Mathematics Department

Grade 7 Pre-Algebra

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Scope and Sequence

Month	Grade 7 Pre-Algebra	Grade 7 Accelerated Pre-Algebra
September	**Assessment #1:** Baseline Assessment Baseline Assessment **Topic** - Real Number System - Chapter 1 **Prerequisites:** ● Recognizing types of numbers ● Using long division to find a decimal equivalent **Objectives**: ● Understand the real number system and the real number line ● Identify the numbers that make up the set of rational and irrational numbers ● Express all rational numbers in m/n form ● Write rational numbers as terminating or repeating decimals using long division **Additional Notes:** ● Only cover Chapter 1.1 and 1.2 ● Before teaching from Chapter 1 - organize real number system ○ Use a Real Number System diagram ○ Teach rational numbers as a set of numbers including integers, whole, counting numbers	**Assessment #1:** Baseline Assessment Baseline Assessment **Topic** - Real Number System - Chapter 1 **Prerequisites:** ● Recognizing types of numbers ● Understand that there is a positive and negative side of the number line ● Determining absolute value ● Using long division to find a decimal equivalent ● Understand place value **Objectives**: ● Understand the real number system and the real number line ● Identify the numbers that make up the set of rational and irrational numbers ● Express all rational numbers in m/n form ● Write rational numbers as terminating or repeating decimals using long division ● Understand the absolute values of rational numbers as a distance from zero ● Locate rational numbers on a number line ● Compare rational numbers using the real number line and absolute value **Additional Notes:**

	○ Briefly Teach irrational numbers as non-terminating and non-repeating ○ Teach Pi and non-perfect squares as other examples of irrational numbers Note: ❖ Eliminate rational vs irrational. Briefly describe the difference, but we focus on rational numbers in 7th grade.	● Only cover Chapter 1.1 and 1.2 ● Before teaching from Chapter 1 - organize real number system ○ Use a Real Number System diagram ○ Teach rational numbers as a set of numbers including integers, whole, counting numbers ○ Briefly Teach irrational numbers as non-terminating and non-repeating ○ Teach Pi and non-perfect squares as other examples of irrational numbers ● Use a four-step strategy to locate rational numbers on a number line ○ (I) order from least to greatest ○ (II) fill-in appropriate integers ○ (III) fill-in appropriate intervals ○ (IV) plot numbers on number line ***Assess Chapter 1 Skills***
October	**Topic** - Real Number System - Chapter 1 (con't) **Prerequisites:** ● Understand that there is a positive and negative side of the number line ● Determining absolute value ● Understand place value **Objectives:** ● Understand the absolute values of rational numbers as a distance from zero ● Locate rational numbers on a number line ● Compare rational numbers using the real number line and absolute value **Additional Notes:** ● Use a four-step strategy to locate rational numbers on a number line ○ (I) order from least to greatest ○ (II) fill-in appropriate integers ○ (III) fill-in appropriate intervals ○ (IV) plot numbers on number line ***2nd Week of October - Assess Chapter 1*** **Topic** - Operations with Rational Numbers - Chapter 2 **Prerequisites:**	**Topic** - Operations with Rational Numbers - Chapter 2 **Prerequisites:** ● Expressing improper fractions and mixed numbers in other forms ● Operations with positive fractions and decimals **Objectives:** ● Perform operations with positive and negative integers ● Apply order of operations with positive and negative integers ● Represent and solve real-world mathematical problems with positive and negative integers using all four operations ● Perform operations with positive and negative fractions ● Perform operations with positive and negative decimals ● Apply order of operations to simplify rational number expressions ● Represent and solve real-world mathematical problems with rational numbers using all four operations **Additional Notes:** ● Student should not be using calculators in

	● Expressing improper fractions and mixed numbers in other forms ● Operations with positive fractions and decimals **Objectives:** ● Perform operations with positive and negative integers ● Apply order of operations with positive and negative integers ● Represent and solve real-world mathematical problems with positive and negative integers using all four operations **Additional Notes:** ● Student should not be using calculators in Chapter 2 (especially in sections 2.1 - 2.4) ● Introduce concepts using word problems; Include word problems throughout instead of at the end of a section ● Use red/yellow counters for visual representation of addition and subtraction of integers ● Provide and Emphasize the use of the *Integer Cheat Sheet/* anchor charts Notes: ❖ Continue teaching operations through word problems, instead of at the end of the chapter. ❖ Emphasize the understanding of the rules, and importance of mental math with integers ❖ Students may be using calculators during independent work ❖ Include questions that ask students to explain how they know. ❖ Continue using red/yellow chips to explain on video. Students can take pictures or illustrate in order to explain their answers.	Chapter 2 (especially in sections 2.1 - 2.4) ● Introduce concepts using word problems; Include word problems throughout instead of at the end of a section ● Provide and Emphasize the use of the *Integer Cheat Sheet/* anchor charts ● Include 7th grade word problems throughout Chapter 2 instead of at the end ● Include NJSLA style questions involving rational number operations on quizzes, exit passes, and other assessments throughout chapter 2 ○ Pull from COACH resources Notes: ❖ Continue teaching operations through word problems, instead of at the end of the chapter. ❖ Emphasize the understanding of the rules, and importance of mental math with integers ❖ Students may be using calculators during independent work ❖ Include questions that ask students to explain how they know. ***Assess Chapter 2 Skills***
Novembe r	**Topic** - Operations with Rational Numbers - Chapter 2 (con't) **Prerequisites:** ● Expressing improper fractions and mixed numbers in other forms ● Operations with positive fractions and decimals	**Assessment #2** - Benchmark #1 *(Prior to Algebraic Topics)* ● Real Number System ● Rational Number Operations **Topic** - Algebraic Expressions - Chapter 3 **Prerequisites:**

	Objectives: ● Perform operations with positive and negative fractions ● Perform operations with positive and negative decimals ● Apply order of operations to simplify rational number expressions ● Represent and solve real-world mathematical problems with rational numbers using all four operations **Additional Notes:** ● Include 7th grade word problems throughout Chapter 2 instead of at the end ● Include NJSLA style questions involving rational number operations on quizzes, exit passes, and other assessments throughout chapter 2 ○ Pull from COACH resources Note: ❖ Include questions on assignments that ask students to explain the process/how do you know? ***End of November - Assess Chapter 2***	● Recognizing parts of an algebraic expression ● Evaluating algebraic expressions (*w/ integers*) ● Simplifying algebraic expressions (*w/ integers*) ● Expanding algebraic expressions using the distributive property (*w/ integers*) ● Factoring algebraic expressions (*w/ integers*) ● Recognizing equivalent expressions (*w/ integers*) ● Writing algebraic expressions to represent unknown quantities (*w/ integers*) **Objectives:** ● Translate a verbal description into an algebraic expression ● Simplify rational number algebraic expressions by combining like terms ● Expand rational number algebraic expressions ● Factor algebraic expressions ● Solve real-world problems using algebraic reasoning **Additional Notes:** ● Use 6th grade word problems to introduce more complex 7th grade word problems ● Mention using the commutative property of addition to help students combine like terms ● Teach students that expanding is using the distributive property to simplify an expression ● Include 7th grade word problems throughout Chapter 3 instead of at the end ● Include NJSLA style questions involving expressions on quizzes, exit passes, and other assessments throughout chapter 3 ○ Pull from COACH resources
Decembe r	**Common Assessment #2** - Benchmark #1 *(Prior to Algebraic Topics)* ● Real Number System ● Rational Number Operations **Topic** - Algebraic Expressions - Chapter 3 **Prerequisites:** ● Recognizing parts of an algebraic	***Assess Chapter 3*** **Topic** - Algebraic Equations - Chapter 4 **Prerequisites:** ● Graphing inequalities on a number line ● Writing algebraic inequalities **Objectives:** ● Identify equivalent equations

	expression ● Evaluating algebraic expressions (*w/ integers*) ● Simplifying algebraic expressions (*w/ integers*) ● Expanding algebraic expressions using the distributive property (*w/ integers*) ● Factoring algebraic expressions (*w/ integers*) ● Recognizing equivalent expressions (*w/ integers*) ● Writing algebraic expressions to represent unknown quantities (*w/ integers*) **Objectives:** ● Translate a verbal description into an algebraic expression ● Simplify rational number algebraic expressions by combining like terms ● Expand rational number algebraic expressions ● Factor algebraic expressions ● Solve real-world problems using algebraic reasoning **Additional Notes:** ● Use expressions with positive integers (from 6th grade) to introduce concepts of evaluating/simplifying/expanding/factoring expressions in 7th grade problems ● Use 6th grade word problems to introduce more complex 7th grade word problems ● Mention using the commutative property of addition to help students combine like terms ● Teach students that expanding is using the distributive property to simplify an expression ● Include 7th grade word problems throughout Chapter 3 instead of at the end ● Include NJSLA style questions involving expressions on quizzes, exit passes, and other assessments throughout chapter 3 ○ Pull from COACH resources	● Solve algebraic equations with varying steps ● Solve real-world problems algebraically ● Solve algebraic inequalities with varying steps ● Graph the solution set of an inequality on a number line ● Solve real-world problems involving inequalities **Additional Notes:** ● Begin Chapter 4 using an algebraic word problem to see how much students know before learning how to solve multi-step equations ● Teach two-step with rational terms, then with variables on same side, variables on both sides, equations in factored form ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving equations on quizzes, exit passes, and other assessments throughout chapter 4 ○ Pull from COACH resources ● Begin inequality sections using an algebraic word problem to see how much students know before learning how to solve multi-step inequalities ● Emphasize and use keywords in order to write the correct inequality from a word problem ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 4 ○ Pull from COACH resources
January	***Beginning of January - Assess Chapter 3*** **Topic** - Algebraic Equations - Chapter 4	***Assess Chapter 4*** **Topic** - Proportional Relationships - Chapter 5

	Prerequisites: ● Graphing inequalities on a number line ● Writing algebraic inequalities **Objectives:** ● Identify equivalent equations ● Solve algebraic equations with varying steps ● Solve real-world problems algebraically **Additional Notes:** ● Begin Chapter 4 using an algebraic word problem to see how much students know before learning how to solve multi-step equations ● Introduce solving equations with 6th grade equations; 1 and 2 step equations with positive terms only ● Teach two-step with rational terms, then with variables on same side, variables on both sides, equations in factored form ● Use 6th grade word problems to introduce more complex 7th grade word problem ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving equations on quizzes, exit passes, and other assessments throughout chapter 4 ○ Pull from COACH resources	**Prerequisites:** ● Compare quantities using a ratio ● Recognize equivalent ratios ● Finding rates and unit rates ● Identifying and plotting coordinates ● Solving percent problems **Objectives:** ● Use proportional relationships to solve multistep ratio and percent problems. ● Identify direct proportions using tables and equations ● Recognize that a constant of proportionality can be a constant rate ● Use a graph to interpret direct proportion ● Solve real-world direct proportion problems **Additional Notes:** ● Only cover Chapter 5.1 - 5.3 (NO inverse proportions) ● Prior to Chapter 5 review one-step percent problems; finding part, whole and percent. ○ Use one-step word problems involving tax, tip, discount style questions ● Introduce 7th grade percent problems by introducing problems in which the whole is not a factor of 100 ● 7th grade problems should be solved using a proportion and cross products ○ Example problems include topics like; simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 5
February	**Topic** - Algebraic Inequalities - Chapter 4 (con't) **Prerequisites:** ● Graphing inequalities on a number line ● Writing algebraic inequalities **Objectives:** ● Solve algebraic inequalities with varying steps ● Graph the solution set of an inequality on a	***Assess Chapter 5*** **Assessment #3** - Benchmark #2 (SPRING SGO?) *Chapter 3,4, and 5* **Topic** - Geometry - Chapter 6 and 7 **Prerequisites:** ● Classify angles as acute, right, or obtuse

	number line ● Solve real-world problems involving inequalities **Additional Notes:** ● Begin inequality sections using an algebraic word problem to see how much students know before learning how to solve multi-step inequalities ● Students should be able to solve 7th grade inequalities without a review of 6th grade inequalities ● Emphasize and use keywords in order to write the correct inequality from a word problem ● Use 6th grade word problems to introduce more complex 7th grade word problem ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 4 ○ Pull from COACH resources	● Identify parallel and perpendicular lines **Objectives:** ● Solve problems involving scale drawing of geometric figures (7.5) ● Construct a triangle with given measures (7.3) ● Determine whether a unique triangle, more than one triangle, or no triangle can be drawn (7.3) ● Explore the properties of complementary, supplementary adjacent and vertical angles (6.1) ● Explore and apply the properties of angles at a point (6.2) **Additional Notes:** ● When teaching scale factor focus on; ○ Computing actual lengths and area from a scale drawing ○ Reproducing a scale drawing at a different scale ● Teach students how to construct triangles given 3 angle measures or 3 sides lengths using a compass, protractor and ruler ***Assess Chapter 6 and 7***
March	***Beginning of March - Assess Chapter 4 Skills*** **Topic** - Proportional Relationships - Chapter 5 **Prerequisites:** ● Compare quantities using a ratio ● Recognize equivalent ratios ● Finding rates and unit rates ● Identifying and plotting coordinates ● Solving percent problems **Objectives:** ● Use proportional relationships to solve multistep ratio and percent problems. ● Identify direct proportions using tables and equations ● Recognize that a constant of proportionality can be a constant rate ● Use a graph to interpret direct proportion ● Solve real-world direct proportion problems	**Topic** - Geometry - Chapter 8 **Prerequisites:** ● Apply surface area and volume formulas for prisms ● Find surface area of a square pyramid ● Find area and circumference of a circle ● Identify nets of prisms and pyramids **Objectives:** ● Calculate the area and circumference of a circle ● Recognize cylinders, cones, prisms and pyramids ● Identify cross sections of solids ● Calculate the surface area of prisms, cylinders, pyramids, and cones ● Calculate the volume of prisms, cylinders, pyramids, and cones ● Solve real-world problems involving composite figures

	Additional Notes: ● Only cover Chapter 5.1 - 5.3 (NO inverse proportions) ● Prior to Chapter 5 review one-step percent problems; finding part, whole and percent. ○ Use one-step word problems involving tax, tip, discount style questions ● Introduce 7th grade percent problems by introducing problems in which the whole is not a factor of 100 ● 7th grade problems should be solved using a proportion and cross products ○ Example problems include topics like; simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 5 ***End of March - Assess Chapter 5 Skills*** **Assessment #3** - Benchmark #2 (POSSIBLE SPRING SGO) *Chapter 3,4, and 5*	**Additional Notes:** ● Use videos/technology to show students cross sections of 3-D figures ○ https://www.geogebra.org/m/XCZwsytr#material/HSgSE469 ● Provide students with a *Surface Area and Volume Cheat Sheet* (aligned to NJSLA references) ○ On assessments, students should not have any reference material ● Use water proof to show students the volume of a cone/pyramids ○ https://www.youtube.com/watch?v=0ZACAU4SGyM&disable_polymer=true ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 8 ○ Pull from COACH resources ***Assess Chapter 8 Skills***
April	**Topic** - Geometry - Chapter 6 and 7 **Prerequisites:** ● Classify angles as acute, right, or obtuse ● Identify parallel and perpendicular lines **Objectives:** ● Solve problems involving scale drawing of geometric figures (7.5) ● Construct a triangle with given measures (7.3) ● Determine whether a unique triangle, more than one triangle, or no triangle can be drawn (7.3) ● Explore the properties of complementary, supplementary adjacent and vertical angles (6.1) ● Explore and apply the properties of angles at a point (6.2)	**Topic** - Probability - Chapter 10 **Prerequisites:** ● Expressing a part of a whole as a fraction and a percent ● Expressing a fraction, decimal, ratio, or percent as another form ● Find the mean and median of a set of data ● Drawing frequency and dot plots ● Solving a histogram problem **Objectives:** ● Defining outcomes, events, sample spaces ● Finding probability of events ● Approximating probability and relative frequency ● Developing probability models **Additional Notes:** ● Allow students to perform their own small

	Additional Notes: ● When teaching scale factor focus on; ○ Computing actual lengths and area from a scale drawing ○ Reproducing a scale drawing at a different scale ● Teach students how to construct triangles given 3 angle measures or 3 sides lengths using a compass, protractor and ruler ● Leave time at the end of the objectives above to prep for NJSLA ○ Mini-lessons on probability and statistics ***End of April Assess Chapter 6 and 7 Skills***	experiments to help them understand the process and understand a word problem that involves more events and outcomes. ○ Rolling number cubes, flipping a coin, etc ● Use lists, tables and tree diagrams in notes, warm-ups, exit passes and other assessments ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 10 ○ Pull from COACH resources ● Leave time between chapter 10 and NJSLA for a review/prep ○ Mini-lessons on statistics and data analysis ***Assess Chapter 10***
May	**Topic** - Geometry - Chapter 8 **Prerequisites:** ● Apply surface area and volume formulas for prisms ● Find surface area of a square pyramid ● Find area and circumference of a circle ● Identify nets of prisms and pyramids **Objectives:** ● Calculate the area and circumference of a circle ● Recognize cylinders, cones, prisms and pyramids ● Identify cross sections of solids ● Calculate the surface area of prisms, cylinders, pyramids, and cones ● Calculate the volume of prisms, cylinders, pyramids, and cones ● Solve real-world problems involving composite figures **Additional Notes:** ● Use videos/technology to show students cross sections of 3-D figures ○ https://www.geogebra.org/m/XCZwsytr#material/HSgSE469 ○ For hands-on use playdough and floss ● Provide students with a *Surface Area and Volume Cheat Sheet* (aligned to NJSLA references)	**Topic** - Statistics - Chapter 9 **Prerequisites:** ● Calculate and interpret measures of central tendency such as mean and/or median ● Calculate and interpret measures of variation such as range, interquartile range, and/or mean absolute deviation **Objectives:** ● Make inferences and generalizations of a population based upon a sample of the population ● Use measures of center and variability to compare two populations **Additional Notes:** ● While reviewing how to calculate measures of center and variability, provide students with basic inference statements so that students are able to make inferences about two populations. ○ *Example; the mean height of the football team is 65 inches but the M.A.D is 2, so the team consists of players that are relatively the same height of around 65 inches.* ● Cover Section 9.4 and 9.5 ○ 9.1 and 9.3 are meant to be covered in 6th grade ● Include stem-and-leaf plots within word problems

	○ On quizzes students should be provided with general formulas - but memorize specifics for each figure ● Use geometry manipulatives to help students visualize the nets of prisms and pyramids ● Use water proof to show students the volume of a cone/pyramids ○ https://www.youtube.com/watch?v=0ZACAU4SGyM&disable_polymer=true ● Include 7th grade word problems throughout instead of at the end ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 8 ○ Pull from COACH resources ***Assess Chapter 8 Skills***	● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 9 ○ Pull from COACH resources ***Assess Chapter 9***
June	**Topic** - Probability - Chapter 10 **Prerequisites:** ● Expressing a part of a whole as a fraction and a percent ● Expressing a fraction, decimal, ratio, or percent as another form ● Find the mean and median of a set of data ● Drawing frequency and dot plots ● Solving a histogram problem **Objectives:** ● Defining outcomes, events, sample spaces ● Finding probability of events ● Approximating probability and relative frequency ● Developing probability models ● Understand and represent compound events ● Understand independent and dependent events ● Use the multiplication rule of probability to solve problems with independent and dependent events ● Use the addition rule of probability to solve problems with independent and dependent events **Additional Notes:** ● Use Grade 7 Chapter 10 to teach students	**Topic** - Linear Equations **Prerequisites:** ● Solve multi-step equations with rational terms. ● Create a line on a coordinate plane given x and y-coordinates. **Objectives:** ● Solve linear equations ● Identify types of solutions as one solution, no solution or infinitely many solutions. ● Evaluate linear equations ● Write a linear equation in terms of one variable ● Graphing a linear equation on a coordinate plane ● Find the slope of a line **Additional Notes:** ● Pull for Grade 8 Chapter 3 and 4 ● Students should be implementing the “clearing the fractions” method when solving linear equations. ● Use table of values when evaluating linear equations ● When discussing slope, first introduce slope as “rise over run” using a graph.

	the meaning of probability, develop probability models and use relative frequencies ● Use Grade 8 Chapter 11 to teach students the meaning of compound event probability and how to find it ● Allow students to perform their own small experiments to help them understand the process and understand a word problem that involves more events and outcomes. ○ Rolling number cubes, flipping a coin, etc ● Use lists, tables and tree diagrams in notes, warm-ups, exit passes and other assessments ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 10 ○ Pull from COACH resources **Topic** - Statistics - Chapter 9 **Prerequisites:** ● Calculate and interpret measures of central tendency such as mean and/or median ● Calculate and interpret measures of variation such as range, interquartile range, and/or mean absolute deviation **Objectives:** ● Make inferences and generalizations of a population based upon a sample of the population ● Use measures of center and variability to compare two populations **Additional Notes:** ● Cover Section 9.4 and 9.5 ○ 9.1 and 9.3 are meant to be covered in 6th grade ● Include stem-and-leaf plots within word problems ● While reviewing how to calculate measures of center and variability, provide students with basic inference statements so that students are able to make inferences about two populations. ○ *Example; the mean height of the football team is 65 inches but the*	

	M.A.D is 2, so the team consists of players that are relatively the same height of around 65 inches. ● Include NJSLA style questions involving inequalities on quizzes, exit passes, and other assessments throughout chapter 9 ○ Pull from COACH resources	

Unit 1
The Real Number System
Summary and Rationale
In this unit, students extend their knowledge of numbers (whole numbers, integers, fractions, and decimals) to irrational numbers. They identify the numbers that make up the set of rational numbers and those that make up the set of real numbers. They locate numbers from both sets on the number line. Students add and subtract integers with the same sign and with different signs. They learn how to add integers to their opposites and subtract integers by adding their opposites. Students find the distance between two integers on a number line. Students multiply and divide integers and then evaluate expressions that include any combination of operations.

Students extend their operations skills to rational numbers, including decimals and percents, and they use their new skills to solve real-world problems.

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 8 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 6 weeks

Standards

The Number System	
7.NS.A.1.a	Describe situations in which opposite quantities combine to make 0. For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?
7.NS.A.1.b	Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.A.1.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.
7.NS.A.1.d	Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.A.2.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.
7.NS.A.2.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.
7.NS.A.2.c	Apply properties of operations as strategies to multiply and divide rational numbers
7.NS.A.2.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.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers
Interdisciplinary Connections	

NJSLSA	
A.R.1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
A.R.7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
MS-PS1-4 (Next Gen Sci)	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.1.8.CDM.3	Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each
9.1.8.CDM.4	Compare and contrast loan management strategies, including interest charges and total principal repayment costs.
9.1.8.CP.1	Compare prices for the same goods or services.
9.1.8.FP.6	Compare and contrast advertising messages to understand what they are trying to accomplish.
9.1.8.PB.4	Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g. teenager, young adult, family)
9.1.8.PB.6	Construct a budget to save for short-term, long term, and charitable goals.
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
• Real numbers are represented as points on an infinite number line and are used to count, measure, estimate, or approximate quantities.	• What is a rational number? • How is an irrational number different from a rational number?

• A rational number is a number that can be written as a fraction, in the form a/b. • Between every pair of rational numbers, there is another rational number. Between any two real numbers, there is another real number. The real numbers, which contain both rational and irrational numbers, complete the real number line. • The square root of a number increases as the number increases. • The results of a calculation with measurements should not have more significant digits than the data used for the calculation. A result should never be more precise than the measures from which it was calculated. • The operations of addition, subtraction, multiplication, and division can be applied to rational numbers, including negative numbers. • Subtraction is the same as adding the opposite. • The product of two integers with the same sign is positive, and the product of two integers with different signs is negative. The same generalizations hold for division.	• What happens when you multiply or divide two negative numbers?

Evidence of Learning (Assessments)

Ongoing observation
Class Participation
Classwork
Problem of the Day/Week
Guided Practice
Warm-ups/Exit Tickets
Homework
Quizzes/Tests
Benchmark Assessments

Objectives (SLO)

Students will know:	Students will be able to:
● Set of Rational numbers ● Irrational numbers ● Terminating and Repeating Decimals ● Real number line ● Additive inverse ● Zero pair ● Complex fraction ● Least common denominator (LCM)	● Understand the real number system and the real number line ● Identify the numbers that make up the set of rational and irrational numbers ● Express all rational numbers in m/n form ● Write rational numbers as terminating or repeating decimals using long division ● Understand the absolute values of rational numbers as a distance from zero ● Locate rational numbers on a number line ● Compare rational numbers using the real number line and absolute value ● Perform operations with positive and negative integers ● Apply order of operations with positive and negative integers ● Represent and solve real-world mathematical problems with positive and negative integers using all four operations

Suggested Resources/Technology Tools

-Math In Focus Resources Chapter 1: The Real Number System
-Math In Focus Resources Chapter 2: Rational Number Operations
-Textbooks, workbooks, and assessment aides
-Calculators when specified
-NJSLS Grade 7 Mathematics Performance Coach Workbook
-FACEing Math activity book
-Teacher-made materials (such as checklists, graphic organizers, class notes, etc.)
-Teacher Pay Teachers Resources: scavenger hunts, math-libs, task cards
-Google Classroom
-Online textbook resources
-Math in Focus Virtual Manipulatives
-NJSLA Practice Tests and Released Items
-Khan Academy

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

General Modifications for students struggling to learn:
Small group instruction within the classroom
Differentiation through content, process, product,and environment
Individual feedback and praise towards what is done correctly based upon effort, attitude and strategy.
Help students manage individual stressors for the student and plan alternate pathways for completion of assignments.

Special Education:
Modifications are determined by each student's Individual Education Plan. Examples include:

-Use concrete examples of concepts before teaching the abstract
-Reduce the number of concepts presented at one time
-Give additional presentations by varying the methods using repetition, simpler explanations, more examples and modeling
-Use of aids (calculator, computer, tape recorder, etc.)
-Frequently check on progress of independent work
-Provide study guides and copy of notes
-Provide repetition and practice

MLL: Modifications are determined by each student. Examples include:
- Provide students with notes, examples, tests, and quizzes in their primary language
- Monitor the student's comprehension of language used during instruction
- Give written directions to supplement verbal directions
- Frequently check on progress of independent work

504: Modifications are determined by each student's 504 plan. Examples include:
-Teacher will review, restate and repeat directions, as needed
-Frequently check on progress of independent work

Gifted and Talented - Extension Topics: Operations with Radicals (Rational and Irrational Numbers)

Career Readiness, Life Literacies, and Key Skills NJSLS

Please select all standards that apply to this unit of study:

Act as a responsible and contributing community members and employee
Attend to financial well-being
Consider the environmental, social and economic impacts of decisions
Demonstrate creativity and innovation
Utilize critical thinking to make sense of problems and persevere in solving them
Model integrity, ethical leadership and effective management
Plan education and career paths aligned to personal goals
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence

Suggestions on integrating these standards can be found at: https://www.nj.gov/education/standards/clicks

Unit 2

Algebra

Summary and Rationale

In Grade 6, students took concepts and skills they had with numerical expressions and applied them to basic algebraic expressions. In this unit, students extend them to more complex expressions. Students simplify, expand, and factor increasingly complex algebraic expressions. They create bar models and diagrams to help them visualize algebraic situations and use them to solve real-world problems. Students learn to identify equivalent equations. They solve multi-step equations with variables on both sides, including equations with parentheses, and they learn to solve real-world problems algebraically. After solving equations, students learn how to solve inequalities, graph the solution set of an inequality, and use inequalities to solve real-word problems.

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 8 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 6 weeks

Standards

Expressions and Equations	
7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
7.EE.B.4.a	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
7.EE.B.4.b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
Interdisciplinary Connections	
NJSLS ELA	

A.R.1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
A.R.7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
Next Generation Science Standards	
MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways the parts of a cell contribute to the function
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.1.8.CDM.3	Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each
9.1.8.CDM.4	Compare and contrast loan management strategies, including interest charges and total principal repayment costs.
9.1.8.CP.1	Compare prices for the same goods or services.
9.1.8.FP.6	Compare and contrast advertising messages to understand what they are trying to accomplish.
9.1.8.PB.4	Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g. teenager, young adult, family)
9.1.8.PB.6	Construct a budget to save for short-term, long term, and charitable goals.
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
9.4.8.TL 1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

Instructional Focus

Enduring Understandings:	**Essential Questions:**

• Algebraic expressions containing rational numbers and several variables can be simplified, expanded, or factored to write equivalent expressions. • Equivalent algebraic expressions are expressions that have the same value for any given value of the variable. • Fractions and decimals function the same as integers in algebraic expressions: They can be numerical terms and coefficients. The different types of numbers do not determine whether terms are like terms. • When solving equations by performing inverse operations on both sides, the revised equation is equivalent to the original equation. (Properties of Equality) • When solving equations, it is advisable to perform the order of operations "in reverse." However, the inverse operations can be performed in any order and the solution remains the same. • Equivalent equations are equations that have the same solution. • An inequality has a set of solutions that make it a true statement. The solution to an inequality can be graphed as a ray on a number line. • To solve inequalities, employ the same methods used to solve equations with one exception: The inequality symbol reverses every time both sides of the inequality are multiplied or divided by a negative number. • The solutions to equations and inequalities can be checked by substituting a solution back into the original. • Algebraic equations and inequalities can be used to model mathematical or real-world situations and to find values of variables.	• What is the difference between solving an equation and solving an inequality? • How can equations and inequalities be modeled?

Evidence of Learning (Assessments)

Ongoing observation
Class Participation
Classwork
Problem of the Day/Week
Guided Practice
Warm-ups/Exit Tickets
Homework

Quizzes/Tests
Benchmark Assessments

Objectives (SLO)

Students will know:	Students will be able to:
● Equivalent Equations ● Solution set ● Equivalent inequalities .	● Represent algebraic expressions using bar models. ● Simplify algebraic expressions with decimal and fractional coefficients by adding and subtracting like terms. ● Simplify algebraic expressions with more than two terms. ● Simplify algebraic expressions by using the commutative property of addition. ● Simplify algebraic expressions with two variables. ● Expand algebraic expressions involving fractions, decimals, and negative factors. ● Factor algebraic expressions with two variables. ● Factor algebraic expressions with negative terms. ● Translate verbal descriptions into algebraic expressions with one or more variables. ● Translate verbal descriptions into algebraic expressions with parentheses ● Solve real-world problems using algebraic reasoning. ● Identify equivalent equations. ● Solve algebraic equations with variables on the same side of the equation. ● Solve algebraic equations with variables on both sides of the equation. ● Solve algebraic equations in factored form. ● Solve algebraic inequalities. ● Graph the solution set of an inequality on a number line. ● Solve multi-step algebraic inequalities. ● Solve real-word problems using algebraic equations and inequalities.

Suggested Resources/Technology Tools

-Math In Focus Resources Chapter 3: Algebraic Expressions
-Math In Focus Resources Chapter 4: Algebraic Equations and Inequalities
-Textbooks, workbooks, and assessment aides
-NJSLS Grade 7 Mathematics Performance Coach Workbook
-FACEing Math activity book
-Teacher-made materials (such as checklists, graphic organizers, class notes, etc.)
-Teacher Pay Teachers Resources: scavenger hunts, math-libs, task cards
-Google Classroom

-Online textbook resources
-Math in Focus Virtual Manipulatives
-NJSLA Practice Tests and Released Items)
-Khan Academy

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

General Modifications for students struggling to learn:
Small group instruction within the classroom
Differentiation through content, process, product,and environment
Individual feedback and praise towards what is done correctly based upon effort, attitude and strategy.
Help students manage individual stressors for the student and plan alternate pathways for completion of assignments

Special Education:
Modifications are determined by each student's Individual Education Plan. Examples include:
-Use concrete examples of concepts before teaching the abstract
-Reduce the number of concepts presented at one time
-Give additional presentations by varying the methods using repetition, simpler explanations, more examples and modeling
-Use of aids (calculator, computer, tape recorder, etc.)
-Frequently check on progress of independent work
-Provide study guides and copy of notes
-Provide repetition and practice

MLL: Modifications are determined by each student. Examples include:
- Provide students with notes, examples, tests, and quizzes in their primary language
- Monitor the student's comprehension of language used during instruction
- Give written directions to supplement verbal directions
- Frequently check on progress of independent work

504: Modifications are determined by each student's 504 plan. Examples include:
-Teacher will review, restate and repeat directions, as needed
-Frequently check on progress of independent work

Gifted and Talented - Extension Topics: Using Algebra to Explore Successive Percentages and problems involving Combined Rates

Career Readiness, Life Literacies, and Key Skills NJSLS

Please select all standards that apply to this unit of study:

Act as a responsible and contributing community members and employee
Attend to financial well-being
Consider the environmental, social and economic impacts of decisions
Demonstrate creativity and innovation
Utilize critical thinking to make sense of problems and persevere in solving them
Model integrity, ethical leadership and effective management

Plan education and career paths aligned to personal goals
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence

Suggestions on integrating these standards can be found at: https://www.nj.gov/education/standards/clicks

Unit 3

Proportional Relationships

Summary and Rationale

In this unit, students extend their knowledge of ratios and rates to the concepts of direct and inverse proportion. They identify both direct and inverse proportion, recognize that a constant of proportionality can be a constant rate, and solve real-world proportional-relationship problems. Students use cross products to solve proportions. They use bar models to visualize, interpret, and solve direct and inverse proportion problems.

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 4 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 3 weeks

Standards

Ratios and Proportional Relationships	
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
7.RP.B.2.a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
7.RP.B.2.b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships
7.RP.B.2.c	Represent proportional relationships by equations.
7.RP.B.2.d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
7.RP.B.3	Use proportional relationships to solve multistep ratio and percent problems
Interdisciplinary Connections	
NJSLS ELA	

A.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
RL.8.1	Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.1.8.CDM.3	Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each
9.1.8.CDM.4	Compare and contrast loan management strategies, including interest charges and total principal repayment costs.
9.1.8.CP.1	Compare prices for the same goods or services.
9.1.8.FP.6	Compare and contrast advertising messages to understand what they are trying to accomplish.
9.1.8.PB.4	Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g. teenager, young adult, family)
9.1.8.PB.6	Construct a budget to save for short-term, long term, and charitable goals.
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
9.4.8.TL 1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
● Two quantities that are in a proportional relationship can be used to solve real-world and mathematical problems. ● A proportion is an equation that says two ratios are equivalent. The key to writing a proportion is making sure that all ratios in the proportion compare quantities in the same order.	● What is a proportion? ● How is a proportion solved?

- Cross products can be used to solve proportions.
- A direct proportion is a relationship between two quantities in which both quantities increase or decrease by the same factor. This factor is called the constant of proportionality.
- The graph of a direct proportion relationship is a straight line that passes through the origin, but does not lie along the x or y-axis.

Evidence of Learning (Assessments)

Ongoing observation
Class Participation
Classwork
Problem of the Day/Week
Guided Practice
Warm-ups/Exit Tickets
Homework
Quizzes/Tests
Benchmark Assessments

Objectives (SLO)

Students will know:

- Proportion
- Cross Products
- Direct proportion
- Constant of proportionality

.

Students will be able to:

- Identify a direct proportion.
- Recognize that a constant of proportionality can be a constant rate.
- Use a graph to interpret direct and inverse proportion.
- Solve real-world direct and inverse proportion problems

Suggested Resources/Technology Tools

-Math In Focus Resources Chapter 5: Direct and Inverse Proportions
-Textbooks, workbooks, and assessment aides
-NJSLS Grade 7 Mathematics Performance Coach Workbook
-FACEing Math activity book
-Teacher-made materials (such as checklists, graphic organizers, class notes, etc.)
-Teacher Pay Teachers Resources: scavenger hunts, math-libs, task cards
-Google Classroom
-Online textbook resources
-Math in Focus Virtual Manipulatives
-NJSLA Practice Tests and Released Items
-Khan Academy

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

General Modifications for students struggling to learn:
Small group instruction within the classroom
Differentiation through content, process, product,and environment
Individual feedback and praise towards what is done correctly based upon effort, attitude and strategy.
Help students manage individual stressors for the student and plan alternate pathways for completion of assignments

Special Education:
Modifications are determined by each student's Individual Education Plan. Examples include:
-Use concrete examples of concepts before teaching the abstract
-Reduce the number of concepts presented at one time
-Give additional presentations by varying the methods using repetition, simpler explanations, more examples and modeling
-Use of aids (calculator, computer, tape recorder, etc.)
-Frequently check on progress of independent work
-Provide study guides and copy of notes
-Provide repetition and practice

MLL: Modifications are determined by each student. Examples include:
- Provide students with notes, examples, tests, and quizzes in their primary language
- Monitor the student's comprehension of language used during instruction
- Give written directions to supplement verbal directions
- Frequently check on progress of independent work

504: Modifications are determined by each student's 504 plan. Examples include:
-Teacher will review, restate and repeat directions, as needed
-Frequently check on progress of independent work

Gifted and Talented - Extension Topic- Constant of Proportionality with Similar Figures and Scale Drawings, Further investigation of Inverse Variation

Career Readiness, Life Literacies, and Key Skills NJSLS

Please select all standards that apply to this unit of study:

Act as a responsible and contributing community members and employee
Attend to financial well-being
Consider the environmental, social and economic impacts of decisions
Demonstrate creativity and innovation
Utilize critical thinking to make sense of problems and persevere in solving them
Model integrity, ethical leadership and effective management
Plan education and career paths aligned to personal goals
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence

Suggestions on integrating these standards can be found at: https://www.nj.gov/education/standards/clicks

Unit 4

Geometry

Summary and Rationale

Two-Dimensional
In this unit, students explore and apply the properties of complementary angles, supplementary angles, adjacent angles, angles on a line, angles at a point, vertical angles, pairs of angles formed by parallel lines and a transversal, as well as interior and exterior angles of a triangle.

Students use algebra throughout the unit to solve geometric problems involving angle measures. As they apply and use angle sum properties, students write algebraic equations and solve them in order to identify unknown angle measures. When angle measures are related to a ratio, students use bar models and the unitary method to identify angle measures.

Students learn to construct angle bisectors and perpendicular bisectors, and also explore conditions that determine whether a triangle with a given set of dimensions is unique or not. The formal constructions they perform serve as an introduction to deductive reasoning skills they will further develop in later geometry courses.

Students also study scale drawings, learn to identify scale factors, and solve scale problems.

Three-Dimensional
Students identify cylinders, cones and pyramids, both as solids and from their nets. They also identify the shapes of certain cross sections of these solids. Students explore the concepts of surface area and volume of three-dimensional shapes including prisms, pyramids, cylinders and cones. They discover relationships between the volumes of prisms and cylinders, pyramids and cones to discover, justify, and apply surface area and volume formulas. Students also use the formulas to find volume and surface areas of three-dimensional composite shapes and solve real-world problems

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 5 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 4 weeks

Standards

Geometry	
7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
7.G.B.6	Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
Interdisciplinary Connections	
NJSLS ELA	
A.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
RL.8.1	Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Instructional Focus

Enduring Understandings:	**Essential Questions:**

The sum of the measures of angles on a line is 180°. The sum of the measures of angles at a point is 360°. Adjacent angles are two angles that share a common vertex and a side, but have no common interior points. Complementary angles are two angles whose angle measures total 90°. Supplementary angles are two angles whose angle measures total 180°. Two or more angles that have the same measure are congruent angles. Vertical angles are either pair of nonadjacent angles formed when two lines intersect. Vertical angles have equal measures. An interior angle of a triangle is an angle inside the triangle. An exterior angle of a triangle is formed by one side of a triangle and the extension of an adjacent side. A unique triangle refers to a triangle with a specific size and shape. It refers not to a single triangle, but to all triangles with the same size and shape. Similar figures are figures that are identical in shape, but not the same size. The side lengths of similar figures are proportional. Solids such as prisms, pyramids, cylinders, and cones are all around. Surface areas and volumes of these figures can be calculated to solve real-world problems. Volume is a measure of the space enclosed within a solid figure. Surface area is the sum of the areas of the faces and lateral surfaces of a solid figure. A cylinder is a solid with a curved surface and two parallel bases that are congruent circles.	What are adjacent angles? How is an exterior angle of a triangle formed? When a transversal intersects two parallel lines, how many and what kind of angles are formed? What are congruent figures? How are congruent figures different from similar figures? Where do we find solids around us? How is volume different from surface area? How is the net of a cone or a cylinder different from that of a pyramid or prism?

A cone is a solid with a circular base, a curved surface, and a vertex. A lateral surface is the curved surface of a cone or cylinder. The slant height of a cone is the distance from the vertex to any point on the edge of the base. A plane is a flat surface that extends infinitely in two dimensions. A plane intersecting a solid creates a cross section only if the plane passes through the interior of the solid. The slant height of a pyramid is the distance from the vertex to the midpoint of any edge of the base.	

Evidence of Learning (Assessments)

Ongoing observation
Class Participation
Classwork
Problem of the Day/Week
Guided Practice
Warm-ups/Exit Tickets
Homework
Quizzes/Tests
Benchmark Assessments

Objectives (SLO)

Students will know:	Students will be able to:
● Complementary/Supplementary angles ● Adjacent angles ● Vertical angles ● Congruent angles ● Transversal ● Equidistant ● Midpoint ● Included side, included angle ● Scale, scale factor ● Cylinder ● Cone	● Explore the properties of complementary angles and supplementary angles. ● Explore the properties of adjacent angles. ● Explore and apply the properties of angles at a point. ● Explore and apply the properties of vertical angles. ● Identify the types of angles formed by parallel lines and a transversal. ● Write and solve equations to find unknown angle measures in figures. ● Explore and apply the properties of the interior angles of a triangle. ● Explore and apply the properties of the exterior angles

● Lateral surface ● Slant height ● Plane ● Cross section ● Volume ● Surface area .	of a triangle. ● Construct a triangle with given measures. ● Determine whether a unique triangle, more than one triangle, or no triangle can be drawn from given side lengths. ● Construct a rectangle, square, rhombus, or parallelogram at a different scale ● Identify the scale factor in the diagram. ● Solve problems involving scale drawings of geometric figures ● Recognize cylinders and cones. ● Identify cross sections of solids. ● Find the volume and surface area of prisms, pyramids, cylinders, and cones. ● Solve real- world problems involving cylinders, cones, pyramids, spheres, and composite figures.

Suggested Resources/Technology Tools

-Math In Focus Resources Chapters 6-8
-Textbooks, workbooks, and assessment aides
-NJSLS Grade 7 Mathematics Performance Coach Workbook
-FACEing Math activity book
-Teacher-made materials (such as checklists, graphic organizers, class notes, etc.)
-Teacher Pay Teachers Resources: scavenger hunts, math-libs, task cards
-Google Classroom
-Online textbook resources
-Math in Focus Virtual Manipulatives
-NJSLA Practice Tests and Released Items
-Khan Academy

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

General Modifications for students struggling to learn:
Small group instruction within the classroom
Differentiation through content, process, product,and environment
Individual feedback and praise towards what is done correctly based upon effort, attitude and strategy.
Help students manage individual stressors for the student and plan alternate pathways for completion of assignments

Special Education:
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-Use concrete examples of concepts before teaching the abstract
-Reduce the number of concepts presented at one time
-Give additional presentations by varying the methods using repetition, simpler explanations, more examples and modeling
-Use of aids (calculator, computer, tape recorder, etc.)

-Frequently check on progress of independent work
-Provide study guides and copy of notes
-Provide repetition and practice

MLL: Modifications are determined by each student. Examples include:
- Provide students with notes, examples, tests, and quizzes in their primary language
- Monitor the student's comprehension of language used during instruction
- Give written directions to supplement verbal directions
- Frequently check on progress of independent work

504: Modifications are determined by each student's 504 plan. Examples include:
-Teacher will review, restate and repeat directions, as needed
-Frequently check on progress of independent work

Gifted and Talented - Extension Topic- Geometric Constructions, Area of Complex Regions, Volume of Complex Solids

Career Readiness, Life Literacies, and Key Skills NJSLS

Please select all standards that apply to this unit of study:

Act as a responsible and contributing community members and employee
Attend to financial well-being
Consider the environmental, social and economic impacts of decisions
Demonstrate creativity and innovation
Utilize critical thinking to make sense of problems and persevere in solving them
Model integrity, ethical leadership and effective management
Plan education and career paths aligned to personal goals
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence

Suggestions on integrating these standards can be found at: https://www.nj.gov/education/standards/clicks

Unit 5

Statistics

Summary and Rationale

In this unit, students learn to identify measures of variation. They divide a data set into quartiles and identify interquartile range. Students draw and interpret stem-and-leaf plots and box-and-whisker plots, and learn to find mean absolute deviation.

Students learn about population and samples. They apply different random sampling methods, use statistics from a sample to make inferences about a population, and use an inference to estimate a population mean. Students also make comparative inferences about two populations using two sets of sample statistics.

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 5 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 4 weeks

Standards

Statistics and Probability	
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

Interdisciplinary Connections

NJSLS ELA

A.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
RL.8.1	Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
MS-PS1-2 (Next Gen Sci)	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., 6.SP.B.5)
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
9.4.8.IML 3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b)
9.4.8.IML 4	Ask insightful questions to organize different types of data and create meaningful visualizations.
9.4.8.IML 5	Analyze and interpret local or public data sets to summarize and effectively communicate the data
9.4.8.TL 1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Measures of central tendency and measures of variation are used to draw conclusions about populations. The median divides a data set into two halves. The medians of the lower half and the upper half divide the set into equal fourths. The median of the lower half is the first quartile. The median of the set is the	What do stem-and-leaf plots emphasize about a data set? What do box-and-whisker plots emphasize about a data set? Why are random sampling methods used? How can you use measures of center/variability to compare two populations?

second quartile. The median of the upper half is the third quartile.

The interquartile range gives a good idea of the values that are typical of the data set. It describes the central 50% of the values in a data set and is the difference between the third quartile and the first quartile.

A stem-and-leaf plot displays data in a way that emphasizes the range of the data set. A box-and-whisker plot emphasizes the three quartiles, as well as the lower and upper extremes of the data.

The mean absolute deviation (MAD) is another useful measure of variation. It is the average of the distances of all the values in a set from the mean. This value gives a good sense of how tightly data in a set is clustered around the mean. The greater the MAD of a data set, the more spread out its values are from the mean.

When it is impossible or impractical to study an entire population, a sample population can be used to obtain data and draw conclusions. Such conclusions are called inferences, which are approximations, and not facts. The more representative of a population a sample is, the more likely it is that the sample data will be useful and valid.

To select a random and unbiased sample, every member of the population must have an equal chance of being selected and the selection of members is independent of each other. Three different random sampling methods are simple random sampling, stratified random sampling, and systematic random sampling.

Evidence of Learning (Assessments)

Ongoing observation
Class Participation
Classwork
Problem of the Day/Week
Guided Practice
Warm-ups/Exit Tickets
Homework
Quizzes/Tests

Benchmark Assessment

Objectives (SLO)

Students will know:	Students will be able to:
● Measure of variation ● Range ● First/second/third quartile ● Lower/upper quartile ● Interquartile range ● Stem-and-leaf plot ● Box plot ● Box-and-whisker plot ● 5-point summary ● Mean absolute deviation ● Population ● Sample, sample size, random sample ● Unbiased/biased sample ● Inference .	● Understand the concept of measures of variation. ● Understand and solve problems involving quartiles and interquartile range. ● Represent data in a stem-and-leaf plot. ● Make conclusions and solve word problems involving stem-and-leaf plots. ● Draw and interpret box plots. ● Understand mean absolute deviation. ● Solve problems involving box plots and mean absolute deviation. ● Understand the concept of a population and samples. ● Understand and apply different random sampling methods. ● Simulate random sampling. ● Make and use inferences about a population to estimate its population mean. ● Make comparative inferences about two populations.

Suggested Resources/Technology Tools

--Textbooks, workbooks, and assessment aides
-NJSLS Grade 7 Mathematics Performance Coach Workbook
-FACEing Math activity book
-Teacher-made materials (such as checklists, graphic organizers, class notes, etc.)
-Teacher Pay Teachers Resources: scavenger hunts, math-libs, task cards
-Google Classroom
-Online textbook resources
-Math in Focus Virtual Manipulatives
-NJSLA Practice Tests and Released Items
-Khan Academy

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

General Modifications for students struggling to learn:
Small group instruction within the classroom
Differentiation through content, process, product,and environment
Individual feedback and praise towards what is done correctly based upon effort, attitude and strategy.
Help students manage individual stressors for the student and plan alternate pathways for completion of assignments

Special Education:
Modifications are determined by each student's Individual Education Plan. Examples include:
-Use concrete examples of concepts before teaching the abstract
-Reduce the number of concepts presented at one time
-Give additional presentations by varying the methods using repetition, simpler explanations, more examples and modeling
-Use of aids (calculator, computer, tape recorder, etc.)
-Frequently check on progress of independent work
-Provide study guides and copy of notes
-Provide repetition and practice

MLL: Modifications are determined by each student. Examples include:
- Provide students with notes, examples, tests, and quizzes in their primary language
- Monitor the student's comprehension of language used during instruction
- Give written directions to supplement verbal directions
- Frequently check on progress of independent work

504: Modifications are determined by each student's 504 plan. Examples include:
-Teacher will review, restate and repeat directions, as needed
-Frequently check on progress of independent work

Gifted and Talented - Extension Topic-Scatter Plots- Identifying a linear model (Connect to units 2 and 3)

Career Readiness, Life Literacies, and Key Skills NJSLS

Please select all standards that apply to this unit of study:

- Act as a responsible and contributing community members and employee
- Attend to financial well-being
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation
- Utilize critical thinking to make sense of problems and persevere in solving them
- Model integrity, ethical leadership and effective management
- Plan education and career paths aligned to personal goals
- Use technology to enhance productivity increase collaboration and communicate effectively
- Work productively in teams while using cultural/global competence

Suggestions on integrating these standards can be found at: https://www.nj.gov/education/standards/clicks

Unit 6

Probability

Summary and Rationale

In this unit, students learn about chance processes, and measuring the likelihood of events. They learn to distinguish between theoretical and experimental probability and begin to recognize that as the number of trials increases in a n experiment with a chance process, the experimental probability measures tend to approach the values of theoretical probability measures.

Students will also learn to identify whether compound events are independent or dependent. They will apply the multiplication and addition probability rules to compute probabilities of compound events, both independent and dependent.

Recommended Pacing

For recommended specific pacing refer to the scope and sequence.
Approximately 5 weeks (this includes time for review, quizzes and tests)

- Accelerated Pre-Algebra should cover this unit is 4 weeks

Standards

Statistics and Probability	
7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability
7.SP.C.7.a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
7.SP.C.7.b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process

7.SP.C.8.a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
7.SP.C.8.b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
7.SP.C.8.c	Design and use a simulation to generate frequencies for compound events.
Interdisciplinary Connections	
NJSLS ELA	
A.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
RL.8.1	Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
Integration of Technology	
8.1.8.A.5	Select and use appropriate tools and digital resources to accomplish a variety of tasks and to solve problems.
Career Readiness, Life Literacies and Key Skills	
9.2.8.CAP.12	Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.
9.4.8.IML 3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b)
9.4.8.IML 4	Ask insightful questions to organize different types of data and create meaningful visualizations.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Some events are more likely than others. You can use probability to describe how likely an event is to occur. The probability of an event is represented by a rational number from 0 to 1.	What is probability? What are the differences between theoretical and experimental probability? How are they related?

The theoretical probability of an event is equal to the number of favorable outcomes to the event divided by the number of equally likely outcomes.

Mutually exclusive events are events that cannot both occur simultaneously.

The complement of an event consists of all the outcomes in a sample space that are not favorable to the event.

Experimental probability is based on the observed frequency of an event during a number of trials, or an experiment. As the number of trials increases, experimental probability tends to approach theoretical probability measures.

Probability distributions can be displayed in a table, bar graph, or histogram.

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Objectives (SLO)

Students will know:

- Outcomes
- Sample space
- Event
- Probability
- Fair, biased
- Venn diagram
- Mutually exclusive
- Complementary events, complement
- Relative frequency
- Observed frequency
- Experimental probability
- Theoretical probability

Students will be able to:

- Understand the concepts of outcomes, events, and sample space and apply them to everyday life.
- Find the probability of events.
- Use Venn diagrams to illustrate events and their relationships.
- Solve real-world problems involving probability.
- Find relative frequencies, interpret them as probabilities and use them to make predictions.
- Compare relative frequencies to theoretical probabilities.
- Understand and apply uniform probability models and non-uniform probability models

• Probability model • Probability distribution • Uniform probability model • Non-uniform probability model .	• Compare experimental probability with theoretical probability. • Understand and represent compound events • Understand independent and dependent events • Use the multiplication rule of probability to solve problems with independent and dependent events • Use the addition rule of probability to solve problems with independent and dependent events

Suggested Resources/Technology Tools

-Math In Focus Resources Course 2, Chapter 10:
-Math In Focus Resources Course 3, Chapter 11:
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-FACEing Math activity book
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Gifted and Talented - Extension Topics: Geometric Probability, Using Combinations and Permutations to Calculate Probabilities

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