addition, subtraction, multiplication and division equations. • Determine whether a number is a solution of an inequality. • Write algebraic inequalities. • Represent solutions of algebraic inequalities on number line diagrams. • Write an equation to represent the relationship between independent and dependent

	variable. <ul style="list-style-type: none"> • Translate between equations and tables. • Graph the relationship between two quantities. • Translate between equations and graphs
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Evaluate expressions with grouping symbols using the order of operations. 2. Model multiplication using arrays. 3. Identify parts of an algebraic expression before evaluating. 4. Use models to solve simple one-step equations. 5. Observe the relationship between two number patterns. 6. Use a model to show a rule and observe alternative patterns. 	Chapter 7, Chapter 8, Chapter 9
Math Literature	
Multiplication: Hershey's Kisses by Jerry Pollatta 365 Penguins by Jean Luc Fromental The Doorbell Rang by Pat Hutchings Division: Safari Park by Stuart Murphy The Doorbell Rang by Pat Hutchings	

Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.funbrain.com www.coolmath.com http://www.mathchimp.com/6th-grade-math-resources http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/expressions-and-equations http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/expressions-and-equations
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation • Student-driven activities/choices 	

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.

	Money Management		CRP3.Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	√	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Geometry	Duration: Approximately 20 Days
NJ Student Learning Standard: 7.G	
Unit Summary <ul style="list-style-type: none"> • Solve real-world and mathematical problems involving area, volume, and surface area. Unit Summary: Students build on their work with area in elementary school by reasoning about relationships among shapes to determine are surface area, and volume. Try to find the areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop. And justify formulas for areas of triangle and parallelograms. Students find the areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in	

Grade 7 by drawing polygons in the coordinate plane.

21st Century Life and Careers

CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.G.A.	Draw, construct, and describe geometrical figures and describe the relationships between them.
7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale
77G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.B	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.				
	NJ Student Learning Standards for Introduction				
7.G.A.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.				
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.				
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.				
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.				
<table border="1"> <tr> <th>Essential Understandings</th><th>Essential Questions</th></tr> <tr> <td> <i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. Geometric properties can be used to construct geometric figures. Coordinate geometry facilitates the visualization of algebraic relationships </td><td> <ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures? How can you use measurements to describe three dimensional figures? How can measurements and geometric relationships be used to solve problems? How does coordinate geometry illustrate a connection between geometry and algebra? </td></tr> </table>		Essential Understandings	Essential Questions	<i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. Geometric properties can be used to construct geometric figures. Coordinate geometry facilitates the visualization of algebraic relationships 	<ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures? How can you use measurements to describe three dimensional figures? How can measurements and geometric relationships be used to solve problems? How does coordinate geometry illustrate a connection between geometry and algebra?
Essential Understandings	Essential Questions				
<i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area. Geometric properties can be used to construct geometric figures. Coordinate geometry facilitates the visualization of algebraic relationships 	<ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures? How can you use measurements to describe three dimensional figures? How can measurements and geometric relationships be used to solve problems? How does coordinate geometry illustrate a connection between geometry and algebra? 				
Evidence of Student Learning					

Performance Tasks: *Activities to provide evidence for student learning of content and cognitive skills.*

Formative Assessments

- Oral Questioning
- Choral Response
- Partners
- Student Conference
- Self-Assessment
- Think-Pair-Share
- Hand Signals
- Peer Reflection
- Graphic Organizers
- Constructive Response
- Teacher Observation Exit Card Tickets
- Class work

Summative Assessments

- Chapter Tests
- Quizzes
- Benchmark Assessments
- Projects Alternative
- Assessments
- Benchmark Tests
- Standardized Tests
- Modifications

Benchmark Assessment

- GoMath Benchmark Assessment

Alternative Assessments

- Untimed Fact Practice Assessment
- Manipulative Driven Assessment
- Modified/Teacher Created Chapter Tests
- Modified/Teacher Created Mid-Chapter Quiz
- Visual Representation of Skills Assess

	<ul style="list-style-type: none"> • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Area, Parallelogram, Congruent, Diagonals, Right/Acute/Obtuse Triangle, Trapezoid, Regular Polygon, Composite Figure, Volume, Solid Figure, Net Face, Edge, Vertex, Base, Lateral Face, Prism, Pyramid, Polygon	
Knowledge and Skills	
Content:	Skills:
Solve real-world and mathematical problems involving area, volume, and surface area.	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Find the area of parallelograms. • Investigate the relationship among the areas of triangles, rectangles and parallelograms. • Find the area of triangles. • Investigate the relationship between the areas of trapezoids and parallelograms. • Find the area of trapezoids. • Find the area of regular polygons • Make and identify a 3-D figure from a net • Use nets to find surface area • Show volume as $V=Bh$ and $V=lwh$
Instructional Plan	
Suggested Activities	Resources

<ol style="list-style-type: none"> 1. Find the area of a rectangle with fractional side lengths. 2. Find the perimeter and area of rectangles and squares. 3. Use small unit cubes to find the volume of rectangular prisms. 4. Explore nets by use of different shaped prisms and pyramids. 	Chapter 10 & 11
Math Literature	
<p>Sir Cumference and the Great Knight of Angleland (A Math Adventure) By Cindy Neuschwander-This series explores geometric concepts in an adventurous way.</p> <p>Sir Cumference and the Sword in the Cone: A Math Adventure By Cindy Neuschwander</p> <p>Sir Cumference and the Dragon of Pi (Math Adventures)- Simple tangram story that can be used to review basic geometry terms.</p> <p>Grandfather Tang's Story Ann Tompert- Geometry/tessellation story</p> <p>A Cloak For The Dreamer Aileen Friedman- Shape story</p> <p>The Greedy Triangle Marilyn Burns - Geometry story</p> <p>Flatland Edwin Edwin Abbot</p> <p>Mr. Archimedes' Bath Pamela Allen</p> <p>Who Sank the Boat? Pamela Allen</p>	
Websites	
<p>Interactive arithmetic lessons</p> <p>Online Resources</p> <p>Online Videos</p> <p>Interactive Games</p> <p>Games, PowerPoint, Instructional Aides</p>	<p>www.kutasoftware.com www.khanacademy.org</p> <p>www.funbrain.com</p> <p>http://www.math4childrenplus.com/games/geometry/</p> <p>http://www.adaptedmind.com/categorylist.php?categoryId=6</p> <p>http://www.kidsmathTV.com/6th-grade-videos/</p>
Suggested Options for Differentiation	

Basic Skills/Economically Disadvantaged/Students at Risk

- 1:1
- Grab and Go centers
- Repeating Directions
- Small Group
- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 5: Statistics and Probability	Duration: Approximately 15 Days
NJ Student Learning Standard: 7.SP	
Unit Summary <ul style="list-style-type: none"> • Develop understanding of statistical variability • Summarize and describe distributions Unit Summary: Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.SP.A.	Use random sampling to draw inferences about a population
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.

	Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
7.SP.B	Draw informal comparative inferences about two populations.
7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.
7.SP.B.5.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.
7.SP.B.5.C	Investigate chance processes and develop, use, and evaluate probability models.
7.SP.B.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $1/2$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

	<p>b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.</p> <p>c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</p>	
	NJ Student Learning Standard for Introduction	
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.	
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	
Essential Understandings		Essential Questions
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • Statistical questions anticipate variability in the data. These questions can be answered by collecting and analyzing data. The question to be answered determines the data that needs to be collected. • Each type of graph is most appropriate for certain kinds of data. A histogram uses bars to compare continuous numerical data grouped into intervals. • Box plots are useful for plotting data above a number line. Box plots show the spread for each quarter of the data. • A set of data collected to answer a statistical question has a • distribution, which can be described by its center, spread, and overall shape 		<ul style="list-style-type: none"> • How can you describe the shape of a data set using graphs, measures of center and measures of variability? • How can you display data and analyze measures of center? • What are ways data can be represented?
Evidence of Student Learning		

<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment
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	<ul style="list-style-type: none"> • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	
Data, Statistical Question, Dot Plot, Frequency, Frequency Table, Relationship Frequency Table, Histogram, Bar Graph Measure of Center, Mean, Median, Mode, Outlier, Lower/Upper Quartile, Box Plot, Absolute, Deviation, Measure of Variability, Range, Interquartile Range, Distribution, Statistical Question	
Knowledge and Skills	
Content:	Skills:
<ul style="list-style-type: none"> • Develop understanding of statistical variability • Summarize and describe distributions of data through graphing 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Recognize statistical questions. • Describe a data set by stating what quantity was measured and how it was measured. • Use frequency tables and dot plots to organize data. • Display data and histograms. • Understand the mean as a fair share and as a balance point. • Summarize data by using mean, median and

	<p>mode.</p> <ul style="list-style-type: none"> • Determine the effect of outliers on measures of center. • Solve problems involving data by using the strategy, "Draw a diagram." • Describe overall pattern in data including, clusters, peak, gaps and symmetry. • Display data and box plots. • Understand mean, absolute deviation as a measure of variability from the mean. • Summarize a data set by using range, interquartile range, and mean absolute deviation. • Choose appropriate measures of center and variability to describe data and justify the choice. • Recognize what measures of center and variability indicate about a data set.
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 5. Calculate percent based on data. 6. Create and interpret bar graphs. 7. Use a dot plot to represent and interpret data. 8. Create a dot plot from measurements and perform simple operations on the data. 	Chapter 12 Chapter 13
Math Literature	
Anno's Hat Tricks, Akihiro Nozaki- Probability	

Jumanji, Chris Van Allsburg- Probability Martha Blah Blah, Susan Meddaugh- Probability The Phantom Tollbooth, Norton Juster- Data Analysis, Probability	
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.khanacademy.org www.funbrain.com http://www.internet4classrooms.com/skill_builders/probability_math_sixth_6th_grade.htm http://www.spellingcity.com/statistics-and-probability-middle-school.html https://www.ixl.com/math/grade-6
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson 	

- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies



Estell Manor School District

Mathematics Curriculum Grade 8

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Suggested Pacing Guide

Unit	Unit Length
Unit 2 The Number System	Approximately 45 Days
Unit 3 Expressions and Equations	Approximately 50 Days
Unit 1 Functions	Approximately 40 Days
Unit 4 Geometry	Approximately 20 Days
Unit 5 Statistics and Probability	Approximately 15 Days

Primary Interdisciplinary Connections: Science, Social Studies, Language Arts, Technology, and 21st Century Life and Careers. For further clarification see New Jersey Student Learning Standards at <http://www.nj.gov/education/cccs/>

Grade 8 Overview

Functions

- Define, evaluate, and compare functions and use them to model relationships between quantities.
- Use functions to model relationships between quantities.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none"> ● What is the problem asking? ● How will you use that information? ● What other information do you need? ● Why did you choose that operation? ● What is another way to solve that problem? ● What did you do first? Why? ● What can you do if you don't know how to solve a problem? ● Have you solved a problem like this one? ● When did you realize your first method would not work? ● How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none"> ● What is a situation that could be represented by this equation? ● What operation did you use to represent the situation ● Why does that operation represent the situation? ● What properties did you use to find the answer? ● How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none"> ● Will that method always work? ● How do you know? ● What do you think about what the other student said? ● Who can tell us about a different method? ● What do you think will happen if ...? ● When would that not be true?

	<ul style="list-style-type: none"> • Why do you agree/disagree with what the other student said? • What do you want to ask the other student about that method? • How does that drawing support your work?
Practice 4: Model with mathematics	<ul style="list-style-type: none"> • Why is that a good model for this problem? • How can you use a simpler problem to help you find the answer? • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer? • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
MP #1	Made sense of problems, evaluated approaches, and persevere in solving them.	Made sense of problems and persevere in solving them.	Made sense of problems.	With support, made sense of problems.
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	Constructed viable arguments and critique the reasoning of others.	Constructed viable arguments.	Compared arguments.
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.
MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and	Attends to precision and	Where accurate when	Where clear when

	details when calculating and communicating. Examined details of claims and made explicit use of definitions.	details when calculating and communicating.	calculating and communicating.	calculating and communicating.
MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns to solve problems.	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and expressed regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Functions	Duration: Approximately 40 Days
NJ Student Learning Standard: 8.F	

Unit Summary	
<ul style="list-style-type: none"> Understand concept of functions and use that reasoning to evaluate and compare functions and the relationship between quantities. 	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour
7.RP.A.2	<p>Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of</p>

	<p>proportional relationships.</p> <p>c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</p> <p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.</p>
7.R.P.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error
	NJ Student Learning Standards for Introduction
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.
7.RP.A.2.	<p>Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</p> <p>d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate..</p>
7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
8.1 Educational Technology:	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
A. Technology Operations and Concepts	The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.
9.1 21st	All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function

Century Life Skills:	successfully as global citizens and workers in diverse ethnic and organizational cultures.
B. Creativity and Innovation:	Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	
<p><i>Students will understand that....</i></p> <ul style="list-style-type: none"> • A ratio is a special relationship between two quantities where for every x units of one quantity there are y units of another • In a proportional relationship there are an infinite number of ratios equal to the lowest terms or constant ratio. Equal ratios can be found by multiplying both terms by the same non-zero number. • A unit rate is a rate that compares a quantity to one unit of another quantity. • A formula is a common relationship between quantities expressed as an equation. • A special proportional relationship involves distance (d), rate (r), and time (t). The formula showing this relationship is $d = r \times t$. • Rates are easily compared when each is expressed as a unit rate. 	<p>Essential Questions</p> <ul style="list-style-type: none"> • What are ratios and rates, and how are they used in solving problems? • What is a proportion, and what role does a ratio play in a proportion? • How can you use ratios to express relationships and solve problems? • How can you use ratio reasoning to solve percent problems? • How can you use measurements to help you describe and compare objects?
Evidence of Student Learning	

<p>Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.</p>	<p>Other Assessments</p>
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects Alternative • Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p>

	<ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Vocabulary	
Ratio, Pattern, Rate, Unit Rate, Equivalent Ratio, Equivalent Fractions, Numerator, Denominator, Cooperative Grouping, Rephrase, Rate, Unit Rate, Coordinate Plane, Ordered Pair, X Coordinate, Y Coordinate, Percent, Simplify, Conversion, Factor, Length, Meter, Capacity, Gallon, Liter, Pint, Quart, Gram, Mass, Ounce, Pound, Ton, Weight	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> Understand ratio concepts and use ratio reasoning to solve problems <p>Students will know....</p> <ul style="list-style-type: none"> Use ratio language to describe a relationship between two quantities 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> Model ratios Write ratios and rates Use a multiplication table to find equivalent ratios Solve problems involving ratios by using the strategy "Find a Pattern" Use tables to solve problems involving equivalent ratios.

	<ul style="list-style-type: none"> • Use unit rates to make comparisons. • Solve problems using unit rates • Use a graph to represent equivalent ratio. • Use a model to show a percent as a rate per 100. • Write parents as fractions and decimals. • Write fractions as decimals and percent. • Find a percent of a quantity. • Solve percent problems by applying the strategy, “Use a model”. • Find the whole given a part and a percent. • Use ratio reasoning to convert from one unit of length to another. • Use ratio reasoning to convert from one unit of capacity to another. • Use ratio reasoning to convert from one unit of weight or mass to another. • Transform units to solve problems. • Solve problems involving distance, rate and time by applying the strategy, “Use a formula”.
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Observe relationships between number patterns. 2. Use fraction strips to model equivalent fractions. 3. Use ratios and rates to solve real world problems 	Chapter 4 Chapter 5 Chapter 6
Websites	

<p>Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, Powerpoint, Instructional Aides</p>	<p>www.khanacademy.org www.funbrain.com www.coolmath.com http://doyourhomeworkarizona.org/6th-grade/math/ratios-and-proportional-relationships http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-grade/6th-grade https://www.spellingcity.com/sixth-grade-math-vocabulary.html</p>
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation • Student-driven activities/choices <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase 	

- Understand Context
 - Scaffold Language
 - Restate
 - Cooperative Grouping
- Special Education/504
- One on one instruction
 - Adaptive devices
 - Provide differentiated instruction as needed
 - Follow all IEP modifications/504 plan
 - Provide manipulatives or the opportunity to draw solution strategies

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.

	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: The Number System	Duration: Approximately 45 Days
NJ Student Learning Standard: 8.NS	
Unit Summary <ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. Unit Summary: Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

8.NS.A.	Know that there are numbers that are not rational, and approximate them by rational numbers.
8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
NJ Student Learning Standards for Introduction	
8.NS.A.1.D	Apply properties of operations as strategies to add and subtract rational numbers.

8.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
SL.8.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
Essential Understandings	
<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> • The magnitude of numbers affects the outcome of operations on them. • Computational fluency includes understanding the meaning and the appropriate use of numerical operations. • Operations apply to all types of numbers. • Connections exist between pre-fraction skills (GCF, LCM) and fraction operations, enabling fluent & efficient computation. • All numbers have an exact position on the number line. • All numbers have relationships with other numbers and with zero on the number line. 	
Essential Questions	
<ul style="list-style-type: none"> • How do you write, interpret and use rational numbers? • How can you use the relationship between multiplication and division to divide fractions? • How do you solve real word problems involving whole numbers and decimals? 	
Evidence of Student Learning	
Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.	
Other Assessments	
Formative Assessments <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment 	

	<ul style="list-style-type: none"> • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	

Dividend, Divisor, Quotient, Prime Factorization, Prime Number, Divisible, Least Common Multiple, Compatible Numbers, Common Factor, Greatest Common Factor, Mixed Number, Simplest Form, Equivalent Fractions, Common Denominator, Benchmark, Integers, Opposites, Rational Number, Coordinate Plane, X Axis, Y Axis, X Coordinate, Y Coordinate, Origin, Ordered Pair, Absolute Value, Quadrants, Compatible Numbers, Reciprocal, Multiplicative Inverses, Line Symmetry, Line of Symmetry	
Knowledge and Skills	
Content	Skills
<ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Apply and extend previous understandings of numbers to the system of rational numbers. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Fluently divide multi-digit numbers • Write the prime factorization of numbers. • Find the least common multiple of two whole numbers. • Find the greatest common factor of two whole numbers. • Solve problems involving greatest common factor by using the strategy, "Draw a diagram". • Fluently add and subtract multi digit decimals. • Fluently multiply multi digit decimals. • Fluently divide decimals by whole numbers. • Fluently divide whole numbers and decimals by decimals. • Convert between fractions and decimals. • Compare and order fractions and decimals. • Multiply fractions. • Simplify fractional factors by using the greatest common factor. • Use a model to show division of fractions. • Use compatible numbers to estimate quotients of

	<p>fractions and mixed numbers.</p> <ul style="list-style-type: none"> • Understand positive and negative numbers and use them to represent real world quantities. • Compare and order integers. • Plot rational numbers on a number line and use a number line to identify opposites. • Compare and order rational numbers
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Multiply and divide whole numbers with grid paper. 2. Model decimals in tenths and hundredths using colored pencils. 3. Relate mixed numbers and fractions greater than 1 using fraction circles. 4. Use fraction strips to model and use benchmark fractions. 5. Plot ordered pairs in the first quadrant of a coordinate plane. 	Chapter 1 Chapter 2 Chapter 3
Websites	
<p>Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides</p>	<p>www.khanacademy.org www.funbrain.com www.coolmath.com http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/the-number-system http://www.mathchimp.com/6th-grade-math-games</p>
Suggested Options for Differentiation	

Basic Skills/Economically Disadvantaged/Students at Risk

- 1:1
- Grab and Go centers
- Repeating Directions
- Small Group
- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	✓	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Expressions and Equations	Duration: Approximately 50 Days
NJ Student Learning Standard: 8.EE	
Unit Summary <ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Represent and analyze quantitative relationships between dependent and independent variables. <p>Unit Summary: Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities</p>	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

8.EE.A	Work with radicals and integer exponents.
8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
8.EE.A.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger
8.EE.A.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
8.EE.B	Understand the connections between proportional relationships, lines, and linear equations.
8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .
8.EE.C	Analyze and solve linear equations and pairs of simultaneous linear equations.
8.EE.C.7	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers)

	b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.				
8.EE.C.8	<p>Analyze and solve pairs of simultaneous linear equations.</p> <p>a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.</p> <p>b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.</p> <p>c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.</p>				
	NJ Student Learning Standard for Introduction				
8.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.				
SL.8.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.				
<table border="1"> <thead> <tr> <th>Essential Understandings</th><th>Essential Questions</th></tr> </thead> <tbody> <tr> <td> <p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> Some mathematical situations can be translated and represented using a variable in an algebraic expression. The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculation that results. There is an agreed upon order in which operations are carried out in a numerical expressions. The Distributive Property of Multiplication over Addition lets you multiply a sum by multiplying each addend </td><td> <ul style="list-style-type: none"> How do you write, interpret and use algebraic expressions? How can you use equations and inequalities to represent situations and solve problems? How can you show relationships between variables? </td></tr> </tbody> </table>		Essential Understandings	Essential Questions	<p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> Some mathematical situations can be translated and represented using a variable in an algebraic expression. The value of an algebraic expression can be found by replacing the variable(s) with given number(s) and doing the calculation that results. There is an agreed upon order in which operations are carried out in a numerical expressions. The Distributive Property of Multiplication over Addition lets you multiply a sum by multiplying each addend 	<ul style="list-style-type: none"> How do you write, interpret and use algebraic expressions? How can you use equations and inequalities to represent situations and solve problems? How can you show relationships between variables?
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<p>separately and then finding the sum of the products.</p> <ul style="list-style-type: none"> • Some quantities have a mathematical relationship; the value of one quantity can be found if you know the value of the other quantity. • Patterns can sometimes be used to identify a relationship between two quantities. • Some problems can be solved by recording and organizing data in a table and by finding and using numerical patterns in the table. • Equations can be transformed into equivalent equations and solved using properties of equality and inverse operations. A solution to an inequality is a value that makes the inequality true. 	
<p style="text-align: center;">Evidence of Student Learning</p>	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p style="text-align: center;">Other Assessments</p>
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Tickets • Class work

	<p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Vocabulary	

Exponent, Base, Factor, Numerical Expression, Order of Operations, Evaluate, Algebraic Expression, Variable, Terms, Coefficient, Like Term, Equivalent Expression, Commutative Property, Associative Property, Identity Property, Distributive Property, Equation, Solution to an Equation, Variable, Algebraic Expression, Inverse Operations, Subtraction/Addition Property of Equality, Identity Property of Addition, Division/Multiplication Property of Equality, Identity Property of Multiplication, Inequality, Solution to an Inequality, Independent/Dependent Variable, Linear Equations

Knowledge and Skills

Content

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Skills

Students will be able to ...

- Write and evaluate expressions using exponents.
- Use the order of operations to evaluate expressions using exponents.
- Write algebraic expressions.
- Identify and describe parts of expressions.
- Evaluate algebraic expressions and formulas
- Use algebraic expressions to solve problems.
- Determine whether a number is a solution to an equation.
- Translate between words and equations.
- Use models to solve additional equations, and multiplication equations.
- Use algebra to solve addition, subtraction, multiplication and division equations.
- Determine whether a number is a solution of an inequality.
- Write algebraic inequalities.
- Represent solutions of algebraic inequalities on

	<p>number line diagrams.</p> <ul style="list-style-type: none"> • Write an equation to represent the relationship between and independent and dependent variable. • Translate between equations and tables. • Graph the relationship between two quantities. • Translate between equations and graphs
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Evaluate expressions with grouping symbols using the order of operations. 2. Model multiplication using arrays. 3. Identify parts of an algebraic expression before evaluating. 4. Use models to solve simple one-step equations. 5. Observe the relationship between two number patterns. 6. Use a model to show a rule and observe alternative patterns. 	Chapter 7, Chapter 8, Chapter 9
Math Literature	
<p>Multiplication:</p> <p>Hershey's Kisses by Jerry Pollatta</p> <p>365 Penguins by Jean Luc Fromental</p> <p>The Doorbell Rang by Pat Hutchings</p> <p>Division:</p> <p>Safari Park by Stuart Murphy</p> <p>The Doorbell Rang by Pat Hutchings</p>	

Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kutasoftware.com www.funbrain.com www.coolmath.com http://www.mathchimp.com/6th-grade-math-resources http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/expressions-and-equations http://www.insidemathematics.org/common-core-resources/mathematical-content-standards/standards-by-strand/expressions-and-equations
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) Gifted and Talented <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson 	

- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Geometry	Duration: Approximately 20 Days
NJ Student Learning Standard: 8.G	
Unit Summary • Solve real-world and mathematical problems involving area, volume, and surface area. Unit Summary: Students build on their work with area in elementary school by reasoning about relationships among shapes to determine are surface area, and volume. Try to find the areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles.	

Using these methods, students discuss, develop. And justify formulas for areas of triangle and parallelograms. Students find the areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 8 by drawing polygons in the coordinate plane.

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

8.G.A.	Understand congruence and similarity using physical models, transparencies, or geometry software.
8.G.A.1	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are transformed to lines, and line segments to line segments of the same length. b. Angles are transformed to angles of the same measure. c. Parallel lines are transformed to parallel lines.
8G.A.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
8G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.				
8.G.A.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.				
8.G.B	Understand and apply the Pythagorean Theorem.				
8.G.B.6	Explain a proof of the Pythagorean Theorem and its converse.				
8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in realworld and mathematical problems in two and three dimensions.				
8.G.B.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.				
8.G.C	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.				
8.G.C.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.				
NJ Student Learning Standards for Introduction					
7.G.A.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.				
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.				
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.				
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.				
<table border="1"> <thead> <tr> <th>Essential Understandings</th><th>Essential Questions</th></tr> </thead> <tbody> <tr> <td> <i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and </td><td> <ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures? </td></tr> </tbody> </table>		Essential Understandings	Essential Questions	<i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and 	<ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures?
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<i>Students will understand that.....</i> <ul style="list-style-type: none"> Measurements can be used to describe, compare, and 	<ul style="list-style-type: none"> How can you use measurements to describe two dimensional figures? 				

<p>make sense of real-world situations, including area, volume, and surface area.</p> <ul style="list-style-type: none"> • Geometric properties can be used to construct geometric figures. • Coordinate geometry facilitates the visualization of algebraic relationships 	<ul style="list-style-type: none"> • How can you use measurements to describe three dimensional figures? • How can measurements and geometric relationships be used to solve problems? • How does coordinate geometry illustrate a connection between geometry and algebra?
Evidence of Student Learning	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects Alternative • Assessments • Benchmark Tests • Standardized Tests • Modifications

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Vocabulary	
Area, Parallelogram, Congruent, Diagonals, Right/Acute/Obtuse Triangle, Trapezoid, Regular Polygon, Composite Figure, Volume, Solid Figure, Net Face, Edge, Vertex, Base, Lateral Face, Prism, Pyramid, Polygon	
Knowledge and Skills	
Content:	Skills:
Solve real-world and mathematical problems involving area, volume, and surface area.	<i>Students will be able to ...</i> <ul style="list-style-type: none"> Find the area of parallelograms. Investigate the relationship among the areas of triangles, rectangles and parallelograms. Find the area of triangles. Investigate the relationship between the areas of trapezoids and parallelograms. Find the area of trapezoids. Find the area of regular polygons Make and identify a 3-D figure from a net

	<ul style="list-style-type: none"> • Use nets to find surface area • Show volume as $V=Bh$ and $V=lwh$
Instructional Plan	
Suggested Activities	Resources
<ol style="list-style-type: none"> 1. Find the area of a rectangle with fractional side lengths. 2. Find the perimeter and area of rectangles and squares. 3. Use small unit cubes to find the volume of rectangular prisms. 4. Explore nets by use of different shaped prisms and pyramids. 	Chapter 10 & 11
Math Literature	
<p>Sir Cumference and the Great Knight of Angleland (A Math Adventure) By Cindy Neuschwander-This series explores geometric concepts in an adventurous way.</p> <p>Sir Cumference and the Sword in the Cone: A Math Adventure By Cindy Neuschwander</p> <p>Sir Cumference and the Dragon of Pi (Math Adventures)- Simple tangram story that can be used to review basic geometry terms.</p> <p>Grandfather Tang's Story Ann Tompert- Geometry/tessellation story</p> <p>A Cloak For The Dreamer Aileen Friedman- Shape story</p> <p>The Greedy Triangle Marilyn Burns - Geometry story</p> <p>Flatland Edwin Edwin Abbot</p> <p>Mr. Archimedes' Bath Pamela Allen</p> <p>Who Sank the Boat? Pamela Allen</p>	
Websites	
Interactive arithmetic lessons	www.kutasoftware.com www.khanacademy.org

Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.funbrain.com http://www.math4childrenplus.com/games/geometry/ http://www.adaptedmind.com/categorylist.php?categoryId=6 http://www.kidsmathtv.com/6th-grade-videos/
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> • 1:1 • Grab and Go centers • Repeating Directions • Small Group • Manipulatives • Interactive Notes • Reteach/Enrichment Pages for each lesson (RTI) <p>Gifted and Talented</p> <ul style="list-style-type: none"> • Multi-step problems • Enrichment Lesson • Presentation • Student-driven activities/choices <p>ELL</p> <ul style="list-style-type: none"> • Elicit Prior Knowledge • Rephrase • Understand Context • Scaffold Language • Restate • Cooperative Grouping <p>Special Education/504</p> <ul style="list-style-type: none"> • One on one instruction 	

- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	✓	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.

	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 5: Statistics and Probability	Duration: Approximately 15 Days
NJ Student Learning Standard: 8.SP	
Unit Summary <ul style="list-style-type: none"> • Develop understanding of statistical variability • Summarize and describe distributions Unit Summary: Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.

CRP12	Work productively in teams while using cultural global competence.
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8.SP.A.	Investigate patterns of association in bivariate data.				
8.SP.A.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.				
8.SP.A.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.				
8.SP.A.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.				
8.SP.A.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?				
NJ Student Learning Standard for Introduction					
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.				
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.				
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.				
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<p>analyzing data. The question to be answered determines the data that needs to be collected.</p> <ul style="list-style-type: none"> • Each type of graph is most appropriate for certain kinds of data. A histogram uses bars to compare continuous numerical data grouped into intervals. • Box plots are useful for plotting data above a number line. Box plots show the spread for each quarter of the data. • A set of data collected to answer a statistical question has a • distribution, which can be described by its center, spread, and overall shape 	<ul style="list-style-type: none"> • How can you display data and analyze measures of center? • What are ways data can be represented?
Evidence of Student Learning	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark

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Vocabulary	
Data, Statistical Question, Dot Plot, Frequency, Frequency Table, Relationship Frequency Table, Histogram, Bar Graph Measure of Center, Mean, Median, Mode, Outlier, Lower/Upper Quartile, Box Plot, Absolute, Deviation, Measure of Variability, Range, Interquartile Range, Distribution, Statistical Question	
Knowledge and Skills	
Content:	Skills:
<ul style="list-style-type: none"> • Develop understanding of statistical variability • Summarize and describe distributions of data through 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Recognize statistical questions.

graphing	<ul style="list-style-type: none"> • Describe a data set by stating what quantity was measured and how it was measured. • Use frequency tables and dot plots to organize data. • Display data and histograms. • Understand the mean as a fair share and as a balance point. • Summarize data by using mean, median and mode. • Determine the effect of outliers on measures of center. • Solve problems involving data by using the strategy, "Draw a diagram." • Describe overall pattern in data including, clusters, peak, gaps and symmetry. • Display data and box plots. • Understand mean, absolute deviation as a measure of variability from the mean. • Summarize a data set by using range, interquartile range, and mean absolute deviation. • Choose appropriate measures of center and variability to describe data and justify the choice. • Recognize what measures of center and variability indicate about a data set.
Instructional Plan	
Suggested Activities	Resources
5. Calculate percent based on data. 6. Create and interpret bar graphs.	Chapter 12 Chapter 13

<p>7. Use a dot plot to represent and interpret data.</p> <p>8. Create a dot plot from measurements and perform simple operations on the data.</p>	
Math Literature	
<p>Anno's Hat Tricks, Akihiro Nozaki- Probability</p> <p>Jumanji, Chris Van Allsburg- Probability</p> <p>Martha Blah Blah, Susan Meddaugh- Probability</p> <p>The Phantom Tollbooth, Norton Juster- Data Analysis, Probability</p>	
Websites	
<p>Interactive arithmetic lessons</p> <p>Online Resources</p> <p>Online Videos</p> <p>Interactive Games</p> <p>Games, PowerPoint, Instructional Aides</p>	<p>www.kutasoftware.com</p> <p>www.khanacademy.org</p> <p>www.funbrain.com</p> <p>http://www.internet4classrooms.com/skill_builders/probability_math_sixth_6th_grade.htm</p> <p>http://www.spellingcity.com/statistics-and-probability-middle-school.html</p> <p>https://www.ixl.com/math/grade-6</p>
Suggested Options for Differentiation	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <ul style="list-style-type: none"> ● 1:1 ● Grab and Go centers ● Repeating Directions ● Small Group 	

- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
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Estell Manor School District

Algebra I Curriculum

Standard Alignment September 2017
NJDOE Adoption Date September 2017
EMS BOE Approved October 23, 2019

Statement of Purpose

The New Jersey Student Learning Standards for Mathematics challenges us to ensure focus, coherence, and rigor in our mathematics curriculum across all elementary grade levels. Additionally, through the Standards for Mathematical Practice, students are encouraged to develop the application of math skills while solving real world problems.

To gain a greater focus, the standards place an emphasis on fewer skills, deepening and strengthening the foundations, thus providing students with the knowledge to apply the skills to situations inside and outside of the classroom. Grades 3 – 5 focus on concepts, skills and problem solving related to multiplication and division of whole numbers and fractions. Within our curriculum, focus is maintained by building students' conceptual skills while developing the deeper understanding and real world application.

Coherence is supported by the alignment of the curriculum, instruction, and assessments. The repeated domains, within the standards, progress through the elementary grades to allow for developmentally appropriate attainment of learning outcomes. The curriculum's suggested pacing allows for the important balance of developing conceptual understanding and procedural skills. Instructional decisions are guided by the use of Board approved resources, problem-based learning and real-world applications that incorporate technology and the 21st century skills.

Rigor, as addressed in the standards, has three main components: conceptual understanding, procedural skills and fluency, and application. The curriculum has been designed with this in mind; there is a progression of skills that guide students from the conceptual phase to the application component. Each understanding of the concepts applies to a relevant, real world experience. The Standards for Mathematical Practice guide educators in helping students develop "processes and proficiencies" through problem solving, reasoning and proof, communication, representations, and connections, adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition. From these standards, each instructional cycle focuses on a few to enable students to develop deeper understanding.

The Standards for Mathematical Practice describe ways in which developing student practitioners, of the discipline of

mathematics, increasingly promote engagement with the subject matter as they grow in mathematical maturity and expertise. This is supported through the scope and sequence of the curriculum.

Many of the concepts presented in Algebra I are progressions of concepts that were introduced in grades 6 through 8. The content presented in this course is intended to extend and deepen the previous understandings.

- Unit 1 begins with setting the stage for work with expressions and equations through understanding quantities and the relationships between them.
- Unit 2 will build on the grade 8 concepts for linear and exponential relationships. Success in This unit will lay the groundwork for later units where the students will extend this knowledge to quadratic and exponential functions.
- Unit 3 blends the conceptual understandings of expressions and equations with procedural fluency and problem solving. The students will not encounter solutions of quadratic equations that are complex.
- Unit 4 presents standards that involve functions and extending the concepts of integer exponents to concepts of rational exponents. The understandings will be applied to other types of equations in future courses.
- Unit 5 will build on previous work with descriptive statistics. Linear models will be used to assess how a model fits the data

Suggested Pacing Guide

Unit	Unit Length
Unit 1: Relationships Between Quantities and Reasoning with Equations	Approximately 45 Days
Unit 2: Linear Relationships	Approximately 50 Days
Unit 3: Expressions and Equations	Approximately 40 Days
Unit 4: Functions and Modeling	Approximately 20 Days
Unit 5: Descriptive Statistics	Approximately 15 Days

Primary Interdisciplinary Connections: Science, Social Studies, Language Arts, Technology, and 21st Century Life and Careers. For further clarification see New Jersey Student Learning Standards at <http://www.nj.gov/education/cccs/>

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Supporting Mathematical Practices through Questioning

Practice 1: Make sense of problems and persevere in solving them	<ul style="list-style-type: none">● What is the problem asking?● How will you use that information?● What other information do you need?● Why did you choose that operation?● What is another way to solve that problem?
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	<ul style="list-style-type: none"> • What did you do first? Why? • What can you do if you don't know how to solve a problem? • Have you solved a problem like this one? • When did you realize your first method would not work? • How do you know your answer makes sense?
Practice 2: Reason abstractly and quantitatively	<ul style="list-style-type: none"> • What is a situation that could be represented by this equation? • What operation did you use to represent the situation • Why does that operation represent the situation? • What properties did you use to find the answer? • How do you know the answer is reasonable?
Practice 3: Construct viable arguments and critique the reasoning of others	<ul style="list-style-type: none"> • Will that method always work? • How do you know? • What do you think about what the other student said? • Who can tell us about a different method? • What do you think will happen if ...? • When would that not be true? • Why do you agree/disagree with what the other student said? • What do you want to ask the other student about that method? • How does that drawing support your work?
Practice 4: Model with mathematics	<ul style="list-style-type: none"> • Why is that a good model for this problem? • How can you use a simpler problem to help you find the answer? • What conclusions can you make from your model? • How would you change your model if...?
Practice 5: Use appropriate tools strategically	<ul style="list-style-type: none"> • What could you use to help you solve the problem? • What strategy could you use to make the calculation easier? • How would estimation help you solve that problem? • Why did you decide to use...?
Practice 6: Attend to precision	<ul style="list-style-type: none"> • How do you know your answer is reasonable? • How can you use math vocabulary in your answer?

	<ul style="list-style-type: none"> • How do you know those answers are equivalent? • What does that mean?
Practice 7: Look for and make use of structure	<ul style="list-style-type: none"> • How did you discover the pattern? • What other patterns can you find? • What rule did you use to make this group? • Why can you use that property in this problem? • How is that like...?
Practice 8: Look for and express regularity in repeated reasoning	<ul style="list-style-type: none"> • What do you remember about...? • What happens when...? • What if you...instead of...? • What might be a shortcut for...?

Adopted from Houghton Mifflin Harcourt

Mathematical Practices Rubric

Mathematical Practice	4	3	2	1
MP #1	Made sense of problems, evaluated approaches, and persevere in solving them.	Made sense of problems and persevere in solving them.	Made sense of problems.	With support, made sense of problems.
MP #2	Dug deeply into a problem to analyze and reason abstractly and quantitatively.	Reasoned abstractly and quantitatively.	Represented a complex problem mathematically.	Represented a basic problem mathematically.
MP #3	Analyzed situations, breaking them into cases	Constructed viable arguments and critique	Constructed viable arguments.	Compared arguments.

	and building a logical argument with counter-examples. Communicated ideas and responded to others. Provided critique and feedback to others.	the reasoning of others.		
MP #4	Analyzed complex relationships mathematically to solve problems.	Made assumptions and approximations to simplify complex problems.	Applied reasoning to plan an event or solve a problem.	Wrote an equation to describe a situation.
MP #5	Used appropriate tools strategically to solve problems and display solutions.	Used appropriate tools strategically.	Identified available tools to solve a problem and when to use them.	Identified available tools to solve a problem.
MP #6	Attends to precision and details when calculating and communicating. Examined details of claims and made explicit use of definitions.	Attends to precision and details when calculating and communicating.	Where accurate when calculating and communicating.	Where clear when calculating and communicating.
MP #7	Recognized complex patterns and could see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. Applied patterns	Recognized complex patterns and used those to solve problems.	Recognized complex patterns.	Recognized patterns.

	to solve problems.			
MP #8	Maintained oversight of the whole process while paying attention to details. Continued to evaluate the reasonableness of intermediate results.	Looked for and expressed regularity in repeated reasoning. Found general methods or shortcuts.	Found methods that can be used in multiple applications.	Identified efficient methods in solving some problems.

Unit 1 will address the following 21st Century Life and Careers skills:				
Check all that apply 21 st Century Themes			Career Ready Practices	
9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.

	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.

	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 3: Functions	Duration: Approximately 40 Days
NJ Student Learning Standard: 8.F	
Unit Summary <ul style="list-style-type: none"> Understand concept of functions and use that reasoning to evaluate and compare functions and the relationship between quantities. 	

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.

CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

Unit 1: Relationships Between Quantities and Reasoning with Equations

Reason quantitatively and use units to solve problems.	N.Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
	N.Q.2	Define appropriate quantities for the purpose of descriptive modeling.
	N.Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Interpret the structure of expressions. * A.SSE.1: focus on linear, quadratic, and an introduction to exponential expressions	A.SSE.1	Interpret expressions that represent a quantity in terms of its context. ★ Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. <i>For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.</i>
Create equations that describe numbers or relationships.	A.CED.1**	Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear functions.</i>
	A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	A.CED.4***	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.</i>

<p>A.CED.1 is <i>limited</i> to quadratic equations.</p> <p>*** A.CED.4 <i>excludes</i> cases that require extraction of roots or inverse functions.</p>		
Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
Solve equations and inequalities in one variable.	A.REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
8.1 Educational Technology:	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.	
A. Technology Operations and Concepts	The use of technology and digital tools requires knowledge and appropriate use of operations and related applications.	
9.1 21st Century Life Skills:	All students will demonstrate creative, critical thinking, collaboration and problem solving skills to function successfully as global citizens and workers in diverse ethnic and organizational cultures.	
B. Creativity and Innovation:	Brainstorming activities enhance creative and innovative thinking in individual and group goal setting and problem solving.	
SL.7.1.B	Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.	
8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.	

Evidence of Student Learning	
<p>Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.</p>	Other Assessments
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Card Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects Alternative • Assessments • Benchmark Tests • Standardized Tests • Modifications
	<p>Benchmark Assessment</p>

- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 2 will address the following 21st Century Life and Careers skills:

Check all that apply
21st Century Themes

Career Ready Practices

9.1	Personal Financial Literacy		√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers		√	CRP2. Apply appropriate academic and technical skills.
	Money Management			CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management		√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing			CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer		√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.

X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 2: Linear Relationships	Duration: Approximately 45 Days
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21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.

CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

Solve systems of equations.	A.REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
	A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Represent and solve equations and inequalities graphically.	A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
	A.REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., by using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★
	A..REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Create equations that describe numbers or relationships.	A.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i>
Understand the concept of a function and use function notation.	F.IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
	F.IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

	F.IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. <i>For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.</i>
Interpret functions that arise in applications in terms of the context.	F.IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. <i>For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.</i> ★
Analyze functions using different representations.	F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★ Graph linear and quadratic functions and show intercepts, maxima, and minima.
	F.IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</i>
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Evidence of Student Learning		
Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.		Other Assessments
		Formative Assessments <ul style="list-style-type: none"> • Oral Questioning • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation • Exit Tickets • Class work

	<p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Untimed Fact Practice Assessment • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Websites	
<p>Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides</p>	<p>www.khanacademy.org www.studyisland.com HMH math online resources</p>
Suggested Options for Differentiation	

Basic Skills/Economically Disadvantaged/Students at Risk

- 1:1
- Grab and Go centers
- Repeating Directions
- Small Group
- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 3 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.

	Civic Financial Responsibility			CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
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8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.
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Unit 3: Expressions and Equations	Duration: Approximately 50 Days

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

Interpret the structure of expressions.	A.SSE.1*	Interpret expressions that represent a quantity in terms of its context. ★ Interpret parts of an expression, such as terms, factors, and coefficients. Interpret complicated expressions by viewing one or more of their parts as a single entity. <i>For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.</i>
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<p>A.SSE.1: focus on linear, quadratic, and an introduction to exponential expressions.</p> <p>** A.SSE.2: focus on polynomial expressions.</p>	A.SSE.2**	Use the structure of an expression to identify ways to rewrite it. <i>For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares, that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</i>
<p>Write expressions in equivalent forms to solve problems.</p> <p>*** A.SSE.3 is limited to real numbers.</p>	A.SSE.3***	<p>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★</p> <p>Factor a quadratic expression to reveal the zeros of the function it defines.</p> <p>Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</p> <p>Use the properties of exponents to transform expressions for exponential functions. <i>For example, the expression $1.15t$ can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.</i></p>
Perform arithmetic operations on polynomials.	A.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Create equations that describe numbers or relationships.	A.CED.1	Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i>
	A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.</i>
Solve equations and inequalities in one variable.	A.REI.4	<p>Solve quadratic equations in one variable.</p> <p>Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.</p> <p>Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.</p>
Evidence of Student Learning		

Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Tickets • Class work <p>Summative Assessments</p> <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark • Assessments • Projects • Alternative Assessments • Benchmark Tests • Standardized Tests • Modifications <p>Benchmark Assessment</p>

	<ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.khanacademy.com www.studyisland.com HMH online resources
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> 1:1 Grab and Go centers Repeating Directions Small Group 	

- Manipulatives
- Interactive Notes
- Reteach/Enrichment Pages for each lesson (RTI)

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 4 will address the following 21st Century Life and Careers skills:

Check all that apply 21st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.
	Income and Careers	√	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	√	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	√	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.

	Insuring and Protecting		√	CRP8.Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation			CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness			CRP10. Plan education and career paths aligned to personal goals.
	Career Exploration		√	CRP11. Use technology to enhance productivity.
	Career Preparation		√	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 4: Functions and Modeling	Duration: Approximately 20 Days
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21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.
CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

Understand the relationship between zeros and factors of polynomials.	A.APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Extend the properties of exponents to rational exponents.	N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.</i>
	N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
	N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a non-zero rational number and an irrational number is irrational.
	F.IF.4*	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the

<p>Interpret functions that arise in applications in terms of the context.</p> <p>F.IF.4 and F.IF.5 are limited to linear and quadratic functions.</p>		relationship. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> ★
	F.IF.5*	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. <i>For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.</i> ★
	F.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
Analyze functions using different representations.	F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★ Graph linear and quadratic functions and show intercepts, maxima, and minima. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
<p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>** F.IF.9 is limited to linear and quadratic functions.</p>	F.IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. Use the properties of exponents to interpret expressions for exponential functions. <i>For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.</i>
	F.IF.9**	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</i>
<p>Build a function that models a relationship between two quantities.</p> <p>*** F.BF.1 is limited to linear and quadratic functions.</p>	F.BF.1***	Write a function that describes a relationship between two quantities. ★ a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
Build new functions from existing functions.	F.BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. <i>Include recognizing even and odd functions from their graphs and algebraic expressions for them.</i>
Construct and compare linear, quadratic, and exponential models and solve problems.	F.LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals; and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative another.
	F.LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

	F.LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Interpret expressions for functions in terms of the situation they model.	F.LE.5	Interpret the parameters in a linear or exponential function in terms of a context.
Evidence of Student Learning		
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>		Formative Assessments <ul style="list-style-type: none"> • Oral Questioning • Choral Response • Partners • Student Conference • Self-Assessment • Think-Pair-Share • Hand Signals • Peer Reflection • Graphic Organizers • Constructive Response • Teacher Observation Exit Card Tickets • Class work Summative Assessments <ul style="list-style-type: none"> • Chapter Tests • Quizzes • Benchmark Assessments • Projects Alternative • Assessments • Benchmark Tests • Standardized Tests • Modifications Benchmark Assessment

	<ul style="list-style-type: none"> GoMath Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> Untimed Fact Practice Assessment Manipulative Driven Assessment Modified/Teacher Created Chapter Tests Modified/Teacher Created Mid-Chapter Quiz Visual Representation of Skills Assess Modified Classwork Assignments Modified Benchmarks GoMath Reteach Activities and Worksheets Project Based Assessments with Scoring Rubric
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.kahnacademy.com www.studyisland.com HMH Online math resources
Suggested Options for Differentiation	
Basic Skills/Economically Disadvantaged/Students at Risk <ul style="list-style-type: none"> 1:1 Grab and Go centers Repeating Directions Small Group Manipulatives Interactive Notes Reteach/Enrichment Pages for each lesson (RTI) 	

Gifted and Talented

- Multi-step problems
- Enrichment Lesson
- Presentation
- Student-driven activities/choices

ELL

- Elicit Prior Knowledge
- Rephrase
- Understand Context
- Scaffold Language
- Restate
- Cooperative Grouping

Special Education/504

- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Follow all IEP modifications/504 plan
- Provide manipulatives or the opportunity to draw solution strategies

Unit 5 will address the following 21st Century Life and Careers skills:

Check all that apply 21 st Century Themes		Career Ready Practices	
9.1	Personal Financial Literacy	√	CRP1. Act as a responsible and contributing citizen and employee.

	Income and Careers	✓	CRP2. Apply appropriate academic and technical skills.
	Money Management		CRP3. Attend to personal health and financial well-being.
	Credit and Debt Management	✓	CRP4. Communicate clearly and effectively and with reason.
X	Planning, Saving, and Investing		CRP5. Consider the environmental, social and economic impacts of decisions.
	Becoming a Critical Consumer	✓	CRP6. Demonstrate creativity and innovation.
	Civic Financial Responsibility		CRP7. Employ valid and reliable research strategies.
	Insuring and Protecting	✓	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
9.2	Career Awareness, Exploration, and Preparation		CRP9. Model integrity, ethical leadership and effective management.
X	Career Awareness		CRP10. Plan education and career paths aligned to personal goals.

	Career Exploration	✓	CRP11. Use technology to enhance productivity.
	Career Preparation	✓	CRP12. Work productively in teams while using cultural global competence.

Technology

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.B.1	Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Unit 5: Descriptive Statistics	Duration: Approximately 15 Days

21st Century Life and Careers	
CRP1	Act as a responsible and contributing citizen and employee.
CRP2	Apply appropriate academic and technical skills.

CRP4	Communicate clearly and effectively and with reason.
CRP6	Demonstrate creativity and innovation.
CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11	Use technology to enhance productivity.
CRP12	Work productively in teams while using cultural global competence.

Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
	S.ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
	S.ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
	S.ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
Summarize, represent, and interpret on two categorical and quantitative variables.	S.ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
	S.ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. <i>Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.</i> Informally assess the fit of a function by plotting and analyzing residuals. Fit a linear function for a scatter plot that suggests a linear association.
Interpret linear models.	S.ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
	S.ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
	S.ID.9	Distinguish between correlation and causation.

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	<ul style="list-style-type: none"> • Manipulative Driven Assessment • Modified/Teacher Created Chapter Tests • Modified/Teacher Created Mid-Chapter Quiz • Visual Representation of Skills Assess • Modified Classwork Assignments • Modified Benchmarks • GoMath Reteach Activities and Worksheets • Project Based Assessments with Scoring Rubric
Websites	
Interactive arithmetic lessons Online Resources Online Videos Interactive Games Games, PowerPoint, Instructional Aides	www.khanacademy.com www.studyisland.com HMH online Math resources
Suggested Options for Differentiation	
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