Mathematics: Pre-Algebra Eight

Students in 8th Grade Pre-Algebra will study expressions and equations using one or two unknown values. Students will be introduced to the concept of a mathematical function and use functions to describe relationships between quantities. A function is a special relationship in math where a value converts to one value and only one value.

The study of expressions and equations will include rational numbers and irrational ($\sqrt{2}$) numbers. Additionally, students will use equations to model and solve problems.

The study of figures will include the special properties of right triangles, the volume of cylinders, cones and spheres and the movement of similar shapes in coordinate geometry. Students will analyze two- and three-dimensional figures using distance, angles and congruence.

After successful completion of this course, students will be eligible to take Algebra 1.

Unit 1 – The Number System

At the end of this unit, students should be able to answer "How can mathematical ideas be represented?"

Students will know that there are numbers that are not rational, and be able to approximate them by rational numbers. Students will know that numbers that are not rational are called irrational. They should informally understand that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert decimal expansion which repeats eventually into a rational number.

Students will be able 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.

Content: Identifying and using Rational Numbers   **Duration:** August (3 days)

Essential Question(s):	How is mathematics used to quantify, compare, represent and model numbers? What is a rational number? When is it best to use a fraction? …a decimal? …a percent?
Skills:	• Determine whether a number is rational. Show that the decimal expansion of a rational number terminates or repeats (limit repeating decimals to thousandths). • Convert a terminating or repeating decimal to a rational number (limit repeating decimals to thousandths).
Instructional/Engagement Activities	
Assessment:	• Are the following numbers rational? $\left\{ \begin{array}{l} 2, 0, -3, \frac{3}{4}, -\frac{4}{5}, 0.125, \\ -0.5, 0.\overline{3}, \sqrt{2}, \pi \end{array} \right\}$ • Write 5/6 as a decimal. • Write 0.125 as a fraction
Resources:	Mathematics Course 3, Glencoe , pg 7

Standards:	CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties.
	
	Anchor: M08.A-N.1.1 – Apply concepts of rational and irrational numbers
	
	Eligible Content: M08.A-N.1.1.1 – Determine whether a number is rational
	                                          or irrational. For rational numbers, show
	                                          that the decimal expansion
	terminates or
	                                          repeats.
	                            M08.A-N.1.1.2 – Convert a terminating or repeating
	                                          decimal to a rational number.

Vocabulary:	Unit Rate, ratio, percent, decimal, fraction, rational number, repeating decimal, terminating decimal

Comments: Chapter 1, Lesson 1

Content: Powers and Exponents   **Duration:** August (2 Days)

Essential Question:	Why is it helpful to write numbers in different ways?
Skills:	• Write expressions involving powers and exponents • Evaluate expressions involving powers and exponents
Instructional/Engagement Activities	
Assessment:	• Write $3 \cdot p \cdot p \cdot p \cdot 3$ using exponents • Evaluate $(c^3 + d^4)^2 - (c + d)^3$, if c = -2 and d = 3 • A cube has a length of 6 in. What is the volume of the cube expressed as a power?
Resources:	Mathematics Course 3, Glencoe, pgs 15 - 22
Standards:	CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions. Anchor: M08.B-E.1.1 – Represent and use expressions and equations to solve Problems involving radicals and integer exponents. Eligible Content: M08.B-E.1.1.1 – Apply one or more properties of integer exponents to generate equivalent numerical expressions.
Vocabulary:	Power, Base, Exponent

Comments: Chapter 1, Lesson 2

Content: Multiply and Divide Monomials   **Duration:** September (2 Days)

Essential Question:	How can multiplication and division be used to write numbers in different ways?
Skills:	• Simplify real number expressions by multiplying and dividing monomials
Instructional/Engagement Activities	
Assessment:	• Solve $(-p)(-9p^2)$ • Solve $\frac{x^8 y^{13}}{x^5 y^9}$
Resources:	Mathematics Course 3, Glencoe, pgs. 23-30

Standards:	CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions.
	
	Anchor: M08.B-E.1.1 – Represent and use expressions and equations to solve
	                            Problems involving radicals and integer exponents.
	
	Eligible Content: M08.B-E.1.1.1 – Apply one or more properties of integer
	                            exponents to generate equivalent numerical expressions.

Vocabulary:	monomial

Comments: Chapter 1, Lesson 3

Content: Powers of Monomials	**Duration:** September (3 days)
Essential Question:	How are the Laws of Exponents helpful in writing numbers in different ways?
Skills:	• Use the laws of Exponents to find powers of monomials. • Simplify using the Laws of Exponents. • Use the laws of exponents in geometric situations.
Instructional/Engagement Activities	
Assessment:	• $(a^m)^n = a^{mn}$ • $(ka^m)^n = k^n \, a^{mn}$
Resources:	Mathematics Course 3 section 1-5
Standards:	Eligible Content - M08.B-E.1.1.1 Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: 3^12 x 3^-15 = 3^-3 = 1/(3^3) Eligible Content - M08.B-E.1.1.1 Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: 3^12 x 3^-15 = 3^-3 = 1/(3^3) Eligible Content - A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers from -10 to 10).
Vocabulary:	Exponent Base Power Monomial Term

Comments: Chapter 1, Lesson 4

Content: Negative Exponents   **Duration:** September (3 days)

Essential Question:	How will it be useful to write negative exponents in multiple forms?
Skills:	• Simplify expressions involving negative exponents • Rewrite exponents using positive and negative exponents.
Instructional/Engagement Activities	
Assessment:	• $a^{-m} = 1/a^m$ • $a^m = 1/^{a-m}$
Resources:	Mathematics Course 3 section 1-5
Standards:	Eligible Content - M08.B-E.1.1.1 Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: 3^12 x 3^-15 = 3^-3 = 1/(3^3) Eligible Content - M08.B-E.1.1.1 Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: 3^12 x 3^-15 = 3^-3 = 1/(3^3) Eligible Content - A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers from -10 to 10).
Vocabulary:	Exponent Base Power Monomial Term

Comments: Chapter 1, Lesson 5

Content: Scientific Notation (including Computation)   **Duration:** September (5 days)

Essential Question:	How is scientific notation helpful in computing mathematical equations?
Skills:	• Use Scientific Notation to write large and small numbers. • Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another. • Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities. • Interpret scientific notation that has been generated by technology.
Instructional/Engagement Activities	
Assessment:	• 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 than the United States' population. • Use millimeters per year • Compute with numbers written in scientific notation. • Interpret $4.7EE9$ displayed on a calculator as 4.7×10^9
Resources:	Mathematics Course 3, Lesson 1-6 and 1-7
Standards:	CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions. Eligible Content - M08.B-E.1.1.3 Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another. Eligible Content - M08.B-E.1.1.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in 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 (e.g., interpret 4.7EE9 displayed on a calculator as 4.7 × 10^9).
Vocabulary:	Scientific notation Power of ten

Comments: Chapter 1, Lesson 6, 7

Content: Roots (including estimation)   **Duration:** September (3 days)

Essential Question:	How are square roots and cube used to draw real situations or solve problems?
Skills:	- Find Square roots and cube roots - Solve algebraic equations using roots and cube roots - Estimate to the nearest whole number and tenth of a decimal
Instructional/Engagement Activities	
Assessment:	- Evaluate square and cube roots. - Estimate cube and square roots
Resources:	Mathematics Course 3, Lesson 1-8 and 1-9
Standards:	Eligible Content - M08.B-E.1.1.2 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 perfect squares (up to and including 12^2) and cube roots of perfect cubes (up to and including 5^3) without a calculator. Eligible Content - A1.1.1.1.2 Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$). Eligible Content - A1.1.1.4.1 Use estimation to solve problems. Eligible Content - A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers from -10 to 10).
Vocabulary:	Square root Perfect Square Radical sign Cube root Perfect Cube

Comments: Chapter 1, Lesson 8, 9

Content: Compare Real Numbers

Duration: October (3 days)

Essential Question:	Why is it helpful to write numbers in different ways?
Skills:	• Identify which set of numbers a number should be classified. • Compare and order real numbers.
Instructional/Engagement Activities	
Assessment:	• Identify which set of numbers a number should be classified. • Compare and order real numbers.
Resources:	Mathematics Course 3, Lesson 10.
Standards:	CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties. M08.A-N.1.1.1 M08.A-N.1.1.2 A1.1.1.1.1 A1.1.1.1.2
Vocabulary:	Irrational Numbers Real Numbers

Comments:

Unit 2 – Expressions and Equations

At the end of this unit, students should be able to answer "How can you communicate mathematical ideas effectively?"

Students will know that linear equations in one variable can have one solution, infinitely many solutions, or no solutions. Students will learn to write and solve two-step equations and solve equations with variables on each side.

Students will learn that in a proportional relationship, the unit rate is the slope of the graph. They will graph equations of the form y = mx and y = mx + b. Students will also solve systems of equations algebraically and by graphing.

Content: Solve Equations with Rational Coefficients

Duration: October (3 days)

Essential Question:	How is equivalence in math shown and discovered?
Skills:	• Solve equations involving rational coefficients.
Instructional/Engagement Activities	
Assessment:	• Solve for a variable involving rational coefficients.
Resources:	Mathematics Course 3, Chapter 2 Lesson 1
Standards:	CC.2.2.8.B.3-Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-E.3.1.1 M08.B-E.3.1.2 M08.B-E.3.1.3 M08.B-E.3.1.4 M08.B-E.3.1.5 A1.1.2.1.1 A1.1.2.2.1 A1.1.2.2.2
Vocabulary:	Multiplicative inverse coefficient

Comments: Chapter 2, Lesson 1

Content: Two-Step Equations   **Duration:** October (4 days)

Essential Question:	What is equivalence? What order do we solve algebraic problems in?
Skills:	• Solve two-step equations.
Instructional/Engagement Activities	
Assessment:	• Solve two step equations of differing formats.
Resources:	Mathematics Course 3, Chapter 2, Lesson 2
Standards:	CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-E.3.1
Vocabulary:	Properties Two-step equation

Comments: Chapter 2, Lesson 2

Content: Writing Two-Step Equations   **Duration:** October (3 days)

Essential Question:	How can we formulate equations that represent situations?
Skills:	• Apply two-step equation processes to solve every-day problems.
Instructional/Engagement Activities	
Assessment:	• Write two-step equations from various word problems.
Resources:	Mathematics Course 3, Chapter 2, Lesson 3
Standards:	CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-E.3.1
Vocabulary:	

Comments: Chapter 2, Lesson 3

Content: Equations with Variables on Each Side	**Duration:** October (3 days)
Essential Question:	What is equivalence?
Skills:	• Solve equations with variables on each side.
Instructional/Engagement Activities	
Assessment:	• Solve an equation that includes distributive property, combining like terms, and variables on each side.
Resources:	Mathematics Course 3, Chapter 2, Lesson 4
Standards:	CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-E.3.1
Vocabulary:	

Comments: Chapter 2, Lesson 4

Content: Multi-Step Equations   **Duration:** November (3 days)

Essential Question:	What is equivalence?
Skills:	Solve Multi-Step equations
Instructional/Engagement Activities	
Assessment:	Evaluate a multi-step equation.
Resources:	Mathematics Course 3, Chapter 2, Lesson 5
Standards:	CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations. M08.B-E.3.1
Vocabulary:	Null set identity

Comments: Chapter 2, Lesson 5

Content: Constant Rate of Change   **Duration:** November (2 days)

Essential Question:	Why are graphs useful?
Skills:	• Identify proportional and non-proportional linear relationships by finding a constant rate of change.
Instructional/Engagement Activities	
Assessment:	• Determine if a graph or data set is linear or non-linear.
Resources:	Mathematics Course 3, Chapter 3 Lesson 1, p. 171
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	Linear Relationships Constant Rate of Change

Comments:

Content: Slope   **Duration:** November(3 days)

Essential Question:	Why are graphs helpful?
Skills:	• Use tables and graphs to find the slope of a line.
Instructional/Engagement Activities	
Assessment:	• Find the slope of a line given points, tables and graphs.
Resources:	Mathematics Course 3, Chapter 3, Lesson 2 Prentice Hall, p. 181
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	Slope Rise Run

Comments:

Content: Direct Variation   **Duration:** November (2 days)

Essential Question:	Why are graphs helpful?
Skills:	• Use direct variation to solve problems.
Instructional/Engagement Activities	
Assessment:	• Given a graph identify the vertical intercept and the slope of the line. • Differentiate between an intercept of zero and b
Resources:	Mathematics Course 3, Chapter 3, Lesson 3 Prentice Hall, p. 189
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	Direct variation Constant of variation Constant of proportionality

Comments:

Content: Slope-Intercept Form   **Duration:** November (4 days)

Essential Question:	Why are graphs helpful?
Skills:	• Graph Linear equations using the slope and y-intercept.
Instructional/Engagement Activities	
Assessment:	• Graph lines given m, and b.
Resources:	Mathematics Course 3, Chapter 3 Lesson 4 p. 199
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	y-intercept slope intercept form

Comments:

Content: Graph a Line Using Intercepts   **Duration:** December (2 days)

Essential Question:	Why are graphs Helpful?
Skills:	• Graph an equation using x- and y-intercepts
Instructional/Engagement Activities	
Assessment:	• Given a standard form equation, graph using the intercepts. Interpret the meaning of these intercepts.
Resources:	Mathematics Course 3, Chapter 3, Lesson 5 p. 209
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	x-intercept standard form

Comments:

Content: Write Linear Equations	**Duration:** December (4 days)

Essential Question:	Why are graphs helpful?
Skills:	• Write the equation of a line given points and/or slope
Instructional/Engagement Activities	
Assessment:	• Find and graph the equation of a line.
Resources:	Mathematics Course 3, Chapter 3, Lesson 6 p. 221
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	Point-slope form

Comments:

Content: Solve Systems of Equations by Graphing	Duration: December (2 days)

Essential Question:	Why are graphs helpful?
Skills:	• Solve systems of linear equations by graphing.
Instructional/Engagement Activities	
Assessment:	• Find the solution to a system of equations
Resources:	Mathematics Course 3, Chapter 3, Lesson 7 p. 233
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	System of equations.

Comments:

Content: Solve Systems of Equations Algebraically

Duration: December (3 days)

Essential Question:	Why are graphs helpful?
Skills:	• Solve systems of equations algebraically.
Instructional/Engagement Activities	
Assessment:	• Solve algebraic equations to find a solution.
Resources:	Mathematics Course 3, Chapter 3, Lesson 6 p. 221
Standards:	M08.B-F.1.1 – Define, evaluate, and compare functions displayed algebraically, graphically, or numerically in tables or by verbal descriptions.
Vocabulary:	Substitution.

Comments:

Unit 3

– FUNCTIONS

At the end of this unit, students should be able to answer "what constitutes a relation being a function?"

Students will know that relationships between variables in two variables can be either linear or non-linear. The unique properties of each can be determined through pattern recognition and comparison of like relationships.

Content: Relations   **Duration**: January (2 days)

Essential Question:	How can we model relationships between quantities?
Skills:	• Represent relations using tables and graphs.
Instructional/Engagement Activities	
Assessment:	• Determine the properties of a data set.
Resources:	Mathematics Course 3, Chapter 4, Lesson 2 p. 277
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	Relation Domain Relation

Comments:

Content: Functions   **Duration:** January (3 days)

Essential Question:	How can we model relationships between quantities?
Skills:	- Identify and describe functions by their traits. - Express the independent and dependent variables and their relationship. - Decide if a relation is a function.
Instructional/Engagement Activities	
Assessment:	- Decide if a data set is a function or relation. - Model functions.
Resources:	Mathematics Course 3, Chapter 4 Lesson 3
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	Function Function Table Independent variable Dependent variable

Comments:

Content: Linear Functions	**Duration:** January (2 days)
Essential Question:	How can we model relationships between quantities?
Skills:	• Graph functions and decide if they are discrete or continuous
Instructional/Engagement Activities	
Assessment:	• Create and describe graphs and visual displays of functions.
Resources:	Mathematics Course 3, Chapter 4, Lesson 4
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	Linear functions Continuous data Discrete data

Comments:

Content: Compare Function Properties   **Duration:** January (2 days)

Essential Question:	How can we model relationships between quantities?
Skills:	• Compare properties of functions.
Instructional/Engagement Activities	
Assessment:	• Compare the traits of multiple functions
Resources:	Mathematics Course 3, Chapter 4, Lesson 5
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	N/A

Comments:

Content: Construct Functions   **Duration:** January (3 days)

Essential Question:	How can we model relationships between quantities?
Skills:	- Find and interpret rate of change. - Find and interpret initial value. - Compare multiple functions.
Instructional/Engagement Activities	
Assessment:	Given data, construct functions.
Resources:	Mathematics Course 3, Chapter 4, Lesson 6, pg 319
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	

Comments:

Content: Linear and Nonlinear Functions   **Duration:** January (2 days)

Essential Question:	How can we model relationships between quantities?
Skills:	• Determine whether a table is linear or non-linear. • Determine if a relationship between two values is linear.
Instructional/Engagement Activities	
Assessment:	• Determine if a function is linear or non-linear
Resources:	Mathematics Course 3, Chapter 4, Lesson 7, pg 330
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	Nonlinear function

Comments:

Content: Qualitative Graphs   **Duration:** January(2 days)

Essential Question:	How can we model relationships between quantities?
Skills:	• Sketch or describe qualitative graphs.
Instructional/Engagement Activities	
Assessment:	• Sketch a qualitative graph.
Resources:	Mathematics Course 3, Chapter 4, Lesson 8, pg 347
Standards:	M08.B-F.2.1.1 Use concepts of functions to model relationships between quantities.
Vocabulary:	Qualitative graph

Comments:

Unit 4 – Geometry

At the end of this unit, students should be able to answer "How can algebraic concepts be applied to geometry? How can we best show or describe the change in position of a figure? How can you determine congruence and similarity? Why are formulas important in math and science?"

Students will know that algebra exists in the subject of geometry. Solving for unknown values is one of the most integral parts of real life geometry problems and a strong foundation in algebraic concepts is essential to being successful in this endeavor

Content: The Pythagorean Theorem   **Duration:** February (4 days)

Essential Question:	How can algebraic concepts be applied to geometry?
Skills:	• Find the missing length of a right triangle leg or hypotenuse. • Use the converse to determine if a triangle is a right triangle.
Instructional/Engagement Activities	
Assessment:	• Solve equations using the Pythagorean theorem. • Calculate triangle distances.
Resources:	Mathematics Course 3, Chapter 5, Lesson 5&6, pg 411
Standards:	• M08.C-G.2.1.1 Apply the converse of the Pythagorean theorem to show a triangle is a right triangle. • M08.C-G.2.1.2 Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
Vocabulary:	Legs, hypotenuse, Pythagorean theorem, converse

Comments:

Content: Distance on the Coordinate Plane   **Duration:** February (3 days)

Essential Question:	How can algebraic concepts be applied to geometry?
Skills:	• Find the distance between two points • Use scale factors to find the distance between two points
Instructional/Engagement Activities	
Assessment:	• See skills.
Resources:	Mathematics Course 3, Chapter 5, Lesson 7, pg 431
Standards:	M08.C-G.2.1.3 Apply the Pythagorean theorem to find the distance between two points in a coordinate system.
Vocabulary:	Distance formula

Comments:

Content: Translations, Rotations, Reflections, Dilations   **Duration:** February/March (10 days)

Essential Question:	How can we best show or describe the change in position of a figure?
Skills:	- Transform figures using translations, rotations, reflections, and dilations. - Describe vertices of pre-images and images - Use translation notation to describe an image
Instructional/Engagement Activities	
Assessment:	Transform figures using one or more translations
Resources:	Mathematics Course 3, Chapter 6, Lessons 1-4, pgs. 453-493
Standards:	- M08.C-G.1.1.1 Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations. - M08.C-G.1.1.2 Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them. - M08.C-G.1.1.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. - M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.
Vocabulary:	Translations, Rotations, Reflections, Dilations, transformation, pre-image, image, congruent, A' is A prime, line of reflection, center of rotation, constant of dilation

Comments:

Content: Congruency and Transformations   **Duration:** March (3 days)

Essential Question:	How can you determine congruence and similarity?
Skills:	• Determine if two figures are congruent using transformations.
Instructional/Engagement Activities	
Assessment:	• Describe similarities in figures.
Resources:	Mathematics Course 3, Chapter 7, Lessons 1, pgs. 509
Standards:	M08.C-G.1.1.2 Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.
Vocabulary:	

Comments:

Content: Similarity and Transformations   **Duration:** March (2 days)

Essential Question:	How can you determine congruence and similarity?
Skills:	• Use transformations to create similar figures • Determine if two shapes are similar • Use scale factor to determine dimensions
Instructional/Engagement Activities	
Assessment:	• Determine similarity
Resources:	Mathematics Course 3, Chapter 7, Lessons 3, pgs. 538
Standards:	M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them
Vocabulary:	Similar

Comments:

Content: Properties of Similar Polygons   **Duration:** March (2 days)

Essential Question:	How can you determine congruence and similarity?
Skills:	• Identify Similar Polygons • Find missing measures
Instructional/Engagement Activities	
Assessment:	• Describe properties of similar polygons.
Resources:	Mathematics Course 3, Chapter 7, Lessons 4, pgs. 545
Standards:	M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them
Vocabulary:	Similar polygon; scale factor

Comments:

Content: Similar Triangles and Indirect   **Duration:** March (2 days)
Measurement

Essential Question:	How can you determine congruence and similarity?
Skills:	• Solve problems involving similar triangles • Determine whether triangles are similar
Instructional/Engagement Activities	
Assessment:	• Solve similar triangles problems.
Resources:	Mathematics Course 3, Chapter 7, Lessons 5, pgs. 553
Standards:	M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.
Vocabulary:	Indirect measurement

Comments:

Content: Slope and Similar Triangles **Duration:** March (2 days)

Essential Question:	How can you determine congruence and similarity?
Skills:	• Relate the slope of a line to similar triangles • Write a proportion comparing the rise to the run for each for each similar triangle
Instructional/Engagement Activities	
Assessment:	• Use slope to determine figure similarity
Resources:	Mathematics Course 3, Chapter 7, Lessons 6, pgs. 561
Standards:	M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.
Vocabulary:	

Comments:

Content: Area and Perimeter of Similar Figures   **Duration:** March (3 days)

Essential Question:	How can you determine congruence and similarity?
Skills:	• Find the relationship between perimeters and areas of similar figures
Instructional/Engagement Activities	
Assessment:	• Calculate the demonstrate the relationships between the perimeter and areas of similar figures.
Resources:	Mathematics Course 3, Chapter 7, Lessons 7, pgs. 569
Standards:	M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.
Vocabulary:	

Comments:

Content: Volume of Cylinders, Cones, and Spheres   **Duration:** April (6 days)

Essential Question:	Why are formulas important in math and science?
Skills:	- Find the volumes of cylinders, cones, and spheres - Use volumes to model scientific scenarios
Instructional/Engagement Activities	
Assessment:	Use volumes to model scientific scenarios.
Resources:	Mathematics Course 3, Chapter 8, Lessons 1-3, pgs. 589-618
Standards:	M08.C-G.3.1.1 Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems.
Vocabulary:	Volume, cylinder, composite solid, cone, sphere, hemisphere

Comments:

<u>Unit 5 – Statistics and Probability</u>

At the end of this unit, students should be able to answer "How are patterns used when comparing two quantities?"

Students will know that statistical analysis and dispersion is essential in forecasting and modeling future events.

Content: Scatter Plots   **Duration**: April (2 days)

Essential Question:	How are patterns used when comparing two quantities?
Skills:	• Construct and make conjectures about scatter plots • Identify types of association (correlation).
Instructional/Engagement Activities	
Assessment:	• Construct and make conjectures about scatter plots
Resources:	Mathematics Course 3, Chapter 9, Lesson 1, pg 665
Standards:	M08.D-S.1.1.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive M08.D-S.1.1.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative correlation, linear association, and nonlinear association. or negative correlation, linear association, and nonlinear association.
Vocabulary:	Bivariate data; scatter plot

Comments:

Content: Lines of Best Fit   **Duration:** April (3 days)

Essential Question:	How are patterns used when comparing two quantities?
Skills:	- Draw lines of best fit and use them to make predictions - Write equations in slope-intercept form of a line of best fit.
Instructional/Engagement Activities	
Assessment:	Draw lines of best fit and use them to make predictions
Resources:	Mathematics Course 3, Chapter 9, Lesson 2, pg 677
Standards:	M08.D-S.1.1.2 For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.
Vocabulary:	Line of best fit

Comments:

Content: Two-Way Tables   **Duration:** April (2 days)

Essential Question:	How are patterns used when comparing two quantities?
Skills:	• Construct and interpret two-way tables • Find and interpret relative frequencies
Instructional/Engagement Activities	
Assessment:	• Construct and interpret two-way tables
Resources:	Mathematics Course 3, Chapter 9, Lesson 3, pg 689
Standards:	M08.D-S.1.2.1 Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible associations between the two variables.
Vocabulary:	Two-way table; relative frequency

Comments: