



Grade 6 Mathematics Curriculum

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. Over the last twenty years, New Jersey's academic standards have laid the foundation for local district curricula that is used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages**

The most recent review and revision of the standards occurred in 2014. However, the standards in language arts and math underwent an additional review in 2015 with adoption by the New Jersey State Board of Education in May 2016.

Cape May City Elementary School District Grade 6 Mathematics Curriculum			
Content Area: Mathematics			
Course Title: Grade 6 Mathematics			Grade level: 6
Unit 1: Quarter I		Dates for Unit: September to November	
Unit 2: Quarter II		Dates for Unit: November to February	
Unit 3: Quarter III		Dates for Units: February to April	
Unit 4: Quarter IV		Dates for Units: April to June	
Date Created: 09/17/19		Board Approved On: 10/10/19	

Cape May City Elementary School District Grade 5 Mathematics Curriculum Unit I Overview	
Content Area: Mathematics	
Unit Title: Quarter I	
Target Course/Grade Level: 6	

Unit Summary:

Students will be able to:

- Use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense.
- Use these operations to solve problems.

Interdisciplinary Connections:

- Science, Technology, Social Studies, Health, Social Emotional Learning, English Language/ Arts

21st Century Themes, Skills, and Standards:

- <http://www.state.nj.us/education/cccs/2014/career/>
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.
- Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
- Developing effective communication
- Developing Independent Learning Strategies
- Incorporating Science, Technology, Engineering, and English themes into daily lessons

Learning Targets:

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem

Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.

6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

Ratios and Proportional Relationships

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$ language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a 1rate of \$5 per hamburger.”

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

- a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

CPI

Cumulative Progress Indicators (CPI) for Unit

Performance Task 1

Julianna participated in a walk-a-thon to raise money for cancer research. She recorded the total distance she walked at several different points in time, but a few of the entries got smudged and can no longer be read. The times and distances that can still be read are listed in the table below.

- Assume Julianna walked at a constant speed. Complete the table and plot Julianna's progress in the coordinate plane.
- What was Julianna's walking rate in miles per hour? How long did it take Julianna to walk one mile? Where do you see this information on the graph?
- Write an equation for the distance d , in miles, that Julianna walked in n hours.
- Next year Julianna is planning to walk for seven hours. If she walks at the same speed next year, how many miles will she walk?

Time in hrs	Miles walked
1	
2	6.4
	8
5	

Rubric:

- 4 points – All subcomponent questions are answered correctly
- 3 Points – 3 of 4 subcomponent questions are answered correctly
- 2 Points – 2 of 4 subcomponent questions are answered correctly
- 1 Point – 1 of 4 subcomponent questions are answered correctly
- 0 Points – 0 of 4 subcomponent questions are answered correctly

Unit Enduring Questions:

Questions that will foster inquiry, understanding and transfer of learning.

- How does division of fractions relate to multiplication of fractions?
- How is division of fractions used in the real world?
- Why is the quotient greater than the divided

Unit Enduring Understandings:

Students will understand that...

- Rational numbers are a natural extension of the way that we use numbers.
- Rational numbers are a set of numbers that includes whole numbers and integers as well as numbers that can be written as the quotient of two integers, a divided by b , where b is not zero.
- Rational numbers allow us to solve problems that are not possible to solve with just whole numbers or integers.

<p>when dividing by a value less than one?</p> <ul style="list-style-type: none"> • How does repeated subtraction or equal groups relate the measurement concept? • How much is one as it relates to the partition concept? • What is the difference between factors and multiples? • What is a ratio? • A rate is a ratio that shows what? 	<ul style="list-style-type: none"> • Rational numbers have multiple interpretations, and making sense of them depends on identifying the unit. • The concept of unit is fundamental to the interpretation of rational numbers. • One interpretation of a rational number is as a part-whole relationship. • One interpretation of a rational number is as a measure. • One interpretation of a rational number is as a quotient. • One interpretation of a rational number is as a ratio. • One interpretation of a rational number is as an operator. • Whole number conceptions of unit become more complex when extended to rational numbers. • Any rational number can be expressed as a fraction in an infinite number of ways. • Between any two rational numbers there are infinitely many rational numbers. • A rational number can be expressed as a decimal. • The interpretation of the operations on rational numbers are essentially the same as those on students develop fluidity in using multiple forms of ratio language and ratio notation. • They construct viable arguments and communicate reasoning about ratio equivalence They solve ratio problems in real-world contexts students develop a precise definition of the value of a ratio, whereas the value, applying previous understanding of fraction as division 						
<p>Knowledge: <i>Students will know how to/that....</i></p> <ul style="list-style-type: none"> • The system of rational numbers includes negative numbers. • The procedures for dividing fractions. • Number and ordering of numbers include negative rational numbers, and in particular negative integers. • A ratio is comparison of two or numbers • A rate is a ratio that compares quantities of two different units 	<p>Skills: <i>Students will be able to show or display...</i></p> <ul style="list-style-type: none"> • Interpreting and computing quotients of fractions. • Solve word problems involving multiplying and dividing fractions. • Finding the greatest common factor or two whole numbers. • Possess Fluidity in musing multiple forms of ratio language and ratio notations. • Discuss and model simple problems of finding one or more equivalent ratios 						
<p>Pacing Guide:</p> <table border="1"> <tr> <td>PreTesting</td><td>1 – 2 Days</td></tr> <tr> <td>Interpreting Division of a Fraction by a Whole Number, Interpreting Division of a Whole Number by a Fraction, Creating Division Stories, Relationship Between Visual Fraction Models and Equations, Dividing Fractions and Mixed Numbers</td><td>2 Weeks</td></tr> <tr> <td>Sums and Differences of Decimals, Distributive Property and the Products of</td><td>2 Weeks</td></tr> </table>		PreTesting	1 – 2 Days	Interpreting Division of a Fraction by a Whole Number, Interpreting Division of a Whole Number by a Fraction, Creating Division Stories, Relationship Between Visual Fraction Models and Equations, Dividing Fractions and Mixed Numbers	2 Weeks	Sums and Differences of Decimals, Distributive Property and the Products of	2 Weeks
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Sums and Differences of Decimals, Distributive Property and the Products of	2 Weeks						

Decimals, Fraction Multiplication and the Products of Decimals	
Estimating Digits in a Quotient, Dividing Multi-Digit Using the Algorithm, The Division Algorithm – Converting Decimal Division into Whole Numbers Division Using Fractions and Mental Math	2 Weeks
Even and Odd Numbers, Least Common Multiple and Greatest Common Factor, fluidity in using multiple forms of ratio language and ratio notation, ratio tables and study their additive and multiplicative structure	2 Weeks
Benchmark Testing & Reteaching	1 Week

Week 1: MAPs / Pre-Assessment

Week 2: GoMath Chapter 1

Week 3: GoMath Chapter 1

Week 4: GoMath Chapter 1 & 2

Week 5: GoMath Chapter 2

Week 6: GoMath Chapter 2

Week 7: GoMath Chapter 4

Week 8: GoMath Chapter 4 and Benchmark

Cape May City Elementary School District Grade 6 Mathematics Curriculum Unit II Overview

Content Area: Mathematics

Unit Title: Quarter II

Target Course/Grade Level: 6

Students will be able to:

- Write expression and equations that correspond to give situations.
- Evaluate expressions and use expressions and formulas to solve problems.

Interdisciplinary Connections:

- Science, Technology, Social Studies, Health, Social Emotional Learning, English Language/ Arts

21st Century Themes, Skills, and Standards:

- <http://www.state.nj.us/education/cccs/2014/career/>
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.
- Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
- Developing effective communication
- Developing Independent Learning Strategies
- Incorporating Science, Technology, Engineering, and English themes into daily lessons

Learning Targets

Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.A.1 Write and evaluate numeric expressions involving whole-number exponents.

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

- Write expressions that record operations with numbers and with letters standing for numbers.
- Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
- Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

6.EE.A.3 Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.

6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.

Reason about and solve one-variable equations and inequalities

6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

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

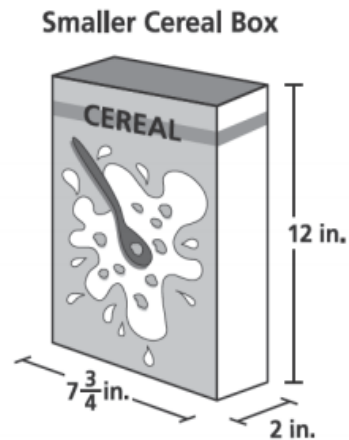
6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

CPI #

Cumulative Progress Indicators (CPI) for Unit

A company sells cereal in two different-sized boxes. The smaller box has the dimensions shown below.



- Find the volume of the box
- The height of the smaller box is 80% of the height of the larger box, while the other two dimensions are the same for both boxes. Create an equation for solving the larger box's volume
- Find the volume of the larger box.
- What is the differences in the volumes of the two boxes?

Rubric:

4 points – All subcomponent questions are answered correctly

3 Points – 3 of 4 subcomponent questions are answered correctly

2 Points – 2 of 4 subcomponent questions are answered correctly

1 Point – 1 of 4 subcomponent questions are answered correctly

0 Points – 0 of 4 subcomponent questions are answered correctly

Unit Enduring Questions:

Questions that will foster inquiry, understanding and transfer of learning.

- How can expressions with exponents be simplified? Why does this strategy work?
- What does it mean for expressions with variables to be equivalent?
- How can you determine if two or more expressions are equivalent? How can you generate equivalent expressions?
- What does it mean to find the solution to an equation?

Unit Enduring Understandings:

Students will understand that...

- Expressions are powerful tools for exploring, reasoning about, and representing situations.
- Two or more expressions may be equivalent, even when their symbolic forms differ. A relatively small number of symbolic transformations can be applied to expressions to yield equivalent expressions.
- Variables have many different meanings, depending on context and purpose.
- Using variables permits writing expressions whose values are not known or vary under different

<ul style="list-style-type: none"> • How can you represent solutions to inequalities? • How can you determine if a variable is independent or dependent? • How can an equation be used to represent a situation or data table? • What types of units are necessary for finding the area of two dimensional figures and surface area and volume of three-dimensional figures? Why are these units appropriate? • What is the relationship between rectangles and triangles having the same base and height measure? • How are the areas of parallelograms and trapezoids related to the area of rectangles? • How is the formula for the area of rectangles used in finding the volume of rectangular prisms? 	<p>circumstances.</p> <ul style="list-style-type: none"> • Using variables permits representing varying quantities. This use of variables is particularly important in studying relationships between varying quantities. • The equals sign can indicate that two expressions are equivalent. It is often important to find the value(s) of a variable for which two expressions represent the same quantity. • Finding the value(s) of a variable for which two expressions represent the same quantity is known as solving an equation. • An inequality is another way to describe a relationship between expressions; instead of showing that the values of two expressions are equal, inequalities indicate that the value of one expression is greater than (or greater than or equal to) the value of the other expression. • In solving an inequality, multiplying or dividing both expressions by a negative number reverses the sign that indicates the relationships between the two expressions. • The equals sign can be used in defining or giving a name to an expression or function rule. • Functions provide a tool for describing how variables change together. • Using a function in this way is called modeling, and the function is called a model. • Functions can be represented in multiple ways—in algebraic symbols, graphs, verbal descriptions, tables, and so on—and these representations, and the links among them, are useful in analyzing patterns of change. • One important way of describing functions is by identifying the rate at which the variables change together. It is useful to group functions into families with similar patterns of change because these functions, and the situations that they model, share certain general characteristics. • Some representations of a function may be more useful than others, depending on how they are used.
<p>Knowledge: <i>Students will know how to/that...</i></p> <ul style="list-style-type: none"> • The purpose and use of variables in mathematical expressions. • That expressions in different forms can be equivalent. • The relationship between shapes and determining area, surface area, and volume. The methods to find volume and area of various shapes. 	<p>Skills: <i>Students will be able to show or display...</i></p> <ul style="list-style-type: none"> • Writing expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. • Using the properties of operations to rewrite expressions in equivalent forms. Finding areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. • Discussing, developing, and justifying formulas for areas of triangles and parallelograms.
<p>Pacing Guide:</p>	

The Relationships of: Addition and Subtraction, Multiplication and Division, Multiplication and Addition, and Division and Subtraction	1 Week
Exponents, The Order of Operations	1 Week
Replacing Letters with Numbers, Replacing Numbers with Letters	½ Week
Writing Addition and Subtraction Expressions, Writing and Expanding Multiplication Expressions, Factoring Expressions, Distributing Expressions, Writing Division Expressions	1 Week
Read and Write Expressions in Which Letters Stand for Numbers	1 Week
Writing and Evaluating Expressions: Addition and Subtraction, Multiplication and Division, Multiplication and Addition, Exponents	1 Week
Volume with Fractional Edge Lengths and Unit Cubes, From Unit Cubes to the Formulas for Volume, The Formulas for Volume, Volume in the Real World	1 Week
Benchmark Testing and Re teaching	1 Week

Week 9: GoMath Chapter 7

Week 10: GoMath Chapter 7

Week 11: GoMath Chapter 8

Week 12: GoMath Chapter 8

Week 13: GoMath Chapter 8 & 9

Week 14: GoMath Chapter 9

Week 15: GoMath Chapter 9

Week 16: Performance Benchmark and review.

**Cape May City Elementary School District Grade 6 Mathematics Curriculum
Unit III Overview**

Content Area: Mathematics

Unit Title: Quarter III

Target Course/Grade Level: 6

Unit Summary:

Students will be able to:

- Reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.
- Use this understanding to solve real-world problems.
- Find areas of triangles and parallelograms.
- Use their knowledge of geometry to create scale drawings and constructions in the coordinate plane.

Interdisciplinary Connections:

- Science, Technology, Social Studies, Health, Social Emotional Learning, Mathematics

21st Century Themes, Skills, and Standards:

- <http://www.state.nj.us/education/cccs/2014/career/>
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.
- Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
- Developing effective communication
- Developing Independent Learning Strategies
- Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets

Apply and extend previous understandings of numbers to the system of rational numbers.

6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

- Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3)=3$, and that 0 is its own opposite.
- Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
- Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.C.7 Understand ordering and absolute value of rational numbers.

- Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
- Write, interpret, and explain statements of order for rational numbers in real-world contexts.
- Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
- Distinguish comparisons of absolute value from statements about order.

6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate

Reason about and solve one-variable equations and inequalities.

6.EE.B.5 Understand solving an equation or inequality as a process of answering a question; which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations in the form $x+p=q$ and $px=q$ for cases in which p , q and x are all nonnegative rational numbers.

6.EE.B.8 Write an inequality of the form $x>c$ or $x<c$ to represent a constraint or condition in a real-world mathematical problem. Recognize that inequalities of the form $x>c$ or $x<c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Represent and analyze quantitative relationships between dependent and independent variables.

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

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

6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

CPI #	Cumulative Progress Indicators (CPI) for Unit
4	<p>The table below shows a partial price list for boxes of cookies. Each box of cookies costs the same amount of money.</p> <p>Part A:</p> <p>Complete the table for the missing prices.</p>

Number of Boxes of Cookies	Price (dollars)
1	
2	\$5.00
3	\$7.50
4	
5	\$12.50
6	
7	

Part B:

Write an equation to represent the relationship between the price and the number of boxes of cookies. Be sure to define your variables.

Rubric:

5 points – All subcomponent questions are answered correctly

4 Points – 4 of 5 subcomponent questions are answered correctly

3 Points – 3 of 5 subcomponent questions are answered correctly

2 Point – 2 of 5 subcomponent questions are answered correctly

1 Point – 1 of 5 subcomponent questions are answered correctly

0 Points – 0 of 5 subcomponent questions are answered correctly

Unit Enduring Questions:

Questions that will foster inquiry, understanding and transfer of learning.

- What is the meaning of positive and negative numbers and zero in real-life situations?
- How and why are rational numbers ordered? How and why is absolute value ordered?
- What is the definition of coordinate plane terminology and where are the quadrants located?
- What is the conceptual understanding of absolute value and in terms of a real-world context?
- What types of units are necessary for finding the area of two dimensional figures and surface area and volume of three-dimensional figures? Why are these units appropriate?
- What is the relationship between rectangles and triangles having the same base and height measure?
- How are the areas of parallelograms and trapezoids related to the area of rectangles?
- How is the formula for the area of rectangles used in finding the volume of rectangular prisms?
- What is the distance between points (x_1, y_1) and (x_1, y_2) and (x_1, y_1) and (x_2, y_1) ?

Unit Enduring Understandings:

Students will understand that...

- Rational numbers are a natural extension of the way that we use numbers.
- Rational numbers are a set of numbers that includes whole numbers and integers as well as numbers that can be written as the quotient of two integers, a divided by b , where b is not zero.
- Rational numbers allow us to solve problems that are not possible to solve with just whole numbers or integers.
- Rational numbers have multiple interpretations, and making sense of them depends on identifying the unit.
- The concept of unit is fundamental to the interpretation of rational numbers.
- One interpretation of a rational number is as a part-whole relationship.
- One interpretation of a rational number is as a measure.
- One interpretation of a rational number is as a quotient.
- One interpretation of a rational number is as a ratio.
- One interpretation of a rational number is as an operator.
- Whole number conceptions of unit become more complex when extended to rational numbers.
- Any rational number can be expressed as a in an infinite number of ways. fraction
- Between any two rational numbers there are infinitely many rational numbers.
- A rational number can be expressed as a decimal.
- The interpretation of the operations on rational numbers are essentially the same as those on whole numbers, but some interpretations require adaptation, and the algorithms are different.
- Estimation and mental math are more complex with rational numbers than with whole numbers.
- Decomposing and rearranging provide a geometric way of both seeing that a measurement formula is the right one and seeing why it is the right one.
- In addition to decomposing and rearranging, shearing provides another geometric way of both

Knowledge:

Students will know how to/that...

- The system of rational numbers includes negative numbers.
- Number and ordering of numbers include negative rational numbers, and in particular negative integers.
- Order and absolute value of rational numbers are used to locate points on the coordinate plane.
- The solutions of an equation are the values of the variables that make the equation true.

Skills:

Students will be able to show or display...

- Recognizing opposite signs of numbers
- Write, interpret, and explain statements of • order rational numbers
- Distinguishing comparisons of absolute value from statements about order
- Using the absolute value of rational numbers to plot points on the coordinate plane.
- Constructing and analyzing tables, such as tables of quantities that are in equivalent ratios, and using equations to describe relationships between quantities.

- Drawing polygons in the coordinate plane

Pacing Guide:

Positive and Negative Numbers on the Number Line, Real-World Positive and Negative Numbers and Zero, The Opposite of a Number, Rational Numbers on the Number Line	1 & 1/2 Weeks
Ordering Integers and Other Rational Numbers, Comparing Integers and Other Rational Numbers, Absolute Value – Magnitude and Distance, The Relationship Between Absolute Value and Order, Statements of Order in the Real World	1 Week
Ordered Pairs, Locating Ordered Pairs on the Coordinate Plane, Symmetry in the Coordinate Plane, Drawing the Coordinate Plane and Points on the Plane, Distance on the Coordinate Plane, Problem-Solving and the Coordinate Plane	2 Weeks
Writing and Evaluating Expressions: Addition and Subtraction, Multiplication and Division, Multiplication and Addition, Exponents	2 Weeks
One-Step Equations: Addition and Subtraction, Multiplication and Division, Two-Step Problems (All Operations), Multi-Step Problems (All Operations), Multi-step Problems in the Real World, From Equations to Inequalities, Writing and Graphing Inequalities in Real-World Problems	2 Weeks
End-of-Module Assessment	3 Days

Week 17: GoMath Chapter 7

Week 18: GoMath Chapter 7

Week 19: GoMath Chapter 8

Week 20: GoMath Chapter 8

Week 21: GoMath Chapter 8 & 9

Week 22: GoMath Chapter 9

Week 23: GoMath Chapter 9

Week 24: Performance Benchmark and review.

Cape May City Elementary School District Mathematics Grade 6 Curriculum Unit IV Overview

Content Area: Mathematics

Unit Title: Quarter IV

Target Course/Grade Level: 6

Unit Summary:

Students will be able to:

- Represent and analyze data distributions.
- View statistical reasoning as a four-step investigative process: Formulate questions that can be answered with data, design and use a plan to collect relevant data, analyze the data with appropriate methods and interpret results, and draw valid conclusions from the data that relate to the questions posed.

Interdisciplinary Connections:

- Science, Technology, Social Studies, Health, Social Emotional Learning, Mathematics

21st Century Themes, Skills, and Standards:

- <http://www.state.nj.us/education/cccs/2014/career/>
- 21st Century Life and Career Standard 9.1, including critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding and interpersonal communication and science.
- Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
- Developing effective communication
- Developing Independent Learning Strategies
- Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets

Develop understanding of statistical variability.

6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.

6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Summarize and describe distributions.

6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.B.5 Summarize numerical data sets in relation to their context, such as by:

- a. Reporting the number of observations.
- b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

CPI #	Cumulative Progress Indicators (CPI) for Unit
4	<p>1. The mean weight of nine players on a baseball team is 177 pounds.</p> <p>Find the total weight of the nine players. _____</p> <p>Show your work.</p> <div data-bbox="1328 512 1498 751" data-label="Image"> </div> <p>2. The mean weight of the nine players and three reserve players is 188 pounds.</p> <p>Find the mean weight of the three reserve players. _____</p> <p>Show how you figured it out.</p> <p>3. The opposing baseball team has nine players whose weights, in pounds, are 174, 177, 194, 162, 196, 169, 187, 192, 178.</p> <p>Find the median and the range of these weights.</p> <p>median _____ range _____</p> <p>Rubric:</p> <p>6 points – All subcomponent questions are answered correctly</p> <p>5 Points – 5 of 6 subcomponent questions are answered correctly</p>

	<p>4 Points – 4 of 6 subcomponent questions are answered correctly</p> <p>3 Points – 3 of 6 subcomponent questions are answered correctly</p> <p>2 Point – 2 of 6 subcomponent questions are answered correctly</p> <p>1 Point – 1 of 6 subcomponent questions are answered correctly</p> <p>0 Points – 0 of 6 subcomponent questions are answered correctly</p>
<p>Unit Enduring Questions:</p> <p><i>Questions that will foster inquiry, understanding and transfer of learning.</i></p> <ul style="list-style-type: none"> • What types of questions will result in statistical variability? • What can a graph's shape reveal about the data? • What do the measures of center (mean and median) reveal about the data? • When is it more appropriate to use the median rather than the mean to describe data? • How can the inter-quartile range be useful? • How can outliers affect data? • What types of data are best displayed using a box plot, dot plot, or histogram? 	<p>Unit Enduring Understandings:</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Formulating questions, designing studies, and collecting data about a characteristic shared by two populations or different characteristics within one population. • Selecting, creating, and using appropriate graphical representations of data, including histograms, box plots, and scatter plots. • Finding, using, and interpreting measure of center and spread, including mean and inter-quartile range. • Discussing and understanding the correspondence between data sets and their graphical representations, especially histograms, and scatter plots. • Using observations about differences between two or more samples to make conjectures about the populations from which samples were taken. • Making conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit. • Using conjectures to formulate new questions and plan new studies to answer them. • Understanding and using appropriate terminology to describe complementary and mutually exclusive events. • Using proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations. • Computing probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.
<p>Knowledge:</p> <p><i>Students will know how to/that...</i></p> <ul style="list-style-type: none"> • Variability and precise descriptions of data distributions. • How to use histograms and box plots to represent and analyze data distributions. • That statistical reasoning can be viewed as a 	<p>Skills:</p> <p><i>Students will be able to show or display...</i></p> <ul style="list-style-type: none"> • Displaying and analyzing data distributions in various models and charts. • Finding, using, and interpreting measure of center and spread, including mean and interquartile range

four-step investigative process.

Pacing Guide:

Posing Statistical Questions, Displaying a Data Distribution, Creating a Dot Plot, Creating a Histogram, Describing a Distribution Displayed in a -Describing the Center of a Distribution Using the Mean, The Mean as a Balance Point, Variability in a Data Distribution, The Mean Absolute Deviation (MAD), Describing Distributions Using the Mean and MADHistogram,	2 Weeks
Describing the Center of a Distribution Using the Median, Describing Variability Using the Interquartile Range (IQR), Summarizing a Distribution Using a Box Plot, Understanding Box Plots	1 Week
Developing a Statistical Project, Graphical Representation, Summarizing a Data Distribution by Describing	2 Weeks
Connecting Graphical Representations and Numerical Summaries, Comparing Data Distributions, Describing Center, Variability, and Shape of a Data Distribution from a Center, Variability, and Shape, Presenting a Summary of a Statistical Project	2 Weeks
Incorporate Fluency Standards	Entire Unit Week
Benchmark Testing & Reteaching	2 Weeks

Week 25: GoMath Chapter 12

Week 26: GoMath Chapter 12

Week 27: GoMath Chapter 12

Week 28: GoMath Chapter 13

Week 29: GoMath Chapter 13

Week 30: GoMath Chapter 13

Week 31: GoMath EOY Concepts

Week 32: GoMath EOY Concepts Performance Benchmark and review.

**Cape May City Elementary School District Grade 6 Mathematics Curriculum
Evidence of Learning**

Specific Formative Assessments Utilized in Daily Lessons:

- Suggested Formative Assessment
- Daily independent practice
- Peer Discussions
- Student Portfolio
- Problem of the Day
- Self-Evaluations
- Teacher Quizzes
- Student created activities
- Exit Tickets

Summative Assessment Utilized throughout Units:

- QBA's
- Performance Task
- Technology Task
- MAPs Testing
- Chapter Tests from GoMath

Benchmarks:

- Quarterly Benchmarks from GoMath!
- MAPs Testing and Reports

Modifications for English Language Learner's [ELL]

- Teacher tutoring
- Peer tutoring
- Online Resources
- Cooperative Learning Groups
- Modified Assignments
- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Provide additional examples and opportunities for additional problems for repetition with visuals and manipulatives
- Assess/teach prerequisite skills
- Allow students to count in their native language.
- Write the number words and corresponding numerals. Have children draw objects to illustrate each word.
- Provide students with a variety of materials of various textures to increase tactile learning while counting.
 - Children should move objects in a set as they recite the counting sequence.
 - Allow students to act out word problems, moving around room as necessary.

- Utilize Envision Spanish Version/Interactive Path and Printable Resources
 - Read picture books to build vocabulary and background knowledge (samples below)
 - o <https://www.cantonpl.org/blog/post/picture-books-about-shapes>
 - o <http://childrenspicturebooks.info/math/fractions.htm>
 - o <http://www.the-best-childrens-books.org/teaching-graphs.html>
 - Teach a variety of strategies that students can use to problem solve (act it out, manipulatives, hundreds chart, draw a picture, etc.)
 - Read all directions and word problems. Translate if necessary.
 - Utilize Envision Spanish Version/Interactive Path and Printable Resources

Modifications for Special Education Students [IEPs]:

- Follow all IEP accommodations for each student as to meet each student's individual need
- Manipulatives
- Protractors
- For extra strategies please review list above in the ELL category for students who have IEPs
- Provide instructional breaks / practice chunking
- Circling back to original topic
- Provide graphic organizers
- Provide additional examples and opportunities for additional problems for repetition
- Provide tutoring opportunities
- Provide retesting opportunities after remediation (up to teacher and district discretion) Teach for mastery not test
- Teaching concepts in different modalities
- Adjust pace and homework assignments

Modifications for students with 504s:

- Adhere to the modifications of the 504
- For extra strategies please review list above in the ELL category and for students who have IEPs
- Provide instructional breaks / practice chunking
- Circling back to original topic

Modifications Gifted and Talented Students:

- Advance Questions from GoMath
- Teacher created assignments
- STEM Lab Activities
- http://www.npsd.k12.wi.us/cms_files/resources/GiftedandTalentedResourcesforEducators2013.pdf

Modifications At-Risk/Basic Skills:

- Teacher tutoring
- Supplemental / Pullout Teaching
- Peer tutoring
- Cooperative Learning Groups / Centers
- Modified Assignments

- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Provide additional examples and opportunities for additional problems for repetition with visuals and manipulatives
- Simplified language for understanding
- Modify Homework, Assignments and Assessment (can be oral if necessary)
- Total Physical Response
- Picture & number wall

Teacher Notes:

- As required by the NJ Department of Education, teachers in all content areas will integrate the 21st Century Life and Careers Standards. As the NJDOE indicates, “Providing New Jersey students with the life and career skills needed to function optimally within this dynamic context is a critical focus and organizing principle of K-12 public education. New Jersey has both an obligation to prepare its young people to thrive in this environment, and a vested economic interest in grooming an engaged citizenry made up of productive members of a global workforce that rewards innovation, creativity, and adaptation to change.” The links below indicate the CPIs for grade ranges and need to be addressed throughout the units of study:
Life and Career Standards
- As indicated in the NJSLS, standards and interdisciplinary connections will be integrated throughout content area curriculum. Links to relevant content standards can be at Scholastic.com, Starfall.com, and other online resources.

Project-based Learning Tasks:

- Ongoing student portfolio assessments [created by faculty] to monitor student progress.

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.
- Story, key details, retell, describe, main topic, rhyming words, syllables, story elements, character, setting, question, question words, front cover, back cover, title page, narrative, favorite, informational text, rules, connection, discuss, conversation, information, illustrator, author, illustrate, picture

The Research Process:

- The research process must be integrated within each course curriculum. Student will be provided with opportunities to investigate issues from thematic units of study. As the NJSLS indicate, students will develop proficiency with MLA or APA format as applicable.
- https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html
- https://owl.purdue.edu/owl/research_and_citation/mla_style/mla_formatting_and_style_guide/mla_formatting_and_style_guide.html

Technology:

- Students must engage in technology applications integrated throughout the curriculum, though technology provided by us in their individual classroom, and in our technology centered classrooms.
- MAPs
- Online Resources

Resources:

- Ancillary resources and materials used to deliver instruction are included below:
- Learning New Jersey Model Curriculum
- ThinkCentral
- Achieve3000
- Prodigy.com
- Reading A-Z.com
- Abcmouse .com
- EnchantedLearning.Com
- Sing Along Songs
- Scholastic.com
- Bilingualplanet.com
- Frog street
- Press.com
- 122 teachme.com
- Purplemath.com
- Starfall
- NCTM Illuminations - <http://illuminations.nctm.org>,
- Illustrative Math - <https://www.illustrativemathematics.org>

Career Education & Resources:

- NJDOE CTE (<https://www.nj.gov/education/cte/>)
- Careers are Everywhere Workbook (<https://lmci.state.tx.us/shared/careersareeverywhere.asp>)
- Career Bingo (http://www.breitlinks.com/careers/career_pdfs/careerbingo.pdf)
- Vocational Information Center / Career Exploration Guides and Resources for Younger Students (<http://www.khake.com/page64.html>)
- CTE NJDOE Career Explore (<https://www.nj.gov/education/cte/resources/tools/exploration.htm>)

Differentiation Strategies

Differentiation strategies can require varied amounts of preparation time. High-prep strategies often require a teacher to both create multiple pathways to process information/demonstrate learning and to assign students to those pathways. Hence, more ongoing monitoring and assessment is often required. In contrast, low-prep strategies might require a teacher to strategically create process and product choices for students, but students are allowed to choose which option to pursue given their learning profile or readiness level. Also, a low-prep strategy might be focused on a discrete skill (such as vocabulary words), so there are fewer details to consider. Most teachers find that integration of one to two new low-prep strategies and one high-prep strategy each quarter is a reasonable goal.

Low Prep Strategies	
Varied journal prompts, spelling or vocabulary lists	Students are given a choice of different journal prompts, spelling lists or vocabulary lists depending on level of proficiency/assessment results.
Anchor activities	Anchor activities provide meaningful options for students when they are not actively engaged in classroom activities (e.g., when they finish early, are waiting for further directions, are stumped, first enter class, or when the teacher is working with other students). Anchors should be directly related to the current learning goals.
Choices of review activities	Different review or extension activities are made available to students during a specific section of the class (such as at the beginning or end of the period).
Homework options	Students are provided with choices about the assignments they complete as homework. Or, students are directed to specific homework based on student needs.
Student-teacher goal setting	The teacher and student work together to develop individual learning goals for the student.
Flexible grouping	Students might be instructed as a whole group, in small groups of various permutations (homogeneous or heterogeneous by skill or interest), in pairs or individual. Any small groups or pairs change over time based on assessment data.
Varied computer programs	The computer is used as an additional center in the classroom, and students are directed to specific websites or software that allows them to work on skills at their level.
Multiple Intelligence or Learning Style options	Students select activities or are assigned an activity that is designed for learning a specific area of content through their strong intelligence (verbal-linguistic, interpersonal, musical, etc.)
Varying scaffolding of same organizer	Provide graphic organizers that require students to complete various amounts of information. Some will be more filled out (by the teacher) than others.
Think-Pair-Share by readiness, interest, and/or learning profile	Students are placed in predetermined pairs, asked to think about a question for a specific amount of time, then are asked to share their answers first with their partner and then with the whole group.

Mini workshops to re-teach or extend skills	A short, specific lesson with a student or group of students that focuses on one area of interest or reinforcement of a specific skill.
Orbitals	Students conduct independent investigations generally lasting 3-6 weeks. The investigations “orbit” or revolve around some facet of the curriculum.
Games to practice mastery of information and skill	Use games as a way to review and reinforce concepts. Include questions and tasks that are on a variety of cognitive levels.
Multiple levels of questions	Teachers vary the sorts of questions posed to different students based on their ability to handle them. Varying questions is an excellent way to build the confidence (and motivation) of students who are reluctant to contribute to class discourse. Note: Most teachers would probably admit that without even thinking about it they tend to address particular types of questions to particular students. In some cases, such tendencies may need to be corrected. (For example, a teacher may be unknowingly addressing all of the more challenging questions to one student, thereby inhibiting other students’ learning and fostering class resentment of that student.)
High Prep Strategies	
Cubing	Designed to help students think about a topic or idea from many different angles or perspectives. The tasks are placed on the six sides of a cube and use commands that help support thinking (justify, describe, evaluate, connect, etc.). The students complete the task on the side that ends face up, either independently or in homogenous groups.
Tiered assignment/ product	The content and objective are the same, but the process and/or the products that students must create to demonstrate mastery are varied according to the students’ readiness level.
Independent studies	Students choose a topic of interest that they are curious about and wants to discover new information on. Research is done from questions developed by the student and/or teacher. The researcher produces a product to share learning with classmates.
4MAT	Teachers plan instruction for each of four learning preferences over the course of several days on a given topic. Some lessons focus on mastery, some on understanding, some on personal involvement, and some on synthesis. Each learner has a chance to approach the topic through preferred modes and to strengthen weaker areas

Jigsaw	Students are grouped based on their reading proficiency and each group is given an appropriate text on a specific aspect of a topic (the economic, political and social impact of the Civil War, for example). Students later get into heterogeneous groups to share their findings with their peers, who have read about different areas of study from source texts on their own reading levels. The jigsaw technique allows you to tackle the same subject with all of your students while discreetly providing them the different tools they need to get there.
Alternative assessments	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. This differentiation creates possibilities for students who excel in different modalities over others (verbal versus visual).
Modified Assessments	Assessments can be modified in a variety of ways – for example by formatting the document differently (e.g. more space between questions) or by using different types of questions (matching vs. open ended) or by asking only the truly essential questions.
Learning contracts or Personal Agendas	A contract is a negotiated agreement between teacher and student that may have a mix of requirements and choice based on skills and understandings considered important by the teacher. A personal agenda could be quite similar, as it would list the tasks the teacher wants each student to accomplish in a given day/lesson/unit. Both Learning contracts and personal agendas will likely vary between students within a classroom.
Compacting	This strategy begins with a student assessment to determine level of knowledge or skill already attained (i.e. pretest). Students who demonstrate proficiency before the unit even begins are given the opportunity to work at a higher level (either independently or in a group).
Literature circles	Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.
Learning Centers	A station (or simply a collection of materials) that students might use independently to explore topics or practice skills. Centers allow individual or groups of students to work at their own pace. Students are constantly reassessed to determine which centers are appropriate for students at a particular time, and to plan activities at those centers to build the most pressing skills.
Tic-Tac-Toe Choice Board (sometimes called	The tic-tac-toe choice board is a strategy that enables students to choose multiple tasks to practice a skill, or demonstrate and extend

<p>“Think-Tac-Toe”</p>	<p>understanding of a process or concept. From the board, students choose (or teacher assigns) three adjacent or diagonal. To design a tic-tac-toe board: - Identify the outcomes and instructional focus - Design 9 different tasks - Use assessment data to determine student levels - Arrange the tasks on a tic-tac-toe board either randomly, in rows according to level of difficulty, or you may want to select one critical task to place in the center of the board for all students to complete.</p>
<p>Curriculum Development Resources/Instructional Materials:</p>	
<p>List or Link Ancillary Resources and Curriculum Materials Here:</p> <ul style="list-style-type: none"> • New Jersey Student Learning Standards (https://www.nj.gov/education/cccs/) • NJSLS Mathematics (https://www.nj.gov/education/aps/cccs/math/) 	
<p>Board of Education Approved Text(s)</p>	
<p>GoMath Grade 6 (Text and Workbook)</p>	