Montague School District
Seventh Grade Pre Algebra Mathematics

Unit 1 Seventh Grade Pre Algebra Mathematics		
Pacing: 45 days		
Unit Title	**NJSLS**	**Unit Focus**
Unit 1 **Operations on Rational Numbers & Expressions**	⬛7.NS.A.1 ⬛7.NS.A.2 ⬛7.NS.A.3 ⬛7.EE.A.1 ⬛7.EE.A.2 ⚫8.NS.A.1 ⚫8.NS.A.2	• Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers • Use properties of operations to generate equivalent expressions
Content Standards	**Suggested Mathematical Practices**	**Critical Knowledge & Skills**
7.NS.A.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. 7.NS.A.1a. 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.1b. 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.	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): • Opposite quantities combine to make 0 (additive inverses). • $p + q$ is the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. • Subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$ • The product of two whole numbers is the total number of objects in a number of equal groups. Students are able to: • represent addition and subtraction on a horizontal number line. • represent addition and subtraction on a vertical number line. • interpret sums of rational numbers in real-world situations. • show that the distance between two rational numbers on the number line is the absolute value of their difference. Learning Goal 1: Describe real-world situations in which (positive and negative) rational numbers are combined, emphasizing rational numbers that combine to make 0. Represent sums of rational numbers $(p + q)$ on horizontal and vertical number lines, showing that the distance along the number line is $\|q\|$ and including situations in which q is negative and positive.

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7.NS.A.1c. 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.1d. Apply properties of operations as strategies to add and subtract rational numbers.		Learning Goal 2: Add and subtract (positive and negative) rational numbers, showing that the distance between two points on a number line is the absolute value of their difference and representing subtraction using an additive inverse.
7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.A.2a. 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.2b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. 2c. Interpret quotients of rational	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	Concept(s): ● Every quotient of integers (with non-zero divisor) is a rational number. ● Decimal form of a rational number terminates in 0s or eventually repeats. ● Integers can be divided, provided that the divisor is not zero. ● If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Students are able to: ● multiply and divide signed numbers. ● use long division to convert a rational number to a decimal. Learning Goal 3: Multiply and divide signed numbers, including rational numbers, and interpret the products and quotients using real-world contexts. Learning Goal 4: Convert a rational number to a decimal using long division and explain why the decimal is either a terminating or repeating decimal.

Key: ⬛Major Content ⚫ Supporting Content ⊚Additional Content

numbers by describing real world contexts. 7.NS.A.2d. 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. 7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.A.2c. Apply properties of operations as strategies to multiply and divide rational numbers.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.	Concept(s): ● The process for multiplying and dividing fractions extends to multiplying and dividing rational numbers. Students are able to: ● add and subtract rational numbers. ● multiply and divide rational numbers using the properties of operations. ● apply the convention of order of operations to add, subtract, multiply and divide rational numbers. ● solve real world problems involving the four operations with rational numbers. Learning Goal 5: Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers. Learning Goal 6: Solve mathematical and real-world problems involving addition, subtraction, multiplication, and division of signed rational numbers.
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. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	Concept(s): ● Rewriting an expression in different forms in a problem context can shed light on the problem. Students are able to: ● add and subtract linear expressions having rational coefficients, using properties of operations. ● factor and expand linear expressions having rational coefficients, using properties of operations. ● write expressions in equivalent forms to shed light on the problem and interpret the relationship between the quantities in the context of the problem.

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		Learning Goal 7: Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. Learning Goal 8: Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.
8.NS.A.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	MP. 2 Reason abstractly and quantitatively.	Concept(s): ● Numbers that are not rational are irrational. ● Every number has a decimal expansion. Students are able to: ● compare decimal expansions of rational and irrational numbers. ● represent a rational number with its decimal expansion, showing that it repeats eventually. ● convert a decimal expansion (which repeats eventually) into a rational number. Learning Goal 9: Represent a rational number with its decimal expansion, showing that it eventually repeats, and convert such decimal expansions into rational numbers.
8.NS.A.2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., p^2). *For example, by truncating the decimal expansion of Ö2, show that Ö2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	MP.1 Make sense of problems and persevere in solving them. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): ● Rational approximation of irrational numbers Students are able to: ● compare irrational numbers by replacing each with its rational approximation. ● locate rational approximations on a number line. ● estimate the value of expressions containing irrational numbers. Learning Goal 10: Use rational numbers to approximate irrational numbers, locate irrational numbers on a number line, and estimate the value of expressions containing irrational numbers.

Unit 1 Seventh Grade Pre Algebra Mathematics
Formative, Alternate, Benchmark and Summative Assessments Study Island CPM checkups Quizzes Math Fluency Assessments

Key: ⬛Major Content ⚫ Supporting Content ⊚Additional Content

Tests Pair and Share Benchmarks Performance Assessments Bridges Post Assessments Observations Exit and Entrance Tickets Self Evaluations	
Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk Learners	**Integration of NJSLS 21st Century Skills, Life and Career Standards 9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness**
https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing	iPads Google Classroom https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing
Interdisciplinary Connections ELA, STEM, Science, Visual and Performing Arts	**Core instructional and supplemental materials**
NSLS Technology: https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing	CPM Mathematics Study Island by Edmentum 7.NS.A.1 Comparing Freezing Points 7.NS.A.1b-c Differences of Integers 7.NS.A.2 Why is a Negative Times a Negative Always Positive 7.NS.A.2d Equivalent fractions approach to non-repeating decimals 7.NS.A.2d Repeating decimal as approximation 7.EE.A.1 Writing Expressions 7.EE.A.2 Ticket to Ride 8.NS.A.1 Converting Decimal Representations of Rational Numbers to Fraction Representations

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Unit 2 Seventh Grade Pre Algebra Mathematics		
Pacing: 45 days		
Unit Title	**NJSLS**	**Unit Focus**
Unit 2 **Equations and Ratio & Proportion**	⬛7.EE.B.3 ⬛7.EE.B.4 ⬛7.RP.A.1 ⬛7.RP.A.2 ⬛7.RP.A.3 ◎7.G.A.1 ⬛8.EE.B.5	• Solve real-life and mathematical problems using numerical and algebraic expressions and equations • Analyze proportional relationships and use them to solve real-world and mathematical problems • Draw, construct, and describe geometrical figures and describe the relationships between them
Content Standards	**Suggested Mathematical Practices**	**Critical Knowledge & Skills**
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. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.	Concept(s): • Rational numbers can take different forms. Students are able to: • solve multi-step real-life problems using rational numbers in any form. • solve multi-step mathematical problems using rational numbers in any form. • convert between decimals and fractions and apply properties of operations when calculating with rational numbers. • estimate to determine the reasonableness of answers. Learning Goal 1: Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.

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7.EE.B.4. 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 . 7.EE.B.4a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* 7.EE.B.4b. Solve wordproblems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● compare an arithmetic solution to a word problem to the algebraic solution of the word problem, identifying the sequence of operations in each solution. ● write an equation of the form px + q = r or p(x + q)=r in order to solve a word problem. ● fluently solve equations of the form px + q = r and p(x + q)= r. ● write an inequality of the form $px + q > r$, $px + q < r$, $px + q \geq r$ or $px + q \leq r$ to solve a word problem. ● graph the solution set of the inequality. ● interpret the solution to an inequality in the context of the problem. Learning Goal 2: Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems. Learning Goal 3: Fluently solve equations; solve inequalities, graph the solution set of the inequality and interpret the solutions in the context of the problem (*Equations of the form $px + q = r$ and $p(x + q) = r$ and inequalities of the form $px + q > r$, $px + q \geq r$, $px + q \leq r$, or $px + q < r$, where p, q, and r are specific rational numbers).*

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

make, and describe the solutions. *(benchmarked)		
7.RP.A.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction* $\frac{1/2}{1/4}$ *mph, equivalently 2 mph.*	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision.	Concept(s): No new concept(s) introduced Students are able to: ● compute unit rates with ratios of fractions. ● compute unit rates with ratios of fractions representing measurement quantities. in both like and different units of measure. Learning Goal 4: Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units.
7.RP.A.2. Recognize and represent proportional relationships between quantities. 7.RP.A.2a. 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.A.2b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.A.2c. Represent proportional relationships by equations.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Proportions represent equality between two ratios. ● Constant of proportionality Students are able to: ● use tables and graphs to determine if two quantities are in a proportional relationship. ● identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. ● write equations representing proportional relationships. ● Interpret the origin and (1, r) on the graph of a proportional relationship in context. ● interpret a point on the graph of a proportional relationship in context. Learning Goal 5: Determine if a proportional relationship exists between two quantities e.g. by testing for equivalent ratios in a table or graph on the coordinate plane and observing whether the graph is a straight line through the origin. Learning Goal 6: Identify the constant of proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions.

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. 7.RP.A.2d. 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.		Learning Goal 7: Write equations to model proportional relationships in real world problems. Learning Goal 8: Use the graph of a proportional relationship to interpret the meaning of any point (x, y) on the graph in terms of the situation - including the points (0, 0) and (1, r), recognizing that r is the unit rate.
7.RP.A.3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Recognize percent as a ratio indicating the quantity *per one hundred*. Students are able to: ● use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error. ● use proportions to solve multistep ratio problems. Learning Goal 9: Solve multi-step ratio and percent problems using proportional relationships (*simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error)*
7.RP.A.3: Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): ● Scale and proportion Students are able to: ● use ratios and proportions to create scale drawings. ● reproduce a scale drawing at a different scale. ● computing actual lengths and areas from a scale drawing.

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

and commissions, fees, percent increase and decrease, percent error. 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.	MP.6 Attend to precision. MP.7 Look for and make use of structure.	• solve problems involving scale drawings using proportions. Learning Goal 10: Use ratio and proportion to solve problems involving scale drawings of geometric figures.
8.EE.B.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed*	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning	Concept(s): • Quantitative relationships can be represented in different ways. Students are able to: • graph proportional relationships. • interpret unit rate as the slope of a graph. • compare two different proportional relationships that are represented indifferent ways (table of values, equation, graph, verbal description). Learning Goal 11: Graph proportional relationships, interpreting slope as unit rate, and compare two proportional relationships, each represented in different ways.

Unit 2 Seventh Grade Pre Algebra Mathematics	
Formative, Alternate, Benchmark and Summative Assessments Study Island CPM checkups Quizzes Math Fluency Assessments Tests Pair and Share Benchmarks Performance Assessments Bridges Post Assessments Observations Exit and Entrance Tickets Self Evaluations	
Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk Learners	**Integration of NJSLS 21st Century Skills, Life and Career Standards 9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness**
https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing	iPads Google Classroom

Key: ⬛Major Content ⚫ Supporting Content ◎Additional Content

	https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing
Interdisciplinary Connections ELA, STEM, Science, Visual and Performing Arts	**Core instructional and supplemental materials**
NSLS Technology: https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing	CPM Mathematics Study Island by Edmentum 7.EE.B.3 Shrinking 7.EE.B.4 Fishing Adventures 2 7.EE.B.4, 7.NS.A.1 Bookstore Account 7.EE.B.4b Sports Equipment Set 7.RP.A.1 Cooking with the Whole Cup 7.RP.A.2 Sore Throats, Variation 1 7.RP.A.2 Buying Coffee 7.RP.A.2c Gym Membership Plans 7.G.A.1 Floor Plan 7.G.A.1 Map distance 8.EE.B.5 Who Has the Best Job?

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

Unit 3 First Grade		
Pacing: 45 days		
Unit Title	**NJSLS**	**Unit Focus**
Linear Equations, and Solutions	⬛**8.EE.A.1** ⬛**8.EE.A.2** ⬛**8.EE.A.3** ⬛**8.EE.A.4** ⬛**8.EE.C.7**	● **Work with radical and integer exponents** ● **Know that there are numbers that are not rational, and approximate them by rational numbers** ● **Understand the connections between proportional relationships, lines, and linear equations** ● **Analyze and solve linear equations and simultaneous linear equations**
Content Standards	**Suggested Mathematical Practices**	**Critical Knowledge & Skills**
8.EE.A.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Exponents as simplified representation of repeated multiplication. Students are able to: ● apply properties of exponents to numerical expressions. ● generate equivalent numerical expressions using positive and negative integer exponents. Learning Goal 1: Apply the properties of integer exponents to write equivalent numerical expressions
8.EE.A.2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that Ö2 is irrational.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Square root and cube roots; perfect squares and perfect cubes ● Inverse relationship between powers and square roots Students are able to: ● give the value of square roots of small perfect squares. ● solve equations of the form $x^2 = p$, where p is a positive rational number. ● use the square root symbol to represent solutions to equations of the form $x^2 = p$. ● give the value of cube roots of small perfect cubes. ● solve equations of the form $x^3 = p$, where p is a positive rational number. ● use the cube root symbol to represent solutions to equations of the form $x^3 = p$.

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

		• show or explain that Ö2 is an irrational number. • use volume formulas to find a single unknown dimension of cones, cylinders and spheres when solving real world problems. Learning Goal 2: Evaluate square roots and cubic roots of small perfect squares and cubes respectively and use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ where p is a positive rational number; identify √2 as irrational. Learning Goal 3: Apply the formula for the volume of a cone, a cylinder, or a sphere to find a single unknown dimension when solving real-world and mathematical problems.
8.EE.A.3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger.*	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): • Very large and very small quantities can be approximated with numbers expressed in the form of a single digit times an integer power of 10. Students are able to: • estimate very large and very small quantities with numbers expressed in the form of a single digit times an integer power of 10. • compare numbers written in the form of a single digit times an integer power of 10 and express how many times as much one is than the other. Learning Goal 4: Estimate and express the values of very large or very small numbers with numbers expressed in the form of a single digit times an integer power of 10. Compare numbers expressed in this form, expressing how many times larger or smaller one is than the other.
8.EE.A.4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	MP. 2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): No new concept(s) introduced Students are able to: • multiply and divide numbers expressed in scientific notation, including problems in which one number is in decimal form and one is in scientific notation. • add and subtract numbers expressed in scientific notation, including problems in which one number is in decimal form and one is in scientific notation. • use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.

Key: ⬛Major Content ⚫ Supporting Content ◎Additional Content

		• interpret scientific notation that has been generated by technology (e.g. recognize 4.1E-2 and 4.1e-2 as 4.1 x 10^{-2}). Learning Goal 5: Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used. In real-world problem-solving situations, choose units of appropriate size for measurement of very small and very large quantities and interpret scientific notation generated when technology has been used for calculations.
8.EE.C.7. Solve linear equations in one variable. 8EE.C.7a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). 8.EE.C.7b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	MP.5 Use appropriate tools strategically. MP.6 Attend to precision.	Concept(s): • Linear equations may have an infinite number of solutions. • Linear equations may have no solution or a single solution. Students are able to: • give examples of linear equations in one variable with one solution *($x = a$),* infinitely many solutions *($a = a$),* or no solutions *($a = b$.)* • transform a given equation, using the properties of equality, into simpler forms. • transform a given equation until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results *(a and b are different numbers).* • solve linear equations that have fractional coefficients; include equations requiring use of the distributive property and collecting like terms. Learning Goal 6: Apply the distributive property and collect like terms to solve linear equations in one variable that contain rational numbers as coefficients. Use an equivalent equation of the form $x = a$, $a = a$, or $a = b$ (where a and b are different numbers) to describe the number of solutions.

Unit 3 First Grade
Formative, Alternate, Benchmark and Summative Assessments Study Island CPM checkups Quizzes Math Fluency Assessments Tests Pair and Share Benchmarks Performance Assessments Bridges Post Assessments Observations Exit and Entrance Tickets Self Evaluations

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Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk Learners	**Integration of NJSLS 21st Century Skills, Life and Career Standards 9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness**
https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing	iPads Google Classroom https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing
Interdisciplinary Connections ELA, STEM, Science, Visual and Performing Arts	**Core instructional and supplemental materials**
NSLS Technology: https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing	CPM Mathematics Study Island by Edmentum 8.EE.A.1 Extending the Definitions of Exponents 8.G.C.9 A Canister of Tennis Balls 8.EE.A.3 Ant and Elephant 8.EE.A.4 Giantburgers 8.EE.C.7 The Sign of Solutions 8.EE.C.7 Coupon versus discount

Unit 4 Seventh Grade Pre Algebra Mathematics		
Pacing: 45 days		
Unit Title	**NJSLS**	**Unit Focus**
Unit 4 **Drawing Inferences about Populations & Probability Models**	⚫7.SP.A.1 ⚫7.SP.A.2 ◎7.SP.B.3 ◎7.SP.B.4 ⚫7.SP.C.5 ⚫7.SP.C.6 ⚫7.SP.C.7 ⚫7.SP.C.8	• Use random sampling to draw inferences about a population • Draw informal comparative inferences about two populations • Investigate chance processes and develop, use, and evaluate probability models
Content Standards	**Suggested Mathematical Practices**	**Critical Knowledge & Skills**
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	MP.3 Construct viable arguments & critique the reasoning of others.	Concept(s) • Statistics can be used to gain information about a population by examining a sample of the population.

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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.	MP.6 Attend to precision.	• Generalizations about a population from a sample are valid only if the sample is representative of that population. • Random sampling tends to produce representative samples. Students are able to: • analyze and distinguish between representative and non-representative samples of a population. Learning Goal 1: Distinguish between representative and non-representative samples of a population (*e.g. if the class had 50% girls and the sample had 10% girls, then that sample was not representative of the population*).
7.SP.A.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be*.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.6 Attend to precision.	Concept(s): • Inferences can be drawn from random sampling. Students are able to: • analyze data from a sample to draw inferences about the population. • generate multiple random samples of the same size. • analyze the variation in multiple random samples of the same size. Learning Goal 2: Use random sampling to produce a representative sample. Learning Goal 3: Develop inferences about a population using data from a random sample and assess the variation in estimates after generating multiple samples of the same size.
7.SP.B.3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot*	MP.3 Construct viable arguments & critique the reasoning of others. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics.	Concept(s): No new concepts introduced Students are able to: • locate, approximately, the measure of center (mean or median) of a distribution • visually assess, given a distribution, the measure of spread (mean absolute deviation or inter-quartile range). • visually compare two numerical data distributions and describe the degree of overlap. • measure or approximate the difference between the measures centers and express it as a multiple of a measure of variability.

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plot, the separation between the two distributions of heights is noticeable.	MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Learning Goal 4: Visually compare the means of two distributions that have similar variability; express the difference between the centers 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. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book*.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.	Concept(s): No new concept(s) introduced Students are able to: ● using measures of center, draw informal inferences about two populations and compare the inferences. ● using measures of variability, draw informal inferences about two populations and compare the inferences. Learning Goal 5: Draw informal comparative inferences about two populations using their measures of center and measures of variability.
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.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Probability of a chance event is a number between 0 and 1. ● Probability expresses the likelihood of the event occurring. ● Larger probability indicates greater likelihood. Students are able to: ● draw conclusions about the likelihood of events given their probability. Learning Goal 6: Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event happening is near 0, a likely event is near 1, and 1/2 is neither likely nor unlikely.
7.SP.C.6. Approximate the probability of a chance event by collecting data on the chance process that produces it and	MP.2 Reason abstractly and quantitatively.	Concept(s): ● Relative frequency ● Experimental probability

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observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	MP.1 Make sense of problems and persevere in solving them. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	● Theoretical probability Students are able to: ● collect data on chance processes, noting the long-run relative frequency. ● predict the approximate relative frequency given the theoretical probability. Learning Goal 7: Approximate the probability of a chance event by collecting data and observing long-run relative frequency; predict the approximate relative frequency given the probability
7.SP.C.7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. 7.SP.C.7a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected*. 7.SP.C.7b. . Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision.	Concept(s): ● Uniform (equally likely) and non-uniform probability models *Students are able to:* ● develop a uniform probability model. ● use a uniform probability model to determine the probabilities of events. ● develop (non-uniform) probability models by observing frequencies in data that has been generated from a chance process. Learning Goal 8: Develop a uniform probability model by assigning equal probability to all outcomes; develop probability models by observing frequencies and use the models to determine probabilities of events; compare probabilities from a model to observed frequencies and explain sources of discrepancy when agreement is not good

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land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?		
7.SP.C.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.C.8a. 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.8b. 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.8c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space. Students are able to: ● use organized lists, tables, and tree diagrams to represent sample spaces. ● given a description of an event using everyday language, identify the outcomes in a sample space that make up the described event. ● design simulations. ● use designed simulations to generate frequencies for compound events. Learning Goal 9: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams, identifying the outcomes in the sample space which compose the event. Use the sample space to find the probability of a compound event. Learning Goal 10: Design and use a simulation to generate frequencies for compound events.

Formative, Alternate, Benchmark and Summative Assessments Study Island CPM checkups Quizzes Math Fluency Assessments Tests Pair and Share Benchmarks Performance Assessments Bridges Post Assessments Observations Exit and Entrance Tickets Self Evaluations

Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk Learners	**Integration of NJSLS 21st Century Skills, Life and Career Standards 9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness**
https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing	iPads Google Classroom https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing
Interdisciplinary Connections ELA, STEM, Science, Visual and Performing Arts	**Core instructional and supplemental materials**
NSLS Technology: https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing	CPM Mathematics Study Island by Edmentum 7.SP.A.1 Mr. Briggs Class Likes Math 7.SP.A.2 Valentine Marbles 7.SP.B.3,4 College Athletes 7.SP.B.3,4 Offensive Linemen 7.SP.C.6 Heads or Tails 7.SP.C.7, 6 Rolling Dice 7.SP.C.7a How Many Buttons 7.SP.C.8 Tetrahedral Dice 7.SP.C.8 Waiting Times

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Unit 5 Seventh Grade Pre Algebra Mathematics		
Pacing: 45 days		
Unit Title	**NJSLS**	**Unit Focus**
Unit 5 **Problem Solving with Geometry**	◎7.G.B.4 ◎7.G.B.5 ◎7.G.B.6 ◎7.G.A.2 ◎7.G.A.3 ⚫7.EE.B.4 ⚫7.RP.A.3 ⚫8.EE.B.6 ⬛8.G.A.1 ⬛8.G.A.2 ⬛8.G.A.3 ⬛8.G.A.4 ⬛8.G.A.5 ◎8.G.C..9	• Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. • Draw, construct, and describe geometrical figures and describe the relationships between them. • Solve real-life and mathematical problems using numerical and algebraic expressions and equations
Content Standards	**Suggested Mathematical Practices**	**Critical Knowledge & Skills**
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.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): • Circumference Students are able to: • solve problems by finding the area and circumference of circles. • show that the area of a circle can be derived from the circumference. Learning Goal 1: 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.

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	MP.8 Look for and express regularity in repeated reasoning.	
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.EE.B.4. 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. 7.EE.B.4a. 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.	MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations. ● solve mathematical problems by writing and solving simple algebraic equations based on the relationships between and properties of angles (supplementary, complementary, vertical, and adjacent. Learning Goal 2: Write and solve *simple* multi-step algebraic equations involving supplementary, complementary, vertical, and adjacent angles.
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.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● solve real-world and mathematical problems involving area of two dimensional objects composed of triangles, quadrilaterals, and polygons. ● solve real-world and mathematical problems involving volume of three dimensional objects composed of cubes and right prisms. ● solve real-world and mathematical problems involving surface area of three-dimensional objects composed of cubes and right prisms. Learning Goal 3: 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.

Key: ⬛Major Content ⚫ Supporting Content ◎Additional Content

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	MP.3 Construct viable arguments & critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Conditions for unique triangles, more than one triangle, and no triangle. Students are able to: ● draw geometric shapes with given conditions, including constructing triangles from three measures of angles or sides. ● recognize conditions determining a unique triangle, more than one triangle, or no triangle. Learning Goal 4: Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles.
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.	MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Cross-sections of three-dimensional objects Students are able to: ● analyze three dimensional shapes (right rectangular pyramids and prisms) by examining and describing all of the 2-dimensional figures that result from slicing it at various angles. Learning Goal 5: Describe all of the 2-dimensional figures that result when a 3-dimemsional figures are sliced from multiple angles.
7.EE.B.4. 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. 7.EE.B.4a. 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.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● write an equation of the form px + q = r or p(x + q)=r in order to solve a word problem. ● fluently solve equations of the form px + q = r and p(x + q)= r. Learning Goal 6: Fluently solve simple equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers.

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Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*		
7.RP.A.3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Recognize percent as a ratio indicating the quantity *per one hundred.* Students are able to: ● use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error. ● use proportions to solve multistep ratio problems. Learning Goal 7: Solve multi-step ratio and percent problems using proportional relationships (*simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error).*
8.EE.B.6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students are able to: ● show, using similar triangles, and explain why the slope, m, is the same between any two distinct points on a non-vertical line. ● derive, from two points, the equation $y = mx$ for a line through the origin. ● derive, from two points, the equation $y = mx + b$ for a line intercepting the vertical axis at b. Learning Goal 8: Derive the equation of a line ($y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b) and use similar triangles to explain why the slope (m) is the same between any two points on a non-vertical line in the coordinate plane.

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	MP.8 Look for and express regularity in repeated reasoning.	
8.G.A.1. Verify experimentally the properties of rotations, reflections, and translations: 8.G.A.1a. Lines are transformed to lines, and line segments to line segments of the same length. 8.G.A.1b. Angles are transformed to angles of the same measure. 8.G.A.1c. Parallel lines are transformed to parallel lines.	MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● A property of rigid motion transformations (rotation, reflection, and translation) is that the measure of a two-dimensional object under the transformation remains unchanged. Students are able to: ● show and explain that performing rotations, reflections, and translations on lines results in a line. ● show and explain that performing rotations, reflections, and translations on line segments results in a line segment and does not alter the length of the line segment. ● show and explain that performing rotations, reflections, and translations on angles results in an angle and does not alter the measure of the angle. ● show and explain that performing rotations, reflections, and translations on parallel lines results in parallel lines. ● explain that a property of rigid motion transformations (rotation, reflection, and translation) is that the measure of a two-dimensional object under the transformation remains unchanged. Learning Goal 9: Explain and model the properties of rotations, reflections, and translations with physical representations and/or geometry software using pre-images and resultant images of lines, line segments, and angles.
8.G.A.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	Concept(s): ● A two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Students are able to: ● given two congruent figures, describe a transformation or sequence of transformations that shows the congruence between them. Learning Goal 10: Describe and perform a sequence of rotations, reflections, and/or translations on a two dimensional figure in order to prove that two figures are congruent.

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8.G.A.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning. of others. MP.5 Use appropriate tools strategically.	Concept(s): No new concept(s) introduced Students are able to: ● describe, using coordinates, the resulting two-dimensional figure after applying dilations with scale factor greater than, less than, and equal to 1. ● describe, using coordinates, the resulting two-dimensional figure after applying translation, rotation, and reflection. Learning Goal 11: Use the coordinate plane to locate images or pre-images of two-dimensional figures and determine the coordinates of a resultant image after applying dilations, rotations, reflections, and translations.
8.G.A.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	Concept(s): ● A two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. ● Congruent figures are also similar. Students are able to: ● describe a transformation or sequence of transformations that show the similarity between them given two similar two-dimensional figures. Learning Goal 12: Apply an effective sequence of transformations to determine that figures are similar when corresponding angles are congruent and corresponding sides are proportional. Write similarity statements based on such transformations.
8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of*	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning. of others.	Concept(s): No new concept(s) introduced Students are able to: ● give informal arguments to establish facts about the angle sum of triangles ● give informal arguments to establish facts about exterior angles of triangles. ● give informal arguments to establish facts about the angles created when parallel lines are cut by a transversal. ● give informal arguments to establish the angle-angle criterion for similarity of triangles.

Key: ⬛Major Content ⚫ Supporting Content ⊙Additional Content

the three angles appears to form a line, and give an argument in terms of transversals why this is so.		Learning Goal 13: Give informal arguments to justify facts about the exterior angles of a triangle, the sum of the measures of the interior angles of a triangle, the angle-angle relationship used to determine similar triangles, and the angles created when parallel lines are cut by a transversal.
8.G.C.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Apply formulas to find the volume of cones, cylinders and spheres in real world problems Students are able to: ● use volume formulas to find a single unknown dimension of cones, cylinders and spheres when solving real world problems. Learning Goal 14:: Apply the formula for the volume of a cone, a cylinder, or a sphere to find a single unknown dimension when solving real-world and mathematical problems.

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Accommodations & modifications for special education, ELL,G&T, 504 plans and At Risk Learners	**Integration of NJSLS 21st Century Skills, Life and Career Standards 9.1 CRP, 9.2 Financial Literacy, and 9.3 Career Awareness**
https://docs.google.com/document/d/1QOotX2EIuJaPydBBcm-l6_Jo6n-j0uEqI3YX0q3MDVM/edit?usp=sharing	iPads Google Classroom https://docs.google.com/document/d/1sBiARk7yaPV_NQhMh5cJJ_wJb0Rj9nEUvxJKsE-8xvw/edit?usp=sharing

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Interdisciplinary Connections ELA, STEM, Science, Visual and Performing Arts	**Core instructional and supplemental materials**
NSLS Technology: https://docs.google.com/document/d/1GHL_TdtZh2bmZbeyCW5BPMWOvY-2o5P7NLU_3bDo1qE/edit?usp=sharing	CPM Mathematics Study Island by Edmentum 7.G.B.4 Wedges of a Circle 7.G.B.4 Eight Circles 7.G.B.6, 7.RP.A.3 Sand under the Swing Set 7.G.A.2 A task related to 7.G.A.2 7.G.A.3 Cube Ninjas! 7.RP, 7.EE, 7.NS Drill Rig 7.RP.A.3, 7.EE.B.3,4 Gotham City Taxis 8.EE.B.6 Slopes Between Points on a Line 8.G.A.1 Reflections, Rotations, and Translations 8.G.A.2 Congruent Triangles 8.G.A.3 Effects of Dilations on Length, Area, and Angles 8.G.A.4 Are They Similar 8.G.A.5 Street Intersections 8.G.A.5 Similar Triangles II 8.G.A.5 Triangle's Interior Angles 8.G.C.9 A Canister of Tennis Balls

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