8th Grade Math
Curriculum Resources

Curriculum Overview

The Alabama Course of Study: Mathematics (2019) provides the framework for the K-12 study of Mathematics in Alabama's public schools. Content standards in this document are minimum and required, fundamental and specific, but not exhaustive. The standards set high expectations for student learning in all grades.

Here are definitions to help understand this curriculum guide:

- **Units of Study:** A series of lessons, experiences, and assessments aligned to standards that may last two to six weeks.
- **Priority Standards:** These are the standards students must know and be able to do to be prepared for the next grade level or course.
- **Supporting Standards:** These standards support, connect to, or enhance priority standards.
- **Knowledge:** What students should know related to the standard.
- **Skills:** What students should be able to do related to the standard.
- **Bloom's Taxonomy:** This hierarchy helps describe the complexity and requirements of a standard.
- **Quad:** This framework has four parts that help determine the rigor and relevance of a standard: Acquisition, Application, Assimilation, Adaptation.
- **ACT:** This refers to ACT standards alignment.
- **Key Understandings:** Essential ideas students need to understand about the standard.
- **Key Vocabulary:** Keywords that should be taught to ensure understanding of the standard.
- **Formative Assessment:** Frequent and ongoing checks for understanding teachers can use throughout the unit.
- **Summative Assessment:** How students will be assessed at the end of a unit to demonstrate their level of mastery of the standards.
- **Activities & Resources:** Specific examples, lessons, and/or resources that may be used to support implementation of the standard.
- **RTI:** Response to Intervention - additional supports/resources teachers can use for students who need them.
- **Extensions:** Additional activities and resources to extend the learning experience, especially for accelerated students.

8th Grade Curriculum At A Glance - Pacing Calendar

Quarter	# Weeks	Unit Name	Priority Standards	Supporting Standards
1	1	Launch Week	**Pre-Assessment**	
1	8	UNIT 1: Real Numbers	**8.1, 8.1a, 8.1b, 8.2, 8.3, 8.4, 8.4a, 8.4b, 8.5, 8.6, 8.6a, 8.6b**	
1-2	8	UNIT 2: Analyze and Solve Linear Equations	**8.7, 8.8, 8.8a, 8.9, 8.9a, 8.9b, 8.9c, 8.9d, 8.10, 8.11, 8.11a, 8.11b**	
2-3	6	UNIT 3: Use Functions to Model Relationships	**8.13, 8.14, 8.15, 8.15a, 8.16, 8.16a, 8.17**	**8.8, 8.9, 8.10**
3	2	UNIT 4: Investigate Bivariate Data	**8.18, 8.19, 8.20, 8.20a, 8.21**	**8.8, 8.9, 8.10, 8.13, 8.14**
3-4	4	UNIT 5: Analyze and Solve Systems of Linear Equations	**8.9d, 8.12, 8.12a, 8.12b**	
4	3	UNIT 6: Congruence and Similarity	**8.22, 8.22a, 8.23, 8.24, 8.25**	**8.7, 8.8, 8.9**
4	3	UNIT 7: Understand and Apply the Pythagorean Theorem	**8.26, 8.27, 8.28**	**8.1, 8.2, 8.4**
4	2	UNIT 8: Solve Problems Involving Surface Area and Volume	**8.29, 8.30**	**8.1, 8.2, 8.4**

UNIT 1: Real Numbers	DURATION: 8 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- 8.1 Define the real number system as composed of rational and irrational numbers.
  - 8.1a Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates.
  - 8.1b Convert a decimal expansion that repeats into a rational number
- 8.2 Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of irrational numbers.
- 8.3 Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions
- 8.4 Use square root and cube root symbols to represent solutions to equations.
  - 8.4a Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1000).
  - 8.4b Explain that the square root of a non-perfect square is irrational.
- 8.5 Estimate and compare very large or very small numbers in scientific notation.
- 8.6 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.
  - 8.6a Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.
  - 8.6b Interpret scientific notation that has been generated by technology.

SUPPORTING STANDARDS

- 8.2 Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of irrational numbers.
- 8.3 Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions
- 8.5 Estimate and compare very large or very small numbers in scientific notation.
- 8.6 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.
  - 8.6a Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.
  - 8.6b Interpret scientific notation that has been generated by technology.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT

Know that the real number system contains natural numbers, whole numbers, integers, rational, and irrational numbers.		Remember	A	
Know that every real number has a decimal expansion that is repeating, terminating, or is non-repeating and non-terminating.		Remember	A	
	Define the real number system by giving its components.	Remember	A	
	Explain the difference between rational and irrational numbers. specifically how their decimal expansions differ.	Understand	B	
	Convert a ratio into its decimal expansion and take a decimal expansion back to ratio form.	Apply	B	
The difference between a rational and an irrational number.		Analyze	C	
That real numbers and their decimal expansions can be approximated using a common place value to compare those expansions.		Remember	A	
	That real numbers and their decimal expansions can be approximated using a common place value to compare those expansions.	Remember	A	
That whole number exponents indicate repeated multiplication of the base number and that these exponents indicate the actual number of factors being produced.		Remember	A	
	Develop integer exponent operations in order to generate equivalent expressions through addition, multiplication, division and raising a power by another power with expressions containing integer exponents.	Create	C	

That the square root of a non-perfect square is an irrational number.		Understand	B	
Equations can potentially have two solutions.		Understand	B	
How to identify a perfect square/cube.		Understand	B	
	Define a perfect square/cube.	Remember	A	
	Evaluate radical expressions representing square and cube roots.	Apply	B	
	Solve equations with a squared or cubed variable.	Apply	B	
That scientific notation is formed using the base ten system and is the reason a 10 is used as the base number.		Understand	A	
Raising or lowering an exponent has an effect on the place value of the decimal expansion.		Apply	B	
	Write numbers in standard form in scientific notation.	Apply	B	
	Convert numbers from scientific notation back to standard form.	Apply	B	
	Use information given in scientific notation to estimate very large or small quantities given in real-world contexts.	Apply	B	
That scientific notation is formed using a base ten system.		Remember	A	
How to apply laws for multiplying and dividing exponents.		Apply	B	
	Perform multiplication and division with numbers expressed in scientific notation	Apply	B	

	to solve real-world problems, including problems where both scientific and decimal notation are used.			
	Choose between appropriate units of measure when determining solutions or estimating.	Analyze	C	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) ● Week 1: ○ Classify numbers as rational or irrational. ○ Define repeating decimals, terminating decimals, rational number, and irrational number. ○ Classify numbers as rational or irrational. ○ Demonstrate how to convert fractions to decimals. ○ Demonstrate how to convert repeating decimals to fractions. ○ Locate repeating decimals on a number line. ● Week 2: ○ Define square root, expressions, and approximations. ○ Compare and order rational and irrational numbers. ○ Identify perfect squares and square roots. ○ Demonstrate how to locate points on a vertical or horizontal number line. ○ Recall how to estimate. ● Week 3: ○ Define exponent, power, coefficient, integers, equivalent, and numerical expression. ○ Restate negative exponents as positive exponents in the form 1/x2 . ○ Restate zero exponents as 1 (x0 = 1) ○ Recognize to add exponents when multiplying terms with like bases (Property of product of powers). ○ Recognize to subtract exponents when dividing terms with like bases (Property of quotient of powers). ● Week 4: ○ Compute a numerical expression with positive exponents. ○ Restate exponential numbers as repeated multiplication. ○ Compute problems with adding and subtracting integers.	KEY VOCABULARY ● Real Number System ● Ratio ● Rational Number ● Irrational Number ● Perfect Square ● Radical ● Square Root ● Cube Root ● Perfect Cube ● Integer Exponent ● Power of Products Property ● Product of Powers Property ● Quotient of Powers Property ● Negative Exponent Property ● Zero Exponent Property ● Scientific Notation	

○ Define square root, cube root, inverse, perfect square, perfect cube, and irrational number. ○ Recognize the inverse operation of squaring a number is square root and the inverse of cubing a number is cube root. ● Week 5: ○ Restate exponential numbers as repeated multiplication. ○ Calculate the multiplication of single or multi-digit whole numbers. ○ Recognize rational and irrational numbers. ● Week 6: ○ Recognize a fraction as division of the denominator into the numerator. ○ Demonstrate that when multiplying powers of like bases; add the exponents (Property of products of powers). ○ Demonstrate that when dividing powers of like bases; subtract the exponents (Property of quotient of powers). ○ Demonstrate how to convert fractions to a decimal, with or without a calculator. ○ Recall how to write numbers in scientific notation. ○ Recall estimation strategies. ● Week 7: ○ Define Scientific Notation ○ Calculate multiplication and division of scientific notation, with or without a calculator. ○ Recall properties of exponents. ○ Recall how to write a number using scientific notation. ○ Restate exponents as repeated multiplication. ● Week 8: ○ Discuss the real-world application of scientific notation (very large or very small quantities). ○ Demonstrate difference of scientific notation symbol between paper and calculator.		
ESSENTIAL QUESTION(S) ● What are real numbers? How are real numbers used to solve problems?	**PRIOR KNOWLEDGE** ● Define rational number. ● Plot pairs of integers and/or rational numbers on a coordinate plane. ● Arrange integers and /or rational numbers on a horizontal or vertical number line. ● Locate the position of integers and/or rational numbers on a horizontal or vertical number line. ● Identify a rational number as a point on the number line.	

	• Recognize place value of whole numbers and decimals. • Give examples of rational numbers. • Define equivalent, simplify, term, distributive property, associative property of addition and multiplication, and the commutative property of addition and multiplication. • Simplify expressions with parentheses (Ex. 5(4 + x) = 20 + 5x). • Combine terms that are alike of a given expression. • Recognize the property demonstrated in a given expression. • Discuss various strategies for solving real-world and mathematical problems. • Recall steps for solving fractional problems. • Identify properties of operations for addition and multiplication. • Recall the rules for multiplication and division of rational numbers. • Recall the rules for addition and subtraction of rational numbers. • Demonstrate the location of positive and negative numbers on a vertical and horizontal number line. • Define exponent, numerical expression, algebraic expression, variable, base, power, square of a number, and cube of a number. • Compute a numerical expression with exponents, with or without a calculator. • Restate exponential numbers as repeated multiplication. • Choose the correct value to replace each variable in the expression (Substitution). • Calculate the multiplication of single or multi-digit whole numbers, with or without a calculator. • Define integers, positive and negative numbers. • Demonstrate the location of positive and negative numbers on a vertical and horizontal number line. • Give examples of positive and negative numbers to represent quantities having opposite directions in real-world contexts. • Discuss the measure of centering of 0 in relationship to positive and negative numbers. • Discover that the opposite of the opposite of a number is the number itself. • Show on a number line that numbers that are equal distance from 0 and on opposite sides of 0 have opposite signs. • Restate exponential numbers as repeated multiplication. • Define rational number. • Define the parts of a division problem including divisor, dividend, and quotient. • Write a division equation. • Apply the signs ÷ and = to the action of separating sets.

	• Recognize division as either repeated subtraction, parts of a set, parts of a whole, or the inverse of multiplication. • Model grouping with basic division facts partitioned equally (e.g. 8/2). • Apply properties of operations as strategies to subtract. • Subtract within 20. • Represent equal groups using manipulatives. • Recall that exponents are repeated multiplication. • Demonstrate the ability to multiply and divide a number by a power of ten. • Recognize the place value changes when multiplying/dividing by powers of ten.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Envision Resources	Other Resources	ACAP Resources
Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	8.1 Real Number Systems.docx 8.2 Irrationals on Number Line.docx 8.3 Integer Exponents.docx 8.4 - Square and Cube Roots.docx 8.5 & 8.6 - Scientific Notation.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

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UNIT 2: Analyze and Solve Linear Equations	DURATION: 8 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● **8.7 Determine whether a relationship between two variables is proportional or non-proportional.** ● **8.8 Graph proportional relationships.** ○ **8.8a Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation y = mx where m is the slope.** ● **8.9 Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept.** ○ **8.9a Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in a coordinate plane.** ○ **8.9b Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line.** ○ **8.9c Graph linear relationships, interpreting the slope as the rate of change of the graph and the *y*-intercept as the initial value.** ○ **8.9d Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different *y*-intercepts.** ● **8.10 Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.** ● **8.11 Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms.** ○ **8.11a Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form x *= a, a = a*, or *a = b* (where *a* and *b* are different numbers).**	SUPPORTING STANDARDS ● N/A

○ **8.11b Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem.**	

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to use rates and scale factors to find equivalent ratios.		Apply	B	
What a unit rate is and how to find it when needed.		Understand	B	
	Recognize whether ratios are in a proportional relationship using tables and verbal descriptions.	Understand	B	
What a proportion is and how it is represented on a table or verbally.		Understand	A	
How to graph coordinates and identify the origin and quadrants on the coordinate plane.		Apply	A	
	Create graphs to visually verify a constant rate as a straight line through the corresponding coordinates and the origin.	Create	C	
	Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship shown on a graph and in the form y =mx.	Understand	B	
How to graph points on a coordinate plane.		Apply	A	
Where to graph the initial value/y-intercept.		Understand	A	
Understand how/why triangles are similar.		Understand	A	

How to interpret y=mx equations.		Understand	A	
	Create a graph of linear equations in the form y = mx + b and recognize m as the slope and b as the y-intercept.	Create	C	
	Point out similar triangles formed between pairs of points and know that they have the same slope between any pairs of those points.	Understand	B	
	Show that lines may share the same slope but can have different y-intercepts.	Apply	B	
	Interpret a rate of change as the slope and the initial value as the y-intercept.	Apply	B	
The difference between proportional and non-proportional linear relationships.		Analyze	C	
What rate of change/slope represents as well as the meaning of initial value/y-intercepts when given in a variety of contexts.		Analyze	C	
	Qualitatively and quantitatively compare linear relationships in different ways when those relationships are presented within real-world problems.	Analyze	C	
How to solve one and two step equations with one variable.		Apply	A	
Write linear equations given real-world contexts.		Create	C	
That a solution to an equation can represent a real-world quantity		Evaluate	C	
	Apply the distributive property and combine like terms to simplify an equation.	Apply	A	

	Recognize a solution as representing one solution, no solution, or infinite solutions.	**Understand**	**B**	
	Analyze and solve a real-world problem and write an appropriate equation for it that leads to a solution that can be explained within the context of the problem.	**Create**	**C**	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

- **Week 1:**
  - **Define proportional, independent variable, dependent variable, unit rate.**
  - **Recall equivalent ratios and origin on a coordinate (Cartesian) plane.**
  - **Recall how to write a ratio of two quantities as a fraction.**
  - **Identify the unit rate of two quantities.**
  - **Recall that for a relationship to be proportional, both variables must start at zero.**
- **Week 2:**
  - **Define proportional relationships, unit rate, and slope.**
  - **Demonstrate how to write ratios.**
  - **Recall how to solve proportions using cross products.**
  - **Recall how to find the unit rate.**
  - **Demonstrate how to graph on a Cartesian plane.**
  - **Recall that for a relationship to be proportional, the graph must pass through the origin.**
  - **Identify the slope-intercept form (y=mx+b) of an equation where m is the slope and y is the y-intercept.**
- **Week 3:**
  - **Define linear functions, nonlinear functions, slope, and y-intercept.**
  - **Recall how to solve problems using the distributive property.**
  - **Recognize linear equations.**
  - **Identify ordered pairs.**
  - **Recognize ordered pairs.**
  - **Define similar triangles, intercept, slope, vertical, horizontal, and origin.**
- **Week 4:**

KEY VOCABULARY

- **Ratio**
- **Proportion**
- **Proportional**
- **Independent variable**
- **Dependent variable**
- **y-intercept**
- **origin**
- **Slope**
- **Rate of change**
- **Initial Value**
- **one solution**
- **no solution**
- **Infinitely many solutions**
- **like terms**
- **Distributive property**

- Recognize similar triangles.
- Generate the slope of a line using given ordered pairs.
- Analyze the graph to determine the rate of change.
- Demonstrate how to plot points on a coordinate plane using ordered pairs from table.
- Identify the slope-intercept form (y=mx+b) of an equation where m is the slope and y is the y-intercept.

- **Week 5:**
  - Graph a function given the slope-intercept form of an equation.
  - Recognize that two sets of points with the same slope may have different y-intercepts.
  - Graph a linear equation given the slope-intercept form of an equation.
  - Define proportional and nonproportional.
  - Recall that for two relationships to be proportional they must have the same unit rate and pass through the origin on a coordinate plane.
  - Apply the rule of proportional relationship to real-world context.
- **Week 6:**
  - Define linear equation, coefficient, distributive property and variable.
  - Recall how to solve equations for a missing variable.
  - Recall properties of operation for addition and multiplication.
  - Solve multi-step equations.
  - Identify properties of operations.
- **Week 7:**
  - Identify how many solutions the linear equation may or may not have.
  - Recall how to solve equations by using substitution.
- **Week 8:**
  - Create an equation to represent a real-world situation or mathematical problem.
  - Analyze the solution in context of a real-world problem.

ESSENTIAL QUESTION(S)

- How can we analyze connections between linear equations and use them to solve problems?

PRIOR KNOWLEDGE

- Define unit rate, proportion, and rate.
- Create a ratio or proportion from a given word problem.
- Calculate unit rate by using ratios or proportions.

	• Write a ratio as a fraction. • Define ratio, rate, proportion, percent, equivalent, input, output, ordered pairs, diagram, unit rate, and table. • Create a ratio or proportion from a given word problem, diagram, table, or equation. • Calculate unit rate or rate by using ratios or proportions with or without a calculator. • Restate real-world problems or mathematical problems. • Construct a graph from a set of ordered pairs given in the table of equivalent ratios. • Calculate missing input and/or output values in a table with or without a calculator. • Draw and label a table of equivalent ratios from given information. • Identify the parts of a table of equivalent ratios (input, output, etc.). • Compute the unit rate, unit price, and constant speed with or without a calculator. • Create a proportion or ratio from a given word problem. • Define unit rate, proportion, and rate. • Create a ratio or proportion from a given word problem. • Calculate unit rate by using ratios or proportions. • Write a ratio as a fraction. • Define ratio, rate, proportion, percent, equivalent, input, output, ordered pairs, diagram, unit rate, and table. • Create a ratio or proportion from a given word problem, diagram, table, or equation. • Calculate unit rate or rate by using ratios or proportions with or without a calculator. • Restate real-world problems or mathematical problems. • Construct a graph from a set of ordered pairs given in the table of equivalent ratios. • Calculate missing input and/or output values in a table with or without a calculator. • Draw and label a table of equivalent ratios from given information. • Identify the parts of a table of equivalent ratios (input, output, etc.). • Define ordered pairs. • Name the pairs of integers and/or rational numbers of a point on a coordinate plane. • Demonstrate when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or

	both axes. • Identify which signs indicate the location of a point in a coordinate plane. • Recall how to plot ordered pairs on a coordinate plane. • Define unit rate, proportion, and rate. • Calculate unit rate by using ratios or proportions. • Write a ratio as a fraction. • Define proportions and proportional relationships. • Recognize properties of numbers (Distributive, Associative, Commutative). • Define equation, inequality, and variable. • Set up equations and inequalities to represent the given situation, using correct mathematical operations and variables. • Calculate a solution or solution set by combining like terms, isolating the variable, and/or using inverse operations. • Test the found number or number set for accuracy by substitution. • Recall solving one step equations and inequalities. • Recognize properties of numbers (Distributive, Associative, Commutative). • Define equation and variable. • Set up an equation to represent the given situation, using correct mathematical operations and variables. • Calculate a solution to an equation by combining like terms, isolating the variable, and/or using inverse operations. • Test the found number for accuracy by substitution. Example: Is 5 an accurate solution of 2(x + 5)=12 . • Identify the unknown, in a given situation, as the variable. • List given information from the problem.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources **Digital Lesson Courseware:**	**Other Resources** 8.7 - Proportional or Non-	**ACAP Resources** ACAP Summative Resources

Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	Proportional.docx 8.8 Graph Proportional Relationships.docx 8.9 - Slope and Y-Intercept.docx 8.10 Compare Proportional and Non-proportional.docx 8.11 Solving Linear Equations.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

UNIT 3: Use Functions to Model Relationships	DURATION: 6 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 8.13 Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. ● 8.14 Evaluate functions defined by a rule or an equation, given values for the independent variable. ● 8.15 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. ○ 8.15a Distinguish between linear and non-linear functions. ● 8.16 Construct a function to model a linear relationship between two variables. ○ 8.16a Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph. ● 8.17 Analyze the relationship (increasing or decreasing, linear or non-linear) between two quantities represented in a graph.	SUPPORTING STANDARDS ● 8.8 Graph proportional relationships. ○ 8.8a Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation y = mx where m is the slope. ● 8.9 Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept. ○ 8.9a Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in a coordinate plane. ○ 8.9b Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line. ○ 8.9c Graph linear relationships, interpreting the slope as the rate of change of the graph and the *y*-intercept as the initial value. ○ 8.9d Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different *y*-intercepts. ● 8.10 Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems. ● 8.13 Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. ● 8.14 Evaluate functions defined by a rule or an equation, given values for the independent variable. ● 8.16 Construct a function to model a linear relationship between two variables.

	○ 8.16a Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph. ● 8.17 Analyze the relationship (increasing or decreasing, linear or non-linear) between two quantities represented in a graph.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to interpret a graph, table, mapping, and ordered pairs.		Apply	B	
	Give an accurate definition of a function.	Remember	A	
	Analyze graphs, tables, mappings, and sets of ordered pairs to determine if a relation is a function.	Analyze	C	
How to apply order of operations.		Understand	A	
That every input will produce one output for a given function.		Apply	B	
	Analyze a rule or an equation.	Analyze	C	
	Substitute given values for the input to produce a desired output	Apply	B	
How to find rates of change and initial values for function represented multiple ways.		Apply	B	
How to graph functions when given an equation, table, or verbal description.		Apply	B	
	Identify the differences between functions represented in multiple contexts.	Understand	A	
	Tell the differences between linear and nonlinear functions.	Analyze	C	

That the rate of change of a function is the ratio of change in the output to the change in the input.		Understand	A	
How to find the rate of change/slope as well as the initial value/y-intercept.		Apply	B	
	Construct the graph of a linear function.	Create	C	
	Identify the slope and y-intercept of functions in different contexts.	Understand	B	
Characteristics of representations for functions in graphic form.		Understand	A	
	Use mathematical vocabulary and understanding of functions to describe relationships between two quantities.	Apply	B	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) ● Week 1: ○ Define function, ordered pairs, input, output. ○ Demonstrate how to plot points on a Cartesian plane using ordered pairs. ○ Recall how to complete input/output tables. ○ Recognize numeric patterns. ○ Given a function, create a rule. ● Week 2: ○ Define functions, independent variables, and dependent variables. ○ Evaluate a function rule given the independent variable. ● Week 3: ○ Define rate of change. ○ Recognize linear and nonlinear functions. ○ Recall how to read/interpret information from a table. ○ Identify algebraic expressions. ○ Recall how to name points on a Cartesian plane using ordered pairs. ○ Compare and contrast the differences between linear and	KEY VOCABULARY ● Relation ● Function ● Input ● Output ● Evaluate ● Linear ● Non-linear ● Slope ● Y-Intercept ● Increasing ● Decreasing	

nonlinear functions. ● Week 4: ○ Define function, rate of change, and initial value. ○ Recall how to complete an input/output function table. ○ Recall how to find the rate of change (slope) in a linear equation. ○ Recall how to name points from a graph (ordered pairs). ● Week 5: ○ Analyze real-world situations to identify the rate of change and initial value from a table, graph, or description. ○ Define qualitative, increase, and decrease. ○ Distinguish the difference between linear and nonlinear functions. ● Week 6: ○ Recall how to plot points on a Cartesian plane. ○ Identify parts of the Cartesian plane. ○ Recognize ordered pairs. ○ Compare and contrast the relationship between two quantities in a graph.		
ESSENTIAL QUESTION(S) ● How can you use functions to model linear relationships?	**PRIOR KNOWLEDGE** ● Define quadrant, coordinate plane, coordinate axes (x-axis and y-axis), horizontal, vertical, and reflection. ● Demonstrate an understanding of an extended coordinate plane. ● Draw a four-quadrant coordinate plane. ● Draw and extend vertical and horizontal number lines. ● Interpret graphing points in all four quadrants of the coordinate plane in real-world situations. ● Recall how to graph points in all four quadrants of the coordinate plane. ● Define equation and variable. ● Set up an equation to represent the given situation, using correct mathematical operations and variables. ● Calculate a solution to an equation by combining like terms, isolating the variable, and/or using inverse operations. ● Test the found number for accuracy by substitution. Example: Is 5 an accurate solution of $2(x + 5)=12$. ● Identify the unknown, in a given situation, as the variable. ● List given information from the problem. ● Recalling one-step equations. ● Define expression, equivalent, and equivalent expressions.	

	• Recall mathematical terms such as sum, difference, etc. • Recognize that a variable without a written coefficient is understood to have a coefficient of one. • Recall how to convert mathematical terms to mathematical symbols and numbers and vice versa. • Restate numerical expressions with words. • Solve an equation by substituting a value to find an output. • Find the coordinates of an ordered pair. • Recognize how the steepness of a graphed line changes vertically and horizontally. • Define quadrant, coordinate plane, coordinate axes (x-axis and y-axis), horizontal, vertical, and reflection. • Demonstrate an understanding of an extended coordinate plane. • Draw a four-quadrant coordinate plane. • Draw and extend vertical and horizontal number lines. • Interpret graphing points in all four quadrants of the coordinate plane in real-world situations. • Recall how to graph points in all four quadrants of the coordinate plane.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Envision Resources	Other Resources	ACAP Resources
Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	8.13 - Defining Functions.docx 8.14 - Evaluating Functions.docx 8.15 & 8.17 Compare and Analyze Functions.docx 8.16 Linear Functions.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES

iReady-My Path **Reteach To Build Understanding (Teaching Resource)** **Additional Vocabulary Support (Teaching Resource)** **Build Mathematical Literacy (Teaching Resource)** **Math Tools & Games (Digital Lesson Courseware)**	**Enrichment (Teaching Resource)** **Math Tools & Games (Digital Lesson Courseware)** **Pick A Stem Project (Digital Topic Support)**

UNIT 4: Investigate Bivariate Data	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • 8.18 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and non-linear association, clustering, and outliers. • 8.19 Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and assess the model fit by judging the closeness of the data points to the line. • 8.20 Use a linear model of a real-world situation to solve problems and make predictions. ○ 8.20a Describe the rate of change and *y*-intercept in the context of a problem using a linear model of a real-world situation. • 8.21 Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables.	SUPPORTING STANDARDS • 8.8 Graph proportional relationships. • 8.9 Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept. • 8.10 Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems. • 8.13 Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. • 8.14 Evaluate functions defined by a rule or an equation, given values for the independent variable.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Representations for bivariate data and techniques for constructing each (tables, scatter plots).		Analyze	C	
	Construct a scatter plot to represent a set of bivariate data.	Create	C	
	Use mathematical vocabulary to describe and interpret patterns in bivariate data.	Apply	B	
Patterns found on scatter plots of bivariate data, (linear/non-linear,		Understand	B	

positive/negative).				
Strategies for informally fitting straight lines to bivariate data with a linear relationship.		Apply	B	
Methods for finding the distance between two points on a coordinate plane and between a point and a line.		Apply	B	
	Construct a scatter plot to represent a set of bivariate data.	Create	C	
	Use mathematical vocabulary to describe and interpret patterns in bivariate data.	Apply	B	
	Use logical reasoning and appropriate strategies to draw a straight line to fit data that suggest a linear association.	Apply	B	
	Use mathematical vocabulary, logical reasoning, and closeness of data points to a line to judge the fit of the line to the data.	Evaluate	C	
Strategies for determining slope and y-intercept of a linear model.		Apply	B	
	Represent contextual and mathematical situations involving bivariate measurement data with a linear relationship algebraically and graphically.	Create	C	
	Use mathematical vocabulary to describe and interpret slopes and y-intercepts of	Apply	B	

	lines which represent contextual situations involving bivariate data.			
	Make predictions about unobserved data using the equation and graph.	Create	C	
Characteristics of data sets that distinguish categorical data from measurement data.		Understanding	B	
	Construct two-way tables for categorical data.	Create	C	
	Find relative frequencies for cells in the two-way tables.	Analyze	C	
	Conjecture about patterns of association in the two-way tables and explain the reasoning that leads to the conjecture	Evaluate	C	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) ● Week 1: ○ Define bivariate scatter plot, outlier, cluster, linear, nonlinear, and positive and negative association, quantitative, line of best fit, and variable. ○ Describe patterns found in a scatter plot. ○ Demonstrate how to label and plot information on a scatter plot (dot plot). ○ Distinguish the difference between positive and negative	KEY VOCABULARY ● Scatter plot ● Bivariate measurement data ● Clustering ● Outliers ● Positive and negative association ● No association	

correlation. ○ Recall how to describe the spread of the scatter plot (dot plot). ○ Analyze scatter plots to determine the line of best fit. ○ Explain how to draw informal inferences from data distributions. ○ Recall how to summarize numerical data sets in relation to their context. ○ Recognize the concept of outlier and its relationship to the data distribution. ○ Draw an estimate for a line of best fit. ● Week 2: ○ Define slope, intercept, linear, equation, and bivariate. ○ Recall how to determine the rate of change (slope) from a graph. ○ Identify the parts of the slope-intercept form of an equation. ○ Recognize how to read a graph. ○ Recall how to write an equation in slope-intercept form. ○ Apply the identification of the slope and the y-intercept to a real-world situation. ○ Create a graph to model a real-word situation. ○ Define relative frequency and frequency. ○ Design a two-way table. ○ Analyze a two-way table containing categorical variables. ○ Calculate relative frequency. ○ Discuss relative frequency. ○ Design a table. ○ Recall how to calculate frequency. ○ Recall how to collect data.	● Linear association ● Nonlinear Association ● Quantitative variable ● Linear model ● Bivariate measurement data ● Slope ● Y-Intercept ● Two-way table ● Rows ● Columns ● Bivariate categorical data ● Frequencies ● Relative frequencies ● Categorical variables	
ESSENTIAL QUESTION(S) ● How can you represent the relationship between paired data and use the representation to make predictions?	PRIOR KNOWLEDGE ● Define numerical data set, measure of variation, and measure of center. ● Relate the measure of variation, of a data set, with the concept of range. ● Relate the measure of the center for a numerical data set with the concept of measure of center. ● Define numerical data set, quantitative, measure of center, median, frequency distribution, and attribute. ● Compare and contrast the center and variation. ● Collect the data.	

	• Organize the data. • Describe how attribute was measured including units of measurement. • Identify the attribute used to create the numerical set. • Define numerical data set, measure of variation, and measure of center. • Relate the measure of variation, of a data set, with the concept of range. • Relate the measure of the center for a numerical data set with the concept of measure of center. • Define numerical data set, quantitative, measure of center, median, frequency distribution, and attribute. • Compare and contrast the center and variation. • Collect the data. • Organize the data. • Describe how the attribute was measured including units of measurement. • Identify the attribute used to create the numerical set. • Define equation and variable. • Set up an equation to represent the given situation, using correct mathematical operations and variables. • Calculate a solution to an equation by combining like terms, isolating the variable, and/or using inverse operations. • Test the found number for accuracy by substitution. Example: Is 5 an accurate solution of 2(x + 5)=12?. • Identify the unknown, in a given situation, as the variable. • List given information from the problem. • Recalling one-step equations. • Define numerical data set, quantitative, measure of center, median, frequency distribution, and attribute. • Compare and contrast the center and variation. • Collect the data. • Organize the data. • Describe how attribute was measured including units of measurement. • Identify the attribute used to create the numerical set.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	**Other Resources** 8.18 - Scatter Plots.docx 8.19 - Line of Best Fit.docx 8.20 - Predictions.docx 8.21 - Two-way Table.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	**ACAP Resources** ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

UNIT 5: Analyze and Solve Systems of Linear Equations	DURATION: 4 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 8.9d Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different _y_-intercepts. ● 8.12 Solve systems of two linear equations in two variables by graphing and substitution. ○ 8.12a Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. ○ 8.12b Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.	SUPPORTING STANDARDS ●

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to graph points on a coordinate plane.		Understand	A	

Where to graph the initial value/y-intercept.		Understand	A	
Understand how/why triangles are similar.		Understand	A	
How to interpret y=mx equations.		Apply	B	
	Create a graph of linear equations in the form y = mx + b and recognize m as the slope and b as the y-intercept.	Create	C	
	Point out similar triangles formed between pairs of points and know that they have the same slope between any pairs of those points.	Analyze	C	
	Show that lines may share the same slope but can have different y-intercepts.	Analyze	C	
	Interpret a rate of change as the slope and the initial value as the y-intercept.	Apply	B	
The properties of operations and equality and their appropriate application.		Apply	B	
Graphing techniques for linear equations (using points, using slope-intercept form, using technology).		Apply	B	
Substitution techniques for algebraically finding the solution to a system of linear equations.		Apply	B	

	Generate a table from an equation.	Apply	B	
	Graph linear equations.	Apply	B	
	Identify the ordered pair for the point of intersection.	Apply	B	
	Explain the meaning of the point of intersection (or lack of intersection point) in context.	Understand	B	
	Solve a system algebraically using substitution when both equations are written in slope-intercept form or one is written in standard form and the other in slope-intercept form.	Apply	B	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

- **Week 1:**
  - **Define variables.**
  - **Recall how to estimate.**
  - **Recall how to solve linear equations.**
  - **Demonstrate how to graph solutions to linear equations.**
  - **Recall how to graph ordered pairs on a Cartesian plane.**
- **Week 2:**
  - **Recall that linear equations can have one solution (intersecting), no solution (parallel lines), or infinitely many solutions (graph is simultaneous).**
  - **Define simultaneous.**
  - **Recall how to solve linear equations.**
  - **Recall properties of operations for addition and multiplication.**
- **Week 3:**
  - **Discover that the intersection of two lines on a coordinate plane is the solution to both equations.**

KEY VOCABULARY

- **Slope**
- **Rate of change**
- **Initial Value**
- **Y-intercept**
- **System of linear equations**
- **Point of intersection**
- **One solution**
- **No solution**
- **Infinitely many solutions**
- **Parallel lines**
- **Slope-intercept form of a linear equation**
- **Standard form of a linear equation**

○ Define point of intersection. ○ Recall how to solve linear equations. ○ Demonstrate how to graph on the Cartesian plane. ○ Identify ordered pairs. ● Week 4: ○ Recall how to solve linear equations in two variables by using substitution ○ Create a word problem from given information. ○ Recall how to solve linear equations. ○ Explain how to write an equation to solve real-world mathematical problems. ●		

ESSENTIAL QUESTION(S)	PRIOR KNOWLEDGE
● What does it mean to solve a system of linear equations?	● Define ordered pairs. ● Name the pairs of integers and/or rational numbers of a point on a coordinate plane. ● Demonstrate when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ● Identify which signs indicate the location of a point in a coordinate plane. ● Recall how to plot ordered pairs on a coordinate plane. ● Define quadrant, coordinate plane, coordinate axes (x-axis and y-axis), horizontal, vertical, and reflection. ● Demonstrate an understanding of an extended coordinate plane. ● Draw a four-quadrant coordinate plane. ● Draw and extend vertical and horizontal number lines. ● Interpret graphing points in all four quadrants of the coordinate plane in real-world situations. ● Recall how to graph points in all four quadrants of the coordinate plane.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Envision Resources	Other Resources	ACAP Resources
Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	8.9 - Slope and Y-Intercept.docx 8.12 Systems.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

UNIT 6: Congruence and Similarity	DURATION: 3 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 8.22 Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines. ○ 8.22a Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship. ● 8.23 Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two-dimensional figures. ● 8.24 Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them. ● 8.25 Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures.	SUPPORTING STANDARDS ● 8.7 Determine whether a relationship between two variables is proportional or non-proportional. ● 8.8 Graph proportional relationships. ● 8.9 Interpret _y = mx + b_ as defining a linear equation whose graph is a line with _m_ as the slope and _b_ as the _y_-intercept.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to measure line segments and angles.		Understand	A	
That similar figures have congruent angles.		Understand	A	
The definition/concept of what a figure does when it undergoes a rotation, reflection, and translation.		Remember	A	

How to perform a translation, reflection, and rotation.		**Apply**	**B**	
	Verify by measuring and comparing lengths of a figure and its image that after a figure has been translated, reflected, or rotated its corresponding lines and line segments remain the same length.	**Evaluate**	**C**	
What it means to translate, reflect, rotate, and dilate a figure.		**Understand**	**A**	
How to perform a translation, reflection, rotation, and dilation of a figure.		**Apply**	**B**	
How to apply (x, y) notation to describe the effects of a transformation.		**Apply**	**B**	
	Select and apply the proper coordinate notation/rule when given a specific transformation for a figure.	**Apply**	**B**	
	Graph a pre-image/image for a figure on a coordinate plane when given a specific transformation or sequence of transformations.	**Apply**	**B**	
How to perform rigid transformations and dilations graphically and algebraically (applying coordinate rules).		**Apply**	**B**	

What makes figures similar and congruent.		Analyze	C	
	Use mathematical language to explain how transformations can be used to prove that two figures are similar or congruent.	Evaluate	C	
	Demonstrate/perform a series of transformations to prove or disprove that two figures are similar or congruent.	Evaluate	C	
That a straight angle is 180 degrees.		Understand	A	
That a triangle has three interior angles whose sum is 180 degrees.		Understand	A	
The definition of transversal.		Remember	A	
How to write and solve two-step equations.		Apply	A	
	Make conjectures about the relationships and measurements of the angles created when two parallel lines are cut by a transversal.	Create	C	
	Informally prove that the sum of any triangle's interior angles will have the same measure as a straight angle.	Evaluate	C	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

- **Week 1:**
  - **Define rotation, reflection, and translation.**
  - **Recognize translations (slides), rotations (turns), and reflections (flips).**
  - **Distinguish between lines and line segments.**
  - **Demonstrate how to measure length.**
  - **Demonstrate how to use a protractor to measure angles.**
  - **Identify parallel lines.**
  - **Define congruent and sequence.**
  - **Compare translations to reflections.**
  - **Compare reflections to rotations.**
  - **Compare rotations to translations.**
  - **Identify attributes of two-dimensional figures.**
  - **Identify congruent figures.**
- **Week 2:**
  - **Define dilation.**
  - **Recall how to find scale factor.**
  - **Give examples of scale drawings.**
  - **Recognize translations, reflections, rotations.**
  - **Define similar.**
  - **Recognize dilations, rotations, reflections, and translations.**
  - **Identify similar figures.**
  - **Analyze an image and its dilation to determine if the two figures are similar.**
- **Week 3:**
  - **Define exterior angles, interior angles, vertical angles, adjacent angles, alternate interior angles, alternate exterior angles, corresponding angles, and transversal.**
  - **Identify attributes of triangles.**
  - **Identify exterior angles, interior angles, vertical angles, adjacent angles, alternate interior angles, alternate exterior angles, and corresponding angles.**
  - **Identify a transversal.**
  - **Apply properties to find missing angle measures.**
  - **Discover the Angle Sum Theorem (sum of the interior angles of a triangle equal 180 degrees).**

KEY VOCABULARY

- **Congruent**
- **Rotation**
- **Reflection**
- **Translation**
- **Coordinates**
- **Congruent**
- **Rotation**
- **Reflection**
- **Translation**
- **Dilation**
- **Scale factor**
- **Transversal**
- **Corresponding Angles**
- **Vertical Angles**
- **Alternate Interior Angles**
- **Alternate Interior Angles**
- **Supplementary**
- **Adjacent**

ESSENTIAL QUESTION(S)

- **How can you show that two figures are either congruent or similar to one another?**

PRIOR KNOWLEDGE

- **Define ordered pairs.**
- **Name the pairs of integers and/or rational numbers of a point on a coordinate plane.**

	• Demonstrate when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. • Identify which signs indicate the location of a point in a coordinate plane. • Recall how to plot ordered pairs on a coordinate plane. • Define reflections. • Define reflections. • Calculate the distances between points having the same first or second coordinate using absolute value. • Define scale, scale drawings, length, area, and geometric figures. • Locate/use scale on a map. • Identify proportional relationships. • Define ordered pairs. • Name the pairs of integers and/or rational numbers of a point on a coordinate plane. • Demonstrate when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. • Identify which signs indicate the location of a point in a coordinate plane. • Recall how to plot ordered pairs on a coordinate plane. • Define reflections. • Calculate the distances between points having the same first or second coordinate using absolute value. • Define supplementary angles, complementary angles, vertical angles, adjacent angles, parallel lines, perpendicular lines, and intersecting lines. • Discuss strategies for solving multi-step problems and equations. • Identify all types of angles. • Identify right angles and straight angles.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Envision Resources	Other Resources	ACAP Resources
Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	8.23 Coordinate Transformation.docx 8.25 Angles and Transversals.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

UNIT 7: Understand and Apply the Pythagorean Theorem	DURATION: 3 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • 8.26 Informally justify the Pythagorean Theorem and its converse. • 8.27 Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane. • 8.28 Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications.	SUPPORTING STANDARDS • 8.1 Define the real number system as composed of rational and irrational numbers. • 8.2 Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers. • 8.4 Use square root and cube root symbols to represent solutions to equations.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
The Pythagorean Theorem		Remember	A	
	Use mathematical reasoning and vocabulary to verbally explain a proof of the Pythagorean Theorem and its converse.	Evaluate	B	
The Pythagorean Theorem.		Remember	A	
The operations and labeling within a coordinate system.		Understand	A	
	Solve equations involving one variable and square root.	Apply	A	
	Represent real-world and mathematical contexts involving right triangles in a variety of formats (drawings on	Apply	B	

	coordinate planes, equations).			
	Justify solutions and solution paths using conceptual understandings and vocabulary related to the Pythagorean Theorem (right angle, hypotenuse).	Evaluate	C	
The Pythagorean Theorem.		Remember	A	
Appropriate labeling of a right triangle, leg and hypotenuse.		Understand	A	
	Solve equations involving one variable and square root.	Apply	A	
	Represent real-world and mathematical contexts involving right triangles in a variety of formats (drawings, equations).	Apply	B	
	Justify solutions and solution paths using conceptual understandings and vocabulary related to the Pythagorean Theorem (right angle, hypotenuse).	Evaluate	C	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) ● Week 1: ○ Define a right angle, Pythagorean Theorem, converse, and proof. ○ Recognize examples of right triangles. ○ Demonstrate how to find square roots. ○ Solve problems with exponents. ● Week 2: ○ Recall how to name points on a Cartesian plane using ordered pairs.	KEY VOCABULARY ● Pythagorean Theorem ● Converse	

○ Recognize ordered pairs (x, y). ○ Solve problems using the Pythagorean Theorem, with or without a calculator. ○ Identify right triangles. ○ Demonstrate how to find square roots, with or without a calculator. ○ Solve problems with exponents, with or without a calculator. ● Week 3: ○ Discuss strategies for solving real-world and mathematical problems. ○ Solve problems using the Pythagorean Theorem, with or without a calculator. ○ Identify right triangles. ○ Demonstrate how to find square roots, with or without a calculator. ○ Solve problems with exponents, with or without a calculator.		
ESSENTIAL QUESTION(S) ● How can you use the Pythagorean Theorem to solve problems?	PRIOR KNOWLEDGE ● Define supplementary angles, complementary angles, vertical angles, adjacent angles, parallel lines, perpendicular lines, and intersecting lines. ● Discuss strategies for solving multi-step problems and equations. ● Identify all types of angles. ● Identify right angles and straight angles. ● Define area, special quadrilaterals, right triangles, and polygons. ● Analyze the area of other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes. ● Apply area formulas to solve real-world mathematical problems. ● Demonstrate how the area of a rectangle is equal to the sum of the area of two equal right triangles. ● Explain how to find the area for rectangles. ● Select manipulatives to demonstrate how to compose and decompose triangles and other shapes. ● Recognize and demonstrate that two right triangles make a rectangle. ● Define exponent, numerical expression, algebraic expression, variable, base, power, square of a number, and cube of a number. ● Compute a numerical expression with exponents, with or without a calculator. ● Restate exponential numbers as repeated multiplication.	

	• Choose the correct value to replace each variable in the expression (Substitution).

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples Online Practice Powered by MathXL Virtual Nerd Video Tutorials Digital Math Tools	**Other Resources** 8.28 Pythagorean Thm.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	**ACAP Resources** ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES
iReady-My Path Reteach To Build Understanding (Teaching Resource) Additional Vocabulary Support (Teaching Resource) Build Mathematical Literacy (Teaching Resource) Math Tools & Games (Digital Lesson Courseware)	Enrichment (Teaching Resource) Math Tools & Games (Digital Lesson Courseware) Pick A Stem Project (Digital Topic Support)

UNIT 8: Solve Problems Involving Surface Area and Volume	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • 8.29 Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions. • 8.30 Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real-world problems.	SUPPORTING STANDARDS • 8.1 Define the real number system as composed of rational and irrational numbers. • 8.2 Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers. • 8.4 Use square root and cube root symbols to represent solutions

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
The difference between volume and surface area.		Understand	A	
That volume is defined as the number of unit cubes needed to create or fill the 3-dimensional figure.		Remember	A	
	Find the volume of cones, cylinders, and spheres.	Apply	A	
	Show the relationship between the volume of a cone, a cylinder, and a sphere with the same radius.	Analyze	C	
The volume formulas for cylinders, cones, and spheres.		Remember	A	
That 3.14 is an approximation of pi		Remember	A	

commonly used in these volume formulas.				
That composite three dimensional objects in the real-world can be created by combining cylinders, cones, and spheres in part or whole.		Understand	A	
	Calculate the volume of cones, cylinders, and spheres given in real-world contexts. often times approximating solutions to a specified decimal place.	Apply	B	
	Identify the components of a composite figure as being portions of or whole cylinders, cones, and spheres.	Understand	A	
	Combine the results of calculations to find volume for real-world composite figures.	Analyze	C	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) ● Week 1: ○ Define volume. ○ Identify cone, sphere, and cylinder. ○ Recall the meaning of a radius and diameter. ○ Compare and contrast cone, sphere, and cylinder. ○ Derive the formulas for the volume of a cone, cylinder, and sphere. ● Week 2: ○ Define formula, volume, cone, cylinders, spheres, and height. ○ Discuss the measure of volume and give examples. ○ Solve problems with exponents, with or without a calculator. ○ Recall how to find circumference of a circle, with or	KEY VOCABULARY ● Radius ● Pi ● Volume ● Cylinder ● Cone ● Sphere	

without a calculator. ○ Identify parts of a circle. ○ Calculate the volume of three-dimensional figures. ○ Solve real-world problems using the volume formulas for three-dimensional figures, with or without a calculator.		
ESSENTIAL QUESTION(S) ● How are the formulas for volume of a cylinder, cone, and sphere related to one another?	**PRIOR KNOWLEDGE** ● Define volume, surface area, triangles, quadrilaterals, polygons, cubes, and right prisms. ● Discuss strategies for solving real-world mathematical problems. ● Recall formulas for calculating volume and surface area. ● Identify the attributes of triangles, quadrilaterals, polygons, cubes, and right prisms. ● Define volume, surface area, triangles, quadrilaterals, polygons, cubes, and right prisms. ● Discuss strategies for solving real-world mathematical problems. ● Recall formulas for calculating volume and surface area. ● Identify the attributes of triangles, quadrilaterals, polygons, cubes, and right prisms. ● Define diameter, radius, circumference, area of a circle, and formula. ● Identify and label parts of a circle. ● Recognize the attributes of a circle. ● Apply the formula of area and circumference to real-world mathematical situations.	

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Envision Resources	Other Resources	ACAP Resources
Digital Lesson Courseware: Today's Challenge Visual Learning Animation Plus Key Concept Additional Examples	8.28 Pythagorean Thm.docx Youtube Kahoot Quizlet Live iReady (Teacher Assigned)	ACAP Summative Resources

Online Practice Powered by MathXL **Virtual Nerd Video Tutorials** **Digital Math Tools**		

RTI **iReady-My Path** **Reteach To Build Understanding (Teaching Resource)** **Additional Vocabulary Support (Teaching Resource)** **Build Mathematical Literacy (Teaching Resource)** **Math Tools & Games (Digital Lesson Courseware)**	**EXTENSION OPPORTUNITIES** **Enrichment (Teaching Resource)** **Math Tools & Games (Digital Lesson Courseware)** **Pick A Stem Project (Digital Topic Support)**