

Eagleswood Township Elementary School District

Grade: 3	Content Area: Mathematics
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Standard Alignment September 2017	NJDOE Adoption Date September 2017
Revise December 2021	ETESD BOE Approved 1/2021

Suggested Pacing Guide

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

Core Materials:

GoMath
Linkit
Reflex Math

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: Number and Operations in Base Ten	Duration: 35
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<u>Career Readiness, Life Literacies, and Key Skills Practices</u>	
Act as a responsible and contributing community members and employee.	Students understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

<p>Consider the environmental, social and economic impacts of decisions.</p>	<p>Students understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.</p>
<p>Demonstrate creativity and innovation.</p>	<p>Students regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.</p>
<p>Utilize critical thinking to make sense of problems and persevere in solving them.</p>	<p>Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.</p>
<p>Model integrity, ethical leadership and effective management.</p>	<p>Students consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the</p>

	near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.
Plan education and career paths aligned to personal goals.	Students take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.
Use technology to enhance productivity, increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Unit 1: Number and Operations in Base Ten	Duration: 35
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Career Readiness, Life Literacies, and Key Skills

Addressed In This Unit

9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

9.1.2. FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).

9.1.2.FP.2: Differentiate between financial wants and needs.

9.1.2.FP.2: Differentiate between financial wants and needs.

9.1.2.PB.2: Explain why an individual would choose to save money.

9.1.2.RM.1: Describe how valuable items might be damaged or lost and ways to protect them.

9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6)

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process

9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g.,

8.1.5.NI.2).9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). • 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.

Computer Science and Design Thinking

Computing Systems

By the end of grade 5

Computing devices may be connected to other devices to form a system as a way to extend their capabilities.

Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information)

Shared features allow for common troubleshooting strategies that can be effective for many systems.

Networks and the Internet

Information needs a physical or wireless path to travel to be sent and received.

Distinguishing between public and private information is important for safe and secure online interactions.

Information can be protected using various security measures (i.e., physical and digital)

Impacts of Computing

The development and modification of computing technology is driven by people's needs and wants and can affect individuals differently.

Data & Analysis

Data can be organized, displayed, and presented to highlight relationships

The type of data being stored affects the storage requirements.

Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.

Many factors influence the accuracy of inferences and predictions.

Algorithms & Programming

Different algorithms can achieve the same result.

Some algorithms are more appropriate for a specific use than others.

Programming languages provide variables, which are used to store and modify data.

A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)

Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.

Individuals develop programs using an iterative process involving design, implementation, testing, and review.

Engineering Design

Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge.

Often, several design solutions exist, each better in some way than the others.

Engineering design requirements include desired features and limitations that need to be considered.

Interaction of Technology and Humans

Societal needs and wants determine which new tools are developed to address real-world problems.

A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.

Technology spurs new businesses and careers.

Nature of Technology

Technology innovation and improvement may be influenced by a variety of factors.

Engineers create and modify technologies to meet people’s needs and wants; scientists ask questions about the natural world.

Effects of Technology on the Natural World

The technology developed for the human designed world can have unintended consequences for the environment.

Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.

Ethics & Culture

Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Correlation Key		
Holocaust	Amistad	Financial Literacy

Unit 1: Number and Operations in Base Ten	Duration: September – October, Ongoing
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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)

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).
Computer Science and Design Thinking	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.1.5.NI.2:	Describe physical and digital security measures for protecting sensitive personal information.

8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
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>Amusement Park Debacle:</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</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>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>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 ● Linkit! Math <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>Mathematical Practices</p>	
<p>MP 2: Reason Abstractly and Quantitatively</p> <p>MP 3: Construct Viable Arguments & Critique the Reasoning of Other</p>	
<p>Vocabulary</p>	
<p>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</p>	
<p>Knowledge and Skills</p>	

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"> Round numbers to the nearest 10 and 100 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

<p>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.</p>	<p>Everyday math number cards</p>
<p>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.</p>	<p>Grocery Store Circular (i.e. ShopRite)</p>
<p>Multiples of 10 Shopping list- Students are given a shopping list and have to purchase enough items for the class.</p>	<p>Store Circular (CVS, Walmart, etc.)</p>
<p>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.</p>	<p>Index cards with various numbers on each</p>
<p>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.</p>	<p>Sentence strips with place value names written on them, magnets for the back of sentence strips, white board, expo markers</p>
<p>Vocabulary Activity - Students will compare and contrast vocabulary words that they can use as clues to determine if they are solving an 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)</p>	<p>T-chart or venn diagram, list of vocabulary words, sample word problems to practice this skill with</p>
<p>Math Literature</p>	

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

- Provide differentiated instruction as needed
- Follow all IEP modifications
- 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

504

- Follow all 504 Plan modifications
- Seat the student away from distractions and in close proximity to the teacher
- Use simple, concise instructions with concrete steps
- Use a timer to assist student to focus on given task or number of problems in time allotted. Stress that problems need to be correctly done
- Pre-teach and/or re-teach important concepts
- Vary kind of instructional materials used
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace

Unit 2: Operations and Algebraic Thinking

Duration: 35 Days

Career Readiness, Life Literacies, and Key Skills

Addressed In This Unit

9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

9.1.2. FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).

9.1.2.FP.2: Differentiate between financial wants and needs.

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9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).

9.2.5.CAP.2: Identify how you might like to earn an income.

9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification

9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).

9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).

9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.

9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.1.5.5.CR3a).
 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

Computer Science and Design Thinking
<i>Computing Systems</i>
<i>By the end of grade 5</i>
Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
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Shared features allow for common troubleshooting strategies that can be effective for many systems.
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Information can be protected using various security measures (i.e., physical and digital)
<i>Impacts of Computing</i>
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A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.
Technology spurs new businesses and careers.
<i>Nature of Technology</i>
Technology innovation and improvement may be influenced by a variety of factors.
Engineers create and modify technologies to meet people’s needs and wants; scientists ask questions about the natural world.
<i>Effects of Technology on the Natural World</i>
The technology developed for the human designed world can have unintended consequences for the environment.
Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.
Ethics & Culture
Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Correlation Key		
Holocaust	Amistad	Financial Literacy

Unit 2: Operations and Algebraic Thinking	Duration: October – December
NJ Student Learning Standard: 3.OA	

Unit Summary

- 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)

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.	
	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).	
	Computer Science and Design Thinking	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.	
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.	
8.1.5.NI.2:	Describe physical and digital security measures for protecting sensitive personal information.	
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.	
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.	
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.	
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. 		<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?

<ul style="list-style-type: none"> Numbers are able to represent quantity, position, location, and relationships, and symbols may be used to express these relationships. 	
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p><u>5k for a Charity</u></p> <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 Map out 3.1kilometers route that will be taken for the run 	<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"> Tests Quizzes National/State/District Wide Assessments <p>Benchmark Assessment</p> <ul style="list-style-type: none"> GoMath Benchmark Assessment Linkit assessment B

<p>Vacation Budget</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. 	<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>Mathematical Practice</p>	
<p>MP1: Make sense of Problems and Persevere in Solving Them</p> <p>MP 4: Model with Mathematics</p> <p>MP 6: Attend to precision</p> <p>MP 7: Look for and Make use of Structure</p>	
<p>Vocabulary</p>	
<p>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</p>	

Knowledge and Skills

Content	Skills
<p>Cluster:</p> <ul style="list-style-type: none"> ● 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 <p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● 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 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> ● 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 x 0 to 9 x 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
 - Choose a strategy and solve
 - Does the answer make sense
 - Choose a strategy to solve a problem:
 - Picture Models
 - Arrays
 - Open Number Lines
 - Bar Models (Tape Diagrams)
 - Choose an operation
 - Guess and Check
 - Make a table or an organized list

	<ul style="list-style-type: none"> ● 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 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)
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	
Multiplication: <ul style="list-style-type: none"> ● <u>Hershey's Kisses</u> by Jerry Pollatta Division: <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
https://www.mathgames.com/money	Math money games
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

- 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

504

- Follow all 504 Plan modifications
- Seat the student away from distractions and in close proximity to the teacher
- Use simple, concise instructions with concrete steps
- Use a timer to assist student to focus on given task or number of problems in time allotted. Stress that problems need to be correctly done
- Pre-teach and/or re-teach important concepts
- Vary kind of instructional materials used
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace

Unit 3: Number and Operations—Fractions

Duration:35 days

Career Readiness, Life Literacies, and Key Skills

Addressed In this Unit

- 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
- 9.1.2. FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
- 9.1.2.FP.2: Differentiate between financial wants and needs.
- 9.1.2.RM.1: Describe how valuable items might be damaged or lost and ways to protect them.
- 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
- 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
- 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).
- 9.2.5.CAP.2: Identify how you might like to earn an income.
- 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification
- 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.
- 9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

- 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
- 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.
- 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
- 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
- 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.1.5.5.CR3a).
- 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

Computer Science and Design Thinking
<i>Computing Systems</i>
<i>By the end of grade 5</i>
Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information)
Shared features allow for common troubleshooting strategies that can be effective for many systems.
<i>Networks and the Internet</i>
Information needs a physical or wireless path to travel to be sent and received.
Distinguishing between public and private information is important for safe and secure online interactions.
Information can be protected using various security measures (i.e., physical and digital)

<i>Impacts of Computing</i>
The development and modification of computing technology is driven by people's needs and wants and can affect individuals differently.
<i>Data & Analysis</i>
Data can be organized, displayed, and presented to highlight relationships
The type of data being stored affects the storage requirements.
Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
Many factors influence the accuracy of inferences and predictions.
<i>Algorithms & Programming</i>
Different algorithms can achieve the same result.
Some algorithms are more appropriate for a specific use than others.
Programming languages provide variables, which are used to store and modify data.
A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)
Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.
Individuals develop programs using an iterative process involving design, implementation, testing, and review.
<i>Engineering Design</i>
Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge.

Often, several design solutions exist, each better in some way than the others.

Engineering design requirements include desired features and limitations that need to be considered.

Interaction of Technology and Humans

Societal needs and wants determine which new tools are developed to address real-world problems.

A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.

Technology spurs new businesses and careers.

Nature of Technology

Technology innovation and improvement may be influenced by a variety of factors.

Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.

Effects of Technology on the Natural World

The technology developed for the human designed world can have unintended consequences for the environment.

Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.

Ethics & Culture

Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Correlation Key

Holocaust	Amistad	Financial Literacy
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Unit 3: Number and Operations - Fractions	Duration: 35 days
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NJ Student Learning Standard: 3.NF

<p>Unit Summary</p> <ul style="list-style-type: none"> • Develop understanding of fractions as numbers <p>Unit Summary:</p> <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)

NJ Student Learning Standard: 3.NF	
A.	Develop understanding of fractions as numbers.

3.NF.1	Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
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 $1/b$ 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 $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.</p> <p>b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number 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., $1/2 = 2/4$, $4/6 = 2/3$). 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 $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</p> <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.</p>
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 $62/100$; 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.
	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).
	Computer Science and Design Thinking
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.1.5.NI.2:	Describe physical and digital security measures for protecting sensitive personal information.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
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?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
What's on the Menu	Formative Assessments

- 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

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.

★ Variations: Students determine 3 items for a well-balanced nutritious menu which includes soup (appetizer), main entree, and a dessert. The meals must be traditional African American Meals

(see <https://africanamericancultureslp.weebly.com/food.html>)

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

Summative Assessments

- Go Math Tests
- Go Math Quizzes
- National/State/District Wide Assessments

Benchmark Assessment

- Go Math Benchmark Assessment
- Linkit! Math

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
- 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:

- Develop understanding of fractions as numbers: Chapters 8, 9

Students will know...

- 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

Students will be able to ...

- 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.

- 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. Use traditional Hebrew dishes https://tasty.co/article/deenashanker/make-bubbe-proud	Provide recipes for favorite desserts, beverages, meals, etc.
Math Literature	
Fractions <ul style="list-style-type: none"> ● Fraction Fun by David Adler ● Give Me Half! By Stuart Murphy ● Clean Sweep Campers by Lucille Recht Penner ● Hershey's Fractions Book 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

- 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

504

- Follow all 504 Plan modifications
- Seat the student away from distractions and in close proximity to the teacher
- Use simple, concise instructions with concrete steps
- Use a timer to assist student to focus on given task or number of problems in time allotted. Stress that problems need to be correctly done
- Pre-teach and/or re-teach important concepts
- Vary kind of instructional materials used
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace

Unit 4: Measurement and Data**Duration: 35 days****Career Readiness, Life Literacies, and Key Skills****Addressed In this Unit**

- 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
- 9.1.2. FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
- 9.1.2.FP.2: Differentiate between financial wants and needs.
- 9.1.2.RM.1: Describe how valuable items might be damaged or lost and ways to protect them.
- 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
- 9.1.5.PB.1: Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.
- 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate).
- 9.2.5.CAP.2: Identify how you might like to earn an income.
- 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification
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- 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
- 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).

9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).

Computer Science and Design Thinking

Computing Systems

By the end of grade 5

Computing devices may be connected to other devices to form a system as a way to extend their capabilities.

Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information)

Shared features allow for common troubleshooting strategies that can be effective for many systems.

Networks and the Internet

Information needs a physical or wireless path to travel to be sent and received.

Distinguishing between public and private information is important for safe and secure online interactions.

Information can be protected using various security measures (i.e., physical and digital)

Impacts of Computing

The development and modification of computing technology is driven by people's needs and wants and can affect individuals differently.

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Data can be organized, displayed, and presented to highlight relationships

The type of data being stored affects the storage requirements.

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Many factors influence the accuracy of inferences and predictions.

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Different algorithms can achieve the same result.

Some algorithms are more appropriate for a specific use than others.

Programming languages provide variables, which are used to store and modify data.

A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals)

Programs can be broken down into smaller parts to facilitate their design, implementation, and review. Programs can also be created by incorporating smaller portions of programs that already exist.

Individuals develop programs using an iterative process involving design, implementation, testing, and review.

Engineering Design

Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge.

Often, several design solutions exist, each better in some way than the others.

Engineering design requirements include desired features and limitations that need to be considered.

Interaction of Technology and Humans

Societal needs and wants determine which new tools are developed to address real-world problems.
A new tool may have favorable or unfavorable results as well as both positive and negative effects on society.
Technology spurs new businesses and careers.
<i>Nature of Technology</i>
Technology innovation and improvement may be influenced by a variety of factors.
Engineers create and modify technologies to meet people’s needs and wants; scientists ask questions about the natural world.
<i>Effects of Technology on the Natural World</i>
The technology developed for the human designed world can have unintended consequences for the environment.
Technology must be continually developed and made more efficient to reduce the need for nonrenewable resources.
Ethics & Culture
Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Correlation Key		
Holocaust	Amistad	Financial Literacy

Unit 4: Measurement and Data	Duration: 35 days
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	Use digital tools

	<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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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	Recognize area as an attribute of plane figures and understand concepts of area measurement.

	<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> <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.</p>
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).
Computer Science and Design Thinking	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.1.5.NI.2:	Describe physical and digital security measures for protecting sensitive personal information.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
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. 	<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?

<ul style="list-style-type: none"> Measurements can be used to describe, compare, and 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
<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 Design a zoo map guide that represents their zoo's layout. 	<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 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 ● 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	
<p>MP 2: Reason Abstractly and Quantitatively</p> <p>MP 5: Use appropriate tools strategically</p> <p>MP6: Attend to Precision</p>	
Vocabulary	
<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>	
Knowledge and Skills	
Content	Skills

Cluster:

- 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

Students will know...

- 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

Students will be able to ...

- 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
- Find area of rectangles using manipulatives or counting by squares in an array

	<ul style="list-style-type: none"> ● 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	
<p>Time:</p> <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 <p>Graphing:</p> <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/preview.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	
<p>Basic Skills/Economically Disadvantaged/Students at Risk</p> <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 	
<p>English Language Learners</p> <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

- Follow all IEP modifications
- One on one instruction
- Adaptive devices
- Provide differentiated instruction as needed
- Provide manipulatives or the opportunity to draw solution strategies
- Provide differentiated instruction as needed
- Open Number Line
- Array

504

- Follow all 504 Plan modifications
- Seat the student away from distractions and in close proximity to the teacher
- Use simple, concise instructions with concrete steps
- Use a timer to assist student to focus on given task or number of problems in time allotted. Stress that problems need to be correctly done
- Pre-teach and/or re-teach important concepts
- Vary kind of instructional materials used
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace

Unit 5: Unit 5; Geometry**Duration: 35 Days****Career Readiness, Life Literacies, and Key Skills****Addressed In this Unit**

9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

9.1.2. FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).

9.2.5.CAP.2: Identify how you might like to earn an income.

9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification

9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers.

9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).

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- 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
- 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.
- 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
- 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
- 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.1.5.5.CR3a).
- 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
- 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d)

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Correlation Key		
Holocaust	Amistad	Financial Literacy

Unit 5: Geometry	Duration: 35 days
NJ Student Learning Standard: 3.G	
Unit Summary	
<ul style="list-style-type: none"> Reason with shapes and their attributes. <p>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.</p>	

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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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).
Computer Science and Design Thinking	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
8.1.5.NI.2	Describe physical and digital security measures for protecting sensitive personal information.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
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>	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Teacher Observation • Performance Assessments • Exit Slips

- 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.
- Plan and plot as to where these geometric buildings should be laid out.
- Design a descriptive brochure that represents Manahawkin.

- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Portfolio/Math Journals Daily
- Daily Classwork
- Pre-assessments

Summative Assessments

- Go Math Tests
- Go Math Quizzes
- National/State/District Wide Assessments
- EOY Benchmark

Benchmark Assessment

- Go Math Benchmark Assessment
- Linkit! Math

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
- 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/
Students view Holocaust monuments and identify shapes and angles.	https://www.dezeen.com/2017/10/02/studio-libeskind-com-pletes-national-holocaust-monument-ottawa-canada/ and https://www.dezeen.com/2017/10/02/studio-libeskind-com-pletes-national-holocaust-monument-ottawa-canada
Math Literature	

Shapes:

- When a Line Bends . . . A Shape Begins by Rhonda Gowler
- Greene Shapes, Shapes, Shapes by Tanya Hoban
- Cubes, Cones, Cylinders, & Spheres by Tanya Hoban
- Lines, Segments, Rays, and Angles by Claire Piddick
- The Sir Cumference Series by Cindy Neuschwander & Wayne Geehan
- **Counting the Stars: The Story of Katherine Johnson, NASA Mathematician** by Lesa Cline-Ransome

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

- Provide a checklist of shapes
- Provide logos to locate shapes
- Differentiate the shapes used
- 2-digit by one factors
- Math on the Spot Tutorial
- *Do The Math* Intervention
- Small group instruction
- Manipulatives

English Language Learners

- 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

- 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

- 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

504

- Follow all 504 Plan modifications
- Seat the student away from distractions and in close proximity to the teacher
- Use simple, concise instructions with concrete steps
- Use a timer to assist student to focus on given task or number of problems in time allotted. Stress that problems need to be correctly done
- Pre-teach and/or re-teach important concepts
- Vary kind of instructional materials used
- Simplify and repeat instructions about in-class and homework assignments
- Vary instructional pace