

Madison Public Schools

Math 6/Accelerated Math 6 Curriculum

Written by:

Stefania Lambusta and Andrea Olsen
Summer 2017

Revised by:

Stefania Lambusta and Danielle Dalessio
Summer 2018

Reviewed by:

Daniel J. Ross, Esq.
Director of Curriculum and Instruction

Kelly Bosworth
Supervisor of Mathematics and Science

Approval date(s):

Original: November 7, 2017
Revision: September 25, 2018

Members of the Board of Education:

Leslie Lajewski, President
Lisa Ellis, Vice President
Johanna Habib
David Irwin
Thomas Piskula
Heather Reddy
Abi Singh
Pam Yousey

Madison Public Schools
359 Woodland Road
Madison, NJ 07940
www.madisonpublicschools.org

Course Overview

Description
Math 6 extends concepts introduced in Math 5 while at the same time preparing students to be critical thinkers and problem solvers. Students will utilize previously mastered concepts and skills and will extend them to solve challenging and real world problems. Each unit provides an opportunity for students to master new skills and encourages them to develop and utilize appropriate mathematical terminology to explain their reasoning. Major topics include ratios and proportional relationships, the number system, expressions and equations, geometry and statistics. The course aligns with the New Jersey Student Learning Standards and the Standards for Mathematical Practice.
Goals
<p>This course aims to:</p> <ul style="list-style-type: none">• enable students to make sense of various types of problems and the reasonableness of their answers• build student confidence with the various approaches to solving a problem and persevere in solving them• encourage students to become abstract thinkers who make sense of quantities and their relationships in problem situations• develop students' ability to cooperatively discuss, make conjectures, and critique ideas of one another• use, apply, and model mathematics to solve problems arising in everyday life, society, and the workplace• consider the variety of available tools when solving a mathematical problem• communicate mathematical ideas precisely and effectively to others• determine a pattern or analyze structure within mathematical content to apply to related ideas• use repeated reasoning to follow a multi-step process through to completion
Materials
Core: Big Ideas Green Book, Supplemental: Edulastic, illustrative Math, Khan Academy
Resources
Suggested activities and resources page
Benchmarks
Students will take the STAR Mathematics assessment a minimum 3 times during the school year.
Modifications and Adaptations for Special Needs Learners

(Gifted and Talented Students, English Language Learners, Special Education Students, At-Risk Students)

Scope and Sequence (Pacing Guide)

Unit Number	Topic of Study	Duration (Weeks Taught)
1	Number Sense & Factors	2 weeks
2	Fractions and Decimals	5 weeks
3	Algebraic Expressions	3 weeks
4	Ratios & Percentages	5 weeks
5	Rational Numbers & Coordinate Planes	2 weeks
6	Equations and Inequalities	4 weeks
7	Geometry	5 weeks
8	Statistics	4 weeks
9	Integer Operations	2 weeks

Unit 1 Number Sense and Factors

Unit Title: Number Sense and Factors

Unit Summary:

This unit reviews whole number operations and extends 5th grade math concepts by introducing and reinforcing the standard algorithm for division (expressing remainders as fractions and decimals), exponents, order of operations, prime factorization, greatest common factor, and least common multiple. Students will use these skills to solve real world problems.

Suggested Pacing: 10 lessons, 2 Review, 1 Quiz, 1 Test = 14 days

Learning Targets

Unit Essential Questions:

- How do you know which operations to choose when solving real-life problems?
- How can you use order of operations to ensure common results?

- How can you use repeated factors in real-life situations?
- Why would one need to find common factors and multiples?
- How can you use greatest common factors and least common multiples when solving real-life problems?

Unit Enduring Understandings:

- The proper operations and procedures must be determined in order to solve problems.
- Factors of a (whole) number are always less than or equal to the number itself.
- Multiples of a (whole) number are always greater than or equal to the number itself.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 1 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Determine which operation to perform from a word problem Divide multi-digit numbers	Content: Whole Number Operations Skills: Adding, Subtracting, Multiplying, Dividing Whole Numbers Express remainders as fractions and decimals	Partner Activity: Students will create their own word problem involving long division with fraction and decimal remainders.	6.NS.B2 - Fluently divide multi-digit numbers using the standard algorithm. CRP6. Demonstrate creativity and innovation.	3 lessons
Write expressions as powers Find values of powers Evaluate numerical expressions with whole number exponents Perform whole number operations utilizing the correct order of operations	Content: Power Base Exponent Sum Term Product Factor Coefficient Order of Operations Skills: Fluently divide Write expressions as powers Find values of powers Utilize parenthesis Utilize the order of operations	Small Group Activity: Students will work in groups to complete an order of operation line-up. Small Group Activity: Complete order of operations problems and cover answers with pentomino shapes to reveal animal answer. Small Group Activity: Students will be given incorrect order of operations problems to correct. Students will work together and discuss some common errors they find to share with the class. Students will then correct each expression.	6.EE.A1 - Write and evaluate numerical expressions involving whole-number exponents. 6.EE.2b- Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms. 6.EE.A.2c. 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). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find	3 lessons

			<p>the volume and surface area of a cube with sides of length $s = 1/2$.</p> <p>CRP4. Communicate clearly and effectively and with reason.</p> <p>NJSLSA.L6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.</p>	
<p>Use divisibility rules to find prime factorizations of numbers.</p> <p>Find the greatest common factor of two whole numbers less than or equal to 100</p> <p>Find the least common multiple of two whole numbers less than or equal to 12.</p> <p>Determine GCF or LCM from real world word problems.</p>	<p>Content: prime and composite numbers Factors Multiples</p> <p>Skills: Finding prime factorization of a number Finding GCF Finding LCM Identifying key words for LCM and GCF in word problems</p>	<p>Partner Activity:</p> <p>Students will work in partners to complete stations involving GCF and LCM.</p>	<p>6.NS.B4 - 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. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i></p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p>	4 lessons

Unit 2 Fractions and Decimals

Unit Title: Fractions and Decimals

Unit Summary:

This unit reinforces number sense, addition, subtraction, and multiplication of fractions and decimals. Students extend their learning to division with rational numbers. Students use models to discover patterns and derive algorithms, while extending their understanding of the use of rational numbers in real world contexts.

Suggested Pacing: 20 lessons, 3 Review, 2 Quizzes, 1 Test = 26 days

Learning Targets

Unit Essential Questions:

- What does it mean to multiply fractions?
- What is represented by division of a fraction by a fraction?
- What type of visual models can be used to represent division of fractions?
- How are division and multiplication of a fraction by a fraction related?
- What does it mean to multiply decimals?
- What type(s) of problems require using multi-digit decimal operations?

Unit Enduring Understandings:

- The size of a factor impacts the size of the answer with respect to the other factor.
- Division by a rational number may result in a quotient whose value is bigger than, equal to, or smaller than the value of the dividend.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 2 assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Compare and order fractions	Content: Equivalent Fractions Common Denominators Improper Fractions Mixed Numbers Skills: Creating Equivalent Fractions Using LCM to find a common denominator Converting improper fractions and mixed numbers Comparing and Ordering fractions	Partner Activity: Students use fraction tiles to compare and create equivalent fractions	5NF 1-7 (Review)	2 lessons
Fraction operations using models and algorithms	Content: Reciprocals Divisor Dividend Quotient Skills: Add and Subtract fractions with unlike denominators Use models to multiply fractions Multiply fractions by fractions or mixed numbers Use models to divide fractions Divide fractions by fractions Use models to divide mixed numbers Divide mixed numbers Interpret quotients of fractions Create a real world story for division with fractions.	Group Activity: Farmland problem solving - Students discover fractional portions by creating equal sections of the farmland using addition and subtraction of fractions. Small Group Activity: Students use brownie pans, pizzas, and ribbon badges to model multiplication and division with fractions. Students search for patterns to derive algorithms.	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. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP2. Apply appropriate academic and technical skills.	10 lessons

Compare, order and round decimals	<p>Content: Place value</p> <p>Skills: Comparing decimals based on place value Rounding to a given place value Ordering decimals from least to greatest</p>	<p>Partner activity: Say and write decimal numbers</p> <p>Partner Activity: Decimal War</p> <p>Group Activity: Students round decimals to a given place value and place the answers in order from least to greatest.</p>	5.NBT.A4 -Use place value understanding to round decimals to any place. (Review)	2 lessons
Perform decimal operations utilizing standard algorithms	<p>Content: Place Value</p> <p>Skills: Fluently add multi-digit decimals using the standard algorithm Fluently subtract multi-digit decimals using the standard algorithm Use models to multiply decimals Fluently multiply multi-digit decimals using the standard algorithm Use models to divide decimals Fluently divide multi-digit decimals using the standard algorithm</p>	<p>Partner Activity: Students use a hundreds grid to model multiplication and division of decimals, recognize patterns, and derive the algorithm.</p> <p>Partner Activity: Students use the algorithm for multiplying and dividing decimals to complete word problem stations.</p>	<p>6.NS.B.3 - Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p> <p>CRP2. Apply appropriate academic and technical skills.</p>	6 lessons

Unit 3 Algebraic Expressions

Unit Title: Algebraic Expressions

Unit Summary:

Students will learn to represent a real-world unknown value with a variable and create expressions to model real-world situations. Students will apply the distributive, commutative, and associative properties to show that expressions are equivalent. Students will develop flexible thinking skills in identifying parts of an expression and creating equivalent expressions.

Suggested Pacing: 12 lessons, 2 Review, 1 Quiz, 1 Test = 16 days

Learning Targets

Unit Essential Questions:

- How are mathematical expressions in which letters stand for numbers useful in real life?
- How can you write and evaluate an expression that represents a real-life problem?
- What is the difference between an algebraic expression and an arithmetic expression?
- How can you apply the associative property to combine like terms?
- In what situation would one want to use the distributive property to add two whole numbers?
- What is the purpose of identifying equivalent expressions?

Unit Enduring Understandings:

- Algebraic expressions have letters that stand for numbers and arithmetic expressions have only numbers and no letters.

- Numbers can be substituted in place of letters in algebraic expressions.
- Algebraic expressions can be equivalent to each other.
- Verbal sentences or expressions can be written as algebraic expressions.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 3 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Alternative Assessment: Sports and Mathematics Project (Big Ideas Math (green book), chapter 3 resources)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Use order of operations to evaluate algebraic expressions with variables	Content: Variable Substitution Algebraic Expression Simplify Skills: Substitute values for variables and evaluate to produce a value	Group Activity: Evaluating Algebraic Expressions Line-Up - Students evaluate expressions given a value for the variable and order the answers.	6.EE.A1 Write and evaluate numerical expressions involving whole-number exponents 6.EE.A.2c-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). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.	2 lessons
Write algebraic expressions with variables	Content: Equivalent Variable Expression Terms Coefficient Constant Let statements Skills: Use variables to represent numbers in algebraic expressions Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient) View one or more parts of an expression multiplied together as a single term.	Small group activity: Matching algebraic expressions with verbal translations puzzle.	6.EE.A2. Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.2b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. <i>For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.</i> NJSLA.L6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an	4 lessons

	Write expressions to represent real-world situations.		unknown term important to comprehension or expression.	
Combine like terms to simplify expressions	Content: Like Terms Coefficient Skills: Combine like terms using addition and subtraction of coefficients	Partner Activity: Students use colored highlighters or colored pencils to mark like terms and combine into a simplified expression	6.EE.A3 Apply the properties of operations to generate equivalent expressions.	2 lessons
Apply the distributive property to create equivalent expressions	Content: Order of Operations Equivalent expressions GCF Skills: Model the distributive property using algebra tiles Using the distributive property with whole numbers and variables	Class activity: Use algebra tiles and virtual manipulatives to model expressions and multiplication with the distributive property. Partner activity: Square puzzle matching equivalent expressions to represent the distributive property.	6.NS.B4 - 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. CRP11. Use technology to enhance productivity.	2 lessons
Generate and recognize equivalent expressions	Content: Equivalent expressions Skills: Performing operations to create equivalent expressions Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).	Small group activity: Generate equivalent expressions equivalent to given term, $25x$. Whole Class Game: Students work in teams to determine which expressions displayed on the SMARTboard are equivalent to the original expression. They record their answers on a clear communicator.	6.EE.A3 Apply the properties of operations to generate equivalent expressions. 6.EE.A4 Identify when two expressions are equivalent CRP4. Communicate clearly and effectively and with reason.	2 lessons

Unit 4 Ratios and Percents

Unit Title: Ratios and Percents

Unit Summary:

In this unit, students will develop an understanding of ratio concepts and use ratio reasoning to solve problems. This unit provides an understanding of ratios and various ways to represent their relationships. Tape diagrams, double number lines, and ratio tables will be explored as ways to see these relationships. Students use reasoning about multiplication and division to solve real world ratio and rate problems about quantities. The unit also investigates percent as a ratio and applications of percent problem solving.

Suggested Pacing: 20 lessons, 2 Review, 1 Quiz, 1 Test = 24 days

Learning Targets

Unit Essential Questions:

- Why does one need to compare numbers?

- When does one need to use ratios to compare numbers?
- How can one compare and contrast numbers?
- How can you find two ratios that describe the same relationship?
- What is the connection between ratios, fractions, and percents?
- How can you use percentages in real world contexts?
- How can we use part of a number to determine the original or the percent?

Unit Enduring Understandings:

- Ratios compare two values.
- Unit rates are a/b given that the ratio is $a:b$, such that $b \neq 0$.
- Percents are per one hundred
- Percents apply to real world situations we encounter every day

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 4 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Alternative Assessment: Bouncing Balls Project (Big Ideas Math (green book), Chapter 5 Resources)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLS)	Pacing
Write ratios	Content: Ratio Equivalent Skills: Writing ratios in 3 different ways Identifying equivalent ratios	Whole Class Game: Teams determine if the ratios on the SMARTboard are equivalent to the original ratio. Students record their answers on a clear communicator	6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities	1 lesson
Use ratio tables to problem solve Graph ratios on a Coordinate plane	Content: Equivalent ratios Coordinate plane Skills: Create a ratio table to model a real life situation Graph coordinates on a Coordinate Plane	Group Activity: Students will work in teams to complete ratio tables and find a missing value. Students will graph their tables on Quadrant I of the Coordinate Plane.	6.RP.3a Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.	2 lessons

Use tape diagrams to problem solve	<p>Content: Tape diagram Ratio</p> <p>Skills: Create tape diagrams to model real life situations</p>	<p>Individual Activity: Students will use the Thinking Blocks Ratio website to model real world ratios</p> <p>Partner Activity: Students will create tape diagrams to model and solve ratio problems at stations posted around the room</p>	<p>6.RP.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.</p> <p>CRP11. Use technology to enhance productivity.</p> <p>8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.</p> <p>NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</p>	2 lessons
<p>Calculate unit rate and use it to problem solve.</p> <p>Use unit rate to determine a better buy comparison</p>	<p>Content: Rate Ratio Unit rate Better Buy</p> <p>Skills: Write unit rates Identify unit rates Calculate unit rates Compare unit rates to determine better buy</p>	<p>Partner Activity: Circuit Shopping activity to determine a better buy of various real world items using interactive google sheets.</p>	<p>6.RP.2 . Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.</p> <p>6.RP.A.3b-Solve unit rate problems including those involving unit pricing and constant speed.</p> <p>CRP11. Use technology to enhance productivity.</p> <p>8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.</p>	2 lessons
Use double number lines to problem solve	<p>Content: Double number lines Ratio</p> <p>Skills: Create double number lines to model a real life situation</p>	<p>Group Activity: Create double number line diagrams to model and solve ratio problems.</p>	<p>6.RP.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.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p>	3 lessons
Solve real world problems involving tax, tip, discount with percents	<p>Content: Percent Discount Tax Tip</p> <p>Skills: Shade hundreds grids to represent a fraction, decimal, and percent Use multiplication with fractions or decimals to determine the percent of a whole Add or subtract the part and whole to find a total</p>	<p>Group activity: Differentiated percent problem solving placemat to practice discount, tax, tip and finding percent.</p> <p>Partner Activity: Fraction, decimal percent matching activity Madison Shopping Activity</p>	<p>6.RP.2 Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.</p> <p>9.1.8.E.4 Prioritize personal wants and needs when making purchases</p>	6 lessons
<p>Use the part and the whole to calculate a percent</p> <p>Use the part and the percent to calculate the whole</p>	<p>Content: Part Whole</p> <p>Skills: Write fractions and decimals as percents</p>	<p>Group Activity: Use the percent pyramid to organize information from word problems and solve.</p>	<p>6.RP.3c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.</p>	2 lessons

Convert measurement units by utilizing ration reasoning	<p>Content: Customary Units Metric Units</p> <p>Skills: Use conversion factors (ratios) to convert units</p>	<p>Partner Activity: Students will work to complete task cards involving measurement conversion. Students will reference the PARCC conversion sheet.</p>	<p>3.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p> <p>8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.</p>	2 lessons
---	--	--	---	-----------

Unit 5 Rational Numbers and Coordinate Plane

Unit Title: Rational Numbers and Coordinate Plane

Unit Summary:

This unit provides the language for understanding and classifying rational numbers. Students will identify where numbers are on a number line and compare positive and negative values. Students will understand real world contexts that can be represented by negative numbers. This unit will teach absolute value and how to apply it to problem solving. The coordinate plane is introduced with plotting points in all four quadrants and connecting points to create rectangles.

Suggested Pacing:9 lessons, 1 Review, 1 Quest = 11 days

Learning Targets

Unit Essential Questions:

- What are some rational numbers around us?
- What are some non-rational numbers around us?
- How can ordering of rational numbers help to make sense of the world around us?
- When is the absolute value of a rational number used in real life?
- How can you use a number line to order real-life events?
- How can you use a Coordinate Plane to display data?

Unit Enduring Understandings:

- 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).
- A rational number is a point on the number line.
- Rational numbers on the number line are oriented from left to right
- Rational numbers have an order that exists related to their location on a number line.
- The absolute value of a rational number is its distance from 0 on the number line.
- The distance from a point on the coordinate system to the origin (0,0) is related to the absolute value of its x and y- coordinates .

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 5 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSL)	Pacing
Compare and order integers on a number line Identify the opposite of an integer	Content: Positive and negative integers Real world situations Opposites Skills: Ordering integers Finding the opposite of a number Plotting integers on a number line	Partner activity: Ordering integer cards	6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers. 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.7a-Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.	1 lesson
Compare and order rational numbers	Content: Rational number Irrational number Skills: Plotting values on a number line Determine if a number is rational	Group Activity: Rational Number sort - groups are given cards to sort into categories, rational numbers, whole numbers, and integers.	6.NS.C6- Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. 6.NS.C.7b-Write, interpret, and explain statements of order for rational numbers in real-world contexts. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.	1 lesson
Creating story problems with integers	Content: Integers Plotting on a number line Skills: Determining a real world situation for an integer Plotting the real world situation on a number line	Group activity: Matching number, its opposite, positive situation, negative situation, and then creating your own set of four cards.	6.NS.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. CRP6. Demonstrate creativity and innovation.	1 lesson
Find the absolute value of a number	Content: Absolute Value Skills: Finding absolute value	Class Activity: Guessing Celebrity ages to calculate distance from actual age using absolute value.	6.NS.C7c- 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.	2 lessons

	Recognizing absolute value as distance from 0		7d-Distinguish comparisons of absolute value from statements about order.	
Graph on the coordinate plane Reflect points across one or both axes	Content: Coordinate Plane Quadrants Axes Plotting Reflecting Skills: Plot ordered pairs on a coordinate plane Identifying the quadrant or axes in/on which a point lies Reflect a point or a shape around a given axis and recording the new location(s)	Individual activity: Students will practice plotting coordinate points to create various pictures. (differentiated picture outcomes)	6.NS. 6b 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. c. 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.C8-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.	3 lessons
Find area and perimeter of rectangles on the coordinate plane	Content: Plotting Points Area Perimeter Rectangles Distance on a coordinate plane Skills: Plotting points Calculating area and perimeter Determining the distance between two points	Partner Activity: Students will graph and reflect points to create various rectangles. They will determine the side lengths and calculate area and perimeter	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.	1 lesson

Unit 6 Equations and Inequalities

Unit Title: Equations and Inequalities

Unit Summary:

This unit will build upon students' understanding of algebraic expressions to introduce equations and inequalities. Students will reason about and solve one-variable equations and inequalities and graph their solutions on a number line. Students will learn about the similarities and differences between solutions to equations and inequalities. Independent and dependent variables will be introduced and students will create equations, inequalities, and graphs to display the relationship between two variables in real world contexts.

Suggested Pacing: 15 lessons, 2 Review, 1 Quiz, 1 Test = 19 days

Learning Targets

Unit Essential Questions:

- What is the difference between an equation, an expression, and an inequality?
- What does it mean when a number does not satisfy an equation or inequality?

- How can we represent the relationship between two variables?
- How can one tell that there is a relationship between two quantities?
- Why is it useful to write an equation to express one quantity in terms of another quantity?

Unit Enduring Understandings:

- Solving an equation or inequality will find the value(s) that will make the statement true.
- A variable can represent an unknown number or any number in a specified set.
- Quantities can change in relation to one another and the relationship can be expressed as an equation relating the two.
- The value of one quantity determines the value of the second quantity.
- Two quantities may or may not be related.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 6 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Write equations to represent verbal sentences and real world situations	<p>Content: Equation Let Statement</p> <p>Skills: Writing equations to match real world situations Writing a Let Statement to define a variable</p>	<p>Class Activity: Vending Machine - Students participate in an introduction equation activity. They are given combinations of blocks to discover how much vending machine items cost. They use logical reasoning and equations to figure out values for unknowns.</p> <p>Group Activity: Cut and match and real world situations to equations.</p> <p>Individual Activity: Scavenger hunt to find translated phrases and riddle clues around classroom.</p>	<p>6.EE.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.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p>	2 lessons
Solve One Step Equations	<p>Contents: Inverse operations</p> <p>Skills: Using addition or subtraction to solve equations</p>	Group activity: Use bags and chips to model equations and solve with inverse operations.	6.EE.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	4 lessons

	Substitute a value of variable to check solution Using multiplication or division to solve equations Solve real life word problems by writing let statements and solving equations		specified set makes an equation or inequality true. 6.EE.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.	
Graph equations using a table	Content: Independent Variable Dependent Variable Increasing Decreasing Table Skills: Creating a table to represent the relationship Graphing equations on a coordinate plane using a table of values Identifying the independent and dependent variables Identifying if the relationship is increasing or decreasing	Group activity: Problem solve using a Great Adventure activity to derive equation that matches situation. Then graph results on a coordinate plane.	6.EE.C.9 Represent and analyze quantitative relationships between dependent and independent variables. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time. CRP2. Apply appropriate academic and technical skills. 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results NJSLA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.	4 lessons
Write inequalities to represent verbal sentences and real world situations	Content: Let Statement Inequality Skills: Writing inequalities to match real world situations Writing a Let Statement to represent a variable	Group activity: Complete a graphic organizer to record inequalities and possible words to translate the meanings.	6.EE.B 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.8 - Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	2 lessons
Solve One Step Inequalities and Graph solutions on a number line	Content: Inverse Operation Open Circle Closed Circle Direction of shading Skills:	Partner Activity: Students will cut out real world situations, inequalities, and solutions on a number line. They will match each of the situations to the inequality and solution.	6.EE.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.	3 lessons

	Using addition or subtraction to solve inequalities Substitute a value of variable to check solution Using multiplication or division to solve inequalities Solve real life word problems by writing let statements and solving inequalities Use an open circle or closed circle to match the inequality symbol Determine the direction of the arrow on the graph to match the inequality symbol			
--	---	--	--	--

Unit 7 Geometry

Unit Title: Geometry

Unit Summary:

This unit focuses on reasoning about relationships among shapes to determine area, surface area, and volume. Students will calculate areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths.

Suggested Pacing: 16 lessons (OL) 18 lessons (ACC), 2 Review, 1 Quiz, 1 Test = 20-22 days

Learning Targets

Unit Essential Questions:

- Why would one want to calculate areas of polygons?
- How are areas of polygons found?
- How are volume and surface area of a right rectangular prism found?
- Why are volumes represented in cubic units?
- What is the connection between the net and surface area of 3-D figures?

Unit Enduring Understandings:

- Triangles and rectangles can be used to find areas of other polygons.
- A 2-D net of a 3-D figure can be used to find the surface area of the figure.
- Surface area is related to “wrapping” or “covering” of a surface with square units, i.e. squares with side length of one unit.
- Volume is related to “filling” of space with cubic units, i.e. cubes with edges of one-unit length.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 7 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Alternative Assessment: Fishy Findings Project (Big Ideas Math (green book) Chapter 8 resources)

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Classify Polygons	Content: Polygon (triangle, quadrilateral...) Equilateral Regular Skills: Identify the number of sides of a polygon to determine its name	Group Activity: Students will sort polygons into groups based on characteristics like number of sides.	5.G.B Classify two-dimensional figures into categories based on their properties. 3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.</i> 4. Classify two-dimensional figures in a hierarchy based on properties. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.	1 lesson
Calculate Area & Perimeter of Rectangles Calculate Area of Parallelograms	Content: Area Perimeter Formula for Area Height Base Perpendicular Skills: Determine the base and height of a quadrilateral Calculate the area of rectangles Identify the height of a parallelogram as being perpendicular to the base Calculate the area of parallelograms	Guided Activity: Students will create a parallelogram on grid paper, then draw in the perpendicular height. Students will cut out the triangle formed on their parallelogram, and move it to form a rectangle. Students will derive the formula for the area of parallelograms.	6.G.A. Solve real-world and mathematical problems involving area, surface area, and volume. 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.	2 lessons
Classify Triangles Calculate Area of Triangles	Content: Equilateral Isosceles Scalene Acute Right Obtuse Formula for Area Skills:	Group activity: Students will sort triangles into groups based on characteristics like number of congruent sides or angle measurements. Guided Activity: Students will create a quadrilateral on grid paper, then fold it in half to form	6.G.A. Solve real-world and mathematical problems involving area, surface area, and volume. 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.	2 lessons

	Identifying a triangle based on characteristics Calculating the area of triangles	triangles. Students will derive the formula for the area of triangles.	CRP11. Use technology to enhance productivity.	
Calculate areas of figures using composition and decomposition	Content: Composite Decompose Skills: Breaking a composite figure into basic shapes Calculate the area of rectangles Calculate the area of parallelograms Calculating the area of triangles Adding together the areas of each of the individual shapes in the composite figure	Partner activity: Students will use geoboards to construct various shapes given constraints and then calculate area and/or perimeter. Students will complete composite golf game activity.	6.G.A. Solve real-world and mathematical problems involving area, surface area, and volume. 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. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.	2 lessons
Calculate the surface area of right rectangular prisms, triangular prisms, and pyramids by creating nets.	Content: Net Surface Area Skills: Draw a net of a prism or pyramid by "unfolding" the shape onto a sheet of paper Calculating the area of the basic shapes of the net Add together the areas of each of the individual shapes in the net	Partner Activity: Students will complete stations around the room involving word problems with real world 3D shapes.	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.	5 lessons
Calculate the volume of right rectangular prisms Calculate how many cubes of fractional side lengths fit inside a larger prism.	Content: Volume Skills: Use unit cube blocks to derive the formula for volume of rectangular prisms Calculate the volume of a rectangular prism using the formula Calculate how many cubes of fractional side lengths fit inside a larger prism	Partner Activity: Students will complete stations around the room involving word problems with 3D shapes.	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.	4 lessons
ACC Only Calculate the volume of triangular prisms	Content: Volume Skills: Applying the formula $V=BH$ for triangles.	Partner Activity: Students will trace Toblerone candy bars and find SA and Volume.	7.G.B. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	2 lessons

Unit 8 Statistics	
Unit Title: Statistics	
Unit Summary: In this Unit students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield	

different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

Suggested Pacing: 15 lessons, 2 Review, 1 Quiz, 1 Test = 19 days

Learning Targets

Unit Essential Questions:

- What is a statistical question?
- What is the difference between the center and the spread of a numerical set?
- How are data sets described?
- How can you visually represent data using a graph?

Unit Enduring Understandings:

- A set of data can be described by its center, variability, and overall shape.
- The center summarizes a data set with a single number.
- The spread is a measure of variation of all values in a dataset about the center.
- Data can be represented by multiple graphs and displays.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 8 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Math 6/Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Create and Identify Statistical Questions Identify if a Statistical Question is Numerical or Categorical	Content: Statistical Survey Numerical Categorical Skills: Determine if a question is statistical Write a statistical question that could be used to collect given data	Group Activity: Discuss and determine if given questions are statistical, categorical or numerical.	6.SP.A. Develop understanding of statistical variability. 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. 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.	1 lesson

	Determine if a statistical question is Numerical or Categorical		CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.	
<p>Calculate the Measures of Center (mean, median & mode)</p> <p>Calculate the Measures of Variability (Range)</p>	<p>Content: Mean Median Mode Range Center Variability</p> <p>Skills: Calculate the Mean of a data set and represent their work as a fraction Determine the Median of a data set Determine the Mode of a data set Calculate the Range of a data set Identify which statistical measures represent center Identify which statistical measures represent variability</p>	<p>Group Activity: Students work with stacking blocks to represent values. They move blocks to see the mean value equally distributes the data. Students practice calculating mean, median, mode and range.</p>	<p>6.SP.A. Develop understanding of statistical variability. 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. 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.</p> <p>6.SP.B. Summarize and describe distributions. 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. 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results</p>	2 lessons
<p>Interpret and create line plots, frequency tables, and histograms</p>	<p>Content: Line Plot Frequency Table Interval Frequency Cumulative Frequency Relative Frequency Histogram</p> <p>Skills: Create a line plot given a list of data Create a line plot given measures of center and variability Interpret a line plot Create a frequency table with equal intervals Calculate the cumulative frequency Calculate the relative frequency as a fraction, decimal, and percent Create a histogram from a frequency table Interpret frequency tables and histograms</p>	<p>Class Activity: Students record the total number of letters in their name on a post-it. Data collected is used to create a class line plot</p> <p>Group Activity: Class collected data on average screen time a 6th grader uses for a week. Students used results to create frequency table and histogram. Then analyzed results.</p>	<p>6.SP.B. Summarize and describe distributions. 4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>NJSLSA.SL5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.</p>	6 lessons
<p>Describe the shape of a graph as approximately symmetrical, skewed left, or skewed right</p> <p>Determine the best measure of center based on the shape of the graph</p> <p>Determine the best measure of variability</p>	<p>Content: Skewed Left Skewed Right Approximately Symmetrical Measure of Center Measure of Variability Outliers</p> <p>Skills:</p>	<p>Group Activity: Students receive data from 2 Assessments, both of which have the same range. Students compare the data, their measures of center, and their graphs to show that one is symmetrical and one is skewed because of the outliers.</p>	<p>6.SP.A. Develop understanding of statistical variability. 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. 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.</p>	1 lesson

based on the shape of the graph	Determine the shape of a graph by identifying the location of the outliers. Determine the best measure of center based on the shape of the graph. Determine the best measure of variability based on the shape of the graph.		<p>6.SP.B. Summarize and describe distributions.</p> <p>5. Summarize numerical data sets in relation to their context, such as by:</p> <ul style="list-style-type: none"> 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. <p>CRP4. Communicate clearly and effectively and with reason.</p> <p>9.1.8.E.5 Analyze interest rates and fees associated with financial services, credit cards, debit cards, and gifts.</p>	
Interpret and create box and whisker plots	<p>Content:</p> <p>Box and Whisker Plot Lower Quartile Upper Quartile Lower Extreme Upper Extreme Interquartile Range 5 Number Summary</p> <p>Skills:</p> <p>Determine the median, quartiles, and extremes Calculate the IQR Create a Box and Whisker Plot Interpret a Box and Whisker Plot</p>	<p>Group Activity:</p> <p>Students are given a pile of fish to organize from smallest to largest. Students use the ordered data to calculate the 5 number summary and build a Box and Whisker Plot.</p>	<p>6.SP.B. Summarize and describe distributions.</p> <p>4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p>	2 lessons
Calculate the mean absolute deviation	<p>Content:</p> <p>Mean Absolute Deviation Deviation</p> <p>Skills:</p> <p>Calculate the mean of the original data Calculate the absolute deviations of each value from the mean Calculate the mean of the deviations</p>	<p>Group Activity:</p> <p>Students are given line plots of temperatures in various cities during the same month. Students use the data to order the cities by variability. Students calculate the MAD for select cities given the raw data.</p>	<p>6.SP.B. Summarize and describe distributions.</p> <p>5. Summarize numerical data sets in relation to their context, such as by:</p> <ul style="list-style-type: none"> 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. 	3 lessons

Unit 9 Integer Operations

Unit Title: Integer Operations (**Accelerated Math 6 Only**)

Unit Summary:

In this Unit students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students

explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

Suggested Pacing: 8 lessons, 1 Review, 1 Quest = 10 days

Learning Targets

Unit Essential Questions:

- Why does one need rational numbers?
- When does one use decimal forms versus fractional forms of rational numbers?
- In what real world contexts would negative numbers be used?

Unit Enduring Understandings:

- A number and its opposite have a sum of 0.
- A number and its opposite are called additive inverses.
- Absolute value represents distance on a number line, therefore it is always non-negative.
- Every quotient of integers (with non-zero divisor) is a rational number.
- If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$.
- The decimal form of a rational number terminates or eventually repeats.

Evidence of Learning

Formative Assessments: A variety of formative assessments will be used throughout the lesson, such as, observation, exit tickets, independent practice, activities, questioning and discussions

Summative Assessments: Unit 9 Assessment

This assessment will contain a variety of multiple choice, select all that apply, matching/sorting, open-ended, and/or short answer questions that will be common across all Accelerated Math 6 classes with flexibility for each teacher and level course to differentiate with additional questions, as appropriate. The assessment will contain questions that address the standards listed below.

Objectives (Students will be able to...)	Essential Content/Skills	Suggested Assessments	Standards (NJSLs)	Pacing
Add and subtract integers Multiply and divide integers Solve real world problems with integers.	Content: Integers Skills: Adding and subtracting integers Multiplying and dividing integers	Group Activity: Students will use chips and/or number lines to model addition, subtraction, multiplication, and division of integers.	7.NS.1A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. b. Understand $p + q$ as the number located a distance $ q $ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational	4 lessons
Order of Operations with Integers Distributive Property with Integers	Content: Order of Operations PEMDAS Distributive Property Skills:	Group Activity: Students will work collaboratively to complete an "I Have, You Have" activity on order of operations with integers.		2 lessons

	Apply order of operations to expressions with integers		<p>numbers by describing real-world contexts.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, New Jersey Student Learning Standards for Mathematics 50 then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p> <p>3. Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p>8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.</p> <p>CRP4. Communicate clearly and effectively and with reason.</p>	
<p>Adding and Subtracting Rational Numbers*</p> <p>Multiplying and Dividing Rational Numbers*</p> <p>*Operations with rational numbers if time allows</p>	<p>Content: Rational Numbers</p> <p>Skills: Adding and subtracting rational numbers Multiplying and dividing rational numbers</p>	Group Activity: Students will complete a placemat activity on operations with rational numbers.		2 lessons