Spring Lake Middle School
Math Grade 8 Curriculum Map – By CCSS order

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
The Number System	***8.NS.1*** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	**How can rational numbers be represented and how can they be useful when examining situations involving numbers that are not whole?** **How can irrational numbers be represented and how can they be useful when examining situations involving numbers that are not rational?**	I can classify a number as rational or irrational based on its decimal expansion. I can convert a repeating decimal into a rational number.	BIG IDEAS 6.3 Approximating Square Roots 6.3b Real Numbers 6.4 Simplifying Square Roots PH COURSE 3 4.2 Equivalent Forms of Rational Numbers 4.3 Comparing and Ordering Rational Numbers 4.8 Exploring Square Roots and Irrational Numbers ON CORE 1.5 Rational Numbers 1.6 Irrational Numbers		
	8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.	**How can rational numbers be represented and how can they be useful when examining situations involving numbers that are not whole?** **How can irrational numbers be represented and how can they be useful when examining situations involving numbers that are not rational?**	I can use reasoning to determine between which two consecutive whole numbers a square root will fall (e.g., I can reason that $\sqrt{39}$ is between 6 and 7 since it is between $\sqrt{36}$ and $\sqrt{49}$). I can plot the estimated value of an irrational number on a number line. I can estimate the value of an irrational number by rounding to a specific place value. I can use estimated values to compare two or more irrational numbers.	BIG IDEAS 6.3 Approximating Square Roots 6.3b Real Numbers 6.4 Simplifying Square Roots PH COURSE 3 4.2 Equivalent Forms of Rational Numbers 4.3 Comparing and Ordering Rational Numbers 4.8 Exploring Square Roots and Irrational Numbers ON CORE 1.5 Rational Numbers 1.6 Irrational Numbers		

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Expressions and Equations	***8.EE.1*** Know and apply the properties of integer exponents to generate equivalent numerical expressions.	**How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?** **How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?**	I can use the sum of angle measures of a triangle to explore simple equation solving. I can use the Properties of Equality to solve one-step equations. I can use the properties of real numbers to determine the solution of a linear equation. I can simplify linear equations by using the distributive property and/or combining like terms. I can give examples of linear equations with one solution, infinitely many solutions, or no solution. I can determine the properties of integer exponents by exploring patterns and applying my understanding of properties of whole number exponents. I can use the properties of integer exponents to simplify expressions.	BIG IDEAS 9.1 Exponents 9.2 Product of Powers Property 9.3 Quotient of Powers Property 9.4 Zero and Negative Exponents PH COURSE 3 7.2 Exponents and Multiplication 7.3 Exponents and Division 7.4 Power Rules ON CORE 1.1 Integer Exponents		
	8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	**How can rational numbers be represented and how can they be useful when examining situations involving numbers that are not whole?** **How can irrational numbers be represented and how can they be useful when examining situations involving numbers that are not rational?**	I can classify a number as rational or irrational based on its decimal expansion. I can convert a repeating decimal into a rational number. I can use reasoning to determine between which two consecutive whole numbers a square root will fall (e.g., I can reason that $\sqrt{39}$ is between 6 and 7 since it is between $\sqrt{36}$ and $\sqrt{49}$). I can plot the estimated value of an irrational number on a number line.	BIG IDEAS 6.1 Finding Square Roots 6.3 Approximating Square Roots 6.3b Real Numbers 6.4 Simplifying Square Roots PH COURSE 3 4.8 Exploring Square Roots and Irrational Numbers ON CORE 1.4 Square Roots and Cube Roots 1.5 Rational Numbers 1.6 Irrational Numbers		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			I can estimate the value of an irrational number by rounding to a specific place value. I can use estimated values to compare two or more irrational numbers. I can recognize taking a square root as the inverse of squaring a number. I can recognize taking a cube root as the inverse of cubing a number. I can evaluate the square root of a perfect square. I can evaluate the cube root of a perfect cube. I can justify that the square root of a non-perfect square will be irrational.			
	8.EE.3 Use numbers expressed in the form of a singe digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much on is than the other.	**How can algebraic expressions and equations be mindfully manipulated to reach a solution of real-life problems or make sense of quantitative relationships?**	I can write an estimation of a large quantity by expressing it as the product of a single-digit number and a positive power of ten. I can write an estimation of a very small quantity by expressing it as the product of a single-digit number and a positive power of ten. I can compare quantities written as the product of a single-digit number and a power of ten by stating their multiplicative relationships. I can add, subtract, multiply, and divide two numbers written in scientific notation. I can select the appropriate units for measuring derived measurements when	BIG IDEAS 9.5 Reading Scientific Notation 9.6 Writing Scientific Notation 9.6b Using Scientific Notation PH COURSE 3 7.1 Scientific Notation 7.2 Exponents and Multiplication 7.3 Exponents and Division 7.4 Power Rules ON CORE 1.2 Scientific Notation 1.3 Operations with Scientific Notation		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			comparing quantities written in scientific notation. I can identify and interpret the various ways scientific notation is displayed on calculators and through computer software.			
	8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.	**How can algebraic expressions and equations be mindfully manipulated to reach a solution of real-life problems or make sense of quantitative relationships?**	I can write an estimation of a large quantity by expressing it as the product of a single-digit number and a positive power of ten. I can write an estimation of a very small quantity by expressing it as the product of a single-digit number and a positive power of ten. I can compare quantities written as the product of a single-digit number and a power of ten by stating their multiplicative relationships. I can add, subtract, multiply, and divide two numbers written in scientific notation. I can select the appropriate units for measuring derived measurements when comparing quantities written in scientific notation. I can identify and interpret the various ways scientific notation is displayed on calculators and through computer software.	BIG IDEAS 9.5 Reading Scientific Notation 9.6 Writing Scientific Notation 9.6b Using Scientific Notation PH COURSE 3 7.1 Scientific Notation 7.2 Exponents and Multiplication 7.3 Exponents and Division 7.4 Power Rules ON CORE 1.2 Scientific Notation 1.3 Operations with Scientific Notation		
	8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	**How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?** **How are functions graphed and how are they useful?** **How are functions useful in making sense of patterns and solving problems**	I can convert between customary and metric units using proportional relationships. I can explain that a function represents a relationship between an input and an output where the output depends on the input; there can be only one output for each input. I can analyze the rate of change between input and output values to determine if a function is linear or non-linear.	BIG IDEAS 1.5 Converting Units of Measure PH COURSE 3 5.2 Choosing and Converting Units ON CORE 2.2 Graphing Linear Functions 2.3 Rate of Change and Slope 2.6 Comparing Functions		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
		involving quantitative relationships? **How can algebraic expressions and equations be used to model, analyze, solve mathematical situations, and make sense of the quantitative relationships?**	I can graph a proportional relationship in the coordinate plane. I can interpret the unit rate of a proportional relationship as the slope of the graph. I can justify that the graph of a proportional relationship will always intersect the origin of the graph. I can use a graph, a table, or an equation to determine the unit rate of a proportional relationship and use the unit rate to make comparisons between various proportional relationships.	BIG IDEAS 2.2 Slope of a Line PH COURSE 3 3.3 Understanding Slope ON CORE 2.2Graphing Linear Functions 2.3 Rate of Change and Slope 2.6 Comparing Functions BIG IDEAS 4.4b Comparing Rates PH COURSE 3 3.4 Using the Y-Intercept 5.1 Ratios and Rates 5.3 Write an Equation ON CORE 2.2 Graphing Linear Functions 2.3 Rate of Change and Slope 2.6 Comparing Functions		
	8.EE.6 Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx+b$ for a line through the origin and the equation $y = mx+b$ for a line intercepting the vertical axis at *b*.	**How are functions graphed and how are they useful?** **How are functions written and how are they solved and used?**	I can justify the since the triangles are similar, the ratios of all corresponding hypotenuses, representing the slope of the line, will be equivalent. I can graph linear equations written in standard form. I can justify that an equation in the form $y = mx+b$ will represent the graph of a proportional relationship with a slope of *m* and a y-intercept of *b* I can write and justify an equation in the form $y= mx + b$ given the slope (m) and a point on the line. I can write a linear equation given two points and the rate of change between the two points.	BIG IDEAS 2.2b Triangles and Slope 2.3 Graphing Linear Equations in Slope-Intercept Form 2.4 Graphing Linear Equations in Standard Form PH COURSE 3 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph 3.6 Using Graphs of Equations ON CORE 2.4 Slope-Intercept Form BIG IDEAS 3.1 Writing Equations in Slope-Intercept Form 3.2 Writing Equations Using a Slope and a Point 3.3 Writing Equations Using		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			I can explore real-life problems involving rates, equations, graphs, and intercepts. I can interpret and construct a linear equation using slope and intercepts.	Two Points 3.4 Solving Real-Life Problems PH COURSE 3 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph ON CORE 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions		
	8.EE.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different solutions). ***8.EE.7b*** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like	**How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?** **How can algebraic expressions and equations be used to model, analyze, and solve mathematical situations?**	I can use the sum of angle measures of a triangle to explore simple equation solving. I can use the Properties of Equality to solve one-step equations. I can use the properties of real numbers to determine the solution of a linear equation. I can simplify linear equations by using the distributive property and/or combining like terms. I can give examples of linear equations with one solution, infinitely many solutions, or no solution. I can use the properties of real numbers to determine the solution of a linear equation. I can simplify a linear equation by using the distributive property and/or combining like terms. I can give examples of linear equations with one solution, infinitely many	BIG IDEAS 1.1 Solving Simple Equations 1.2 Solving Multi-Step Equations 1.3 Solving Equations with Variables on Both Sides 1.3b Solutions to Linear Equations 1.4 Rewriting Equations and Formulas PH COURSE 3 2.1 Solving One-Step Equations 2.2 Solving Two-Step Equations 2.3 Simplifying Algebraic Expressions 2.4 Solving Multi-Step Equations 2.5 Draw a Diagram and Write an Equation ON CORE 3.1 Solving Equations 3.2 Analyzing Solutions BIG IDEAS 8.1 Writing and Graphing Inequalities 8.2 Solving Inequalities Using Addition or Subtraction 8.3 Solving Inequalities Using Multiplication or Division		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			solutions, or no solution.	8.4 Solving Multi-Step Inequalities PH COURSE 3 2.6 Solving Inequalities by Adding or Subtracting 2.7 Solving Inequalities by Multiplying or Dividing 2.8 Solving Two-Step Inequalities ON CORE 3.1 Solving Equations 3.2 Analyzing Solutions		
	8.EE.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. ***8.EE.8b*** Solve systems of two linear equations in two variable algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. ***8.EE.8c*** Solve real-world and mathematical problems leading to two linear equations in two variables.	**How are functions graphed and how are they useful?** **How are functions written and how are they solved and used?**	I can explain how a line represents the infinite number of solutions to a linear equation with two variables. I can use the graphs of two linear equations to estimate the solution of the system. I can solve real-world problems and mathematical problems dealing with systems of linear equations and interpret the solution in the context of the problem. I can explain how the point(s) of intersection of two graphs will represent the solution to the system of two linear equations because that/those point(s) are solutions to both equations. I can solve a system of linear equations by graphing. I can solve a system of linear equations by algebraically. I can write a system of linear equations and solve the system. I can solve a system of linear equations by graphing.	BIG IDEAS 2.1 Graphing Linear Equations PH COURSE 3 3.2 Graphing Equations with Two Variables ON CORE 1.1 Integer Exponents 3.3 Solving Systems Graphically 6.2 Scatter Plots and Predictions BIG IDEAS 2.5 Systems of Linear Equations 2.6 Special Systems of Linear Equations 2.7 Solving Equations by Graphing PH COURSE 3 3.7 Solving Linear Systems by Graphing ON CORE 3.3 Solving Systems Graphically 3.4 Solving Systems Algebraically BIG IDEAS 3.5 Writing Systems of Linear Equations		

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			I can solve a system of linear equations by algebraically. I can write a system of linear equations and solve the system.	PH COURSE 3 3.7 Solving Linear Systems by Graphing ON CORE 3.3 Solving Systems Graphically 3.4 Solving Systems Algebraically		

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Functions	***8.F.1*** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	**How are functions useful in making sense of patterns and solving problems involving quantitative relationships?** **How are functions useful in making sense of patterns and solving problems involving quantitative relationships?**	I can explain that a function represents a relationship between an input and an output where the output depends on the input; therefore, there can only be one output for each input. I can show the relationship between the inputs and outputs of a function by graphing them as ordered pairs on a coordinate plane. I can determine the properties of a function written in algebraic form (e.g., rate of change, meaning of y-intercept, linear, non-linear.) I can determine the properties of a function when given the inputs and outputs in a table. I can determine the properties of a function represented as a graph. I can determine the properties of a function when given the situation verbally. I can compare the properties of two functions that are represented differently (e.g., as an equation, in a table, graphically, or verbally.) I can explain why the equation y=mx+b represents a linear function and interpret the slope and y-intercept in relation to the function. I can write a linear function that models a situation given verbally as a table of x- and y-values or as a graph. I can define the initial value of the function in relation to the situation. I can define the rate of change in relation to the situation. I can define the y-intercept in relation to the situation.	<u>BIG IDEAS</u> 4.1 Domain and Range of a Function 4.2 Discrete and Continuous Domains <u>PH COURSE 3</u> 12.2 Functions 12.3 Graphing Linear Functions <u>ON CORE</u> 2.1 Functions, Tables, and Graphs 2.6 Comparing Functions <u>BIG IDEAS</u> 4.3 Linear Function Patterns <u>PH COURSE 3</u> 3.3 Understanding Slope 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph 3.6 Using Graphs of Equations 12.2 Functions 12.7 Write an Equation <u>ON CORE</u> 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions <u>BIG IDEAS</u> 4.4 Comparing Linear and Nonlinear Functions <u>PH COURSE 3</u> 3.3 Understanding Slope 12.2 Functions 12.6 Nonlinear Functions		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			I can give examples of relationships that are non-linear functions. I can analyze the rate of change between input and output values to determine if a function is linear or non-linear. I can create a table of values that can be defined as a non-linear function. I can match the graph of a function to a given situation. I can write a story that describes the functional relationship between two variables depicted on a graph. I can create a graph of a function that describes the relationship between two variables. I can explain any constraints on the domain in relation to the situation.	ON CORE 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions 2.7 Analyzing Graphs		
	8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**How are functions useful in making sense of patterns and solving problems involving quantitative relationships?** **How are functions useful in making sense of patterns and solving problems involving quantitative relationships?** **How can algebraic expressions and equations be used to model, analyze, solve mathematical situations, and make sense of the quantitative relationships?**	I can explain that a function represents a relationship between an input and an output where the output depends on the input; therefore, there can only be one output for each input. I can show the relationship between the inputs and outputs of a function by graphing them as ordered pairs on a coordinate plane. I can determine the properties of a function written in algebraic form (e.g., rate of change, meaning of y-intercept, linear, non-linear.) I can determine the properties of a function when given the inputs and outputs in a table. I can determine the properties of a function represented as a graph. I can determine the properties of a	BIG IDEAS 4.1 Domain and Range of a Function 4.2 Discrete and Continuous Domains PH COURSE 3 12.2 Functions 12.3 Graphing Linear Functions ON CORE 2.1 Functions, Tables, and Graphs 2.6 Comparing Functions BIG IDEAS 4.3 Linear Function Patterns PH COURSE 3 3.3 Understanding Slope 3.4 Using the Y-Intercept 3.5 Write an Equation and		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			function when given the situation verbally. I can compare the properties of two functions that are represented differently (e.g., as an equation, in a table, graphically, or verbally.) I can explain why the equation y=mx+b represents a linear function and interpret the slope and y-intercept in relation to the function. I can write a linear function that models a situation given verbally as a table of x- and y-values or as a graph. I can define the initial value of the function in relation to the situation. I can define the rate of change in relation to the situation. I can define the y-intercept in relation to the situation. I can explain any constraints on the domain in relation to the situation. I can give examples of relationships that are non-linear functions. I can analyze the rate of change between input and output values to determine if a function is linear or non-linear. I can create a table of values that can be defined as a non-linear function. I can match the graph of a function to a given situation. I can write a story that describes the functional relationship between two variables depicted on a graph. I can create a graph of a function that describes the relationship between two variables.	Make a Graph 3.6 Using Graphs of Equations 12.2 Functions 12.7 Write an Equation <u>ON CORE</u> 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions <u>BIG IDEAS</u> 4.4 Comparing Linear and Nonlinear Functions <u>PH COURSE 3</u> 3.3 Understanding Slope 12.2 Functions 12.6 Nonlinear Functions <u>ON CORE</u> 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions 2.7 Analyzing Graphs <u>BIG IDEAS</u> 4.4b Comparing Rates <u>PH COURSE 3</u> 3.4 Using the Y-Intercept 5.1 Ratios and Rates 5.3 Write an Equation <u>ON CORE</u> 2.2 Graphing Linear Functions 2.3 Rate of Change and Slope 2.6 Comparing Functions		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			I can analyze the rate of change between input and output values to determine if a function is linear or non-linear. I can graph a proportional relationship in the coordinate plane. I can interpret the unit rate of a proportional relationship as the slope of the graph. I can justify that the graph of a proportional relationship will always intersect the origin of the graph. I can use a graph, a table, or an equation to determine the unit rate of a proportional relationship and use the unit rate to make comparisons between various proportional relationships.			
	8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.	**How are functions useful in making sense of patterns and solving problems involving quantitative relationships?**	I can explain why the equation y=mx+b represents a linear function and interpret the slope and y-intercept in relation to the function. I can write a linear function that models a situation given verbally as a table of x- and y-values or as a graph. I can define the initial value of the function in relation to the situation. I can define the rate of change in relation to the situation. I can define the y-intercept in relation to the situation. I can explain any constraints on the domain in relation to the situation. I can give examples of relationships that are non-linear functions. I can analyze the rate of change between input and output values to determine if a function is linear or non-linear. I can create a table of values that can be	BIG IDEAS 4.3 Linear Function Patterns PH COURSE 3 3.3 Understanding Slope 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph 3.6 Using Graphs of Equations 12.2 Functions 12.7 Write an Equation ON CORE 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions BIG IDEAS 4.4 Comparing Linear and Nonlinear Functions PH COURSE 3		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			defined as a non-linear function. I can match the graph of a function to a given situation. I can write a story that describes the functional relationship between two variables depicted on a graph. I can create a graph of a function that describes the relationship between two variables.	3.3 Understanding Slope 12.2 Functions 12.6 Nonlinear Functions ON CORE 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions 2.7 Analyzing Graphs		
	8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	**How are functions written and how are they solved and used?** **How are functions useful in making sense of patterns and solving problems involving quantitative relationships?**	I can justify that an equation in the form $y = mx+b$ will represent the graph of a proportional relationship with a slope of m and a y-intercept of b I can write and justify an equation in the form $y= mx + b$ given the slope (m) and a point on the line. I can write a linear equation given two points and the rate of change between the two points. I can explore real-life problems involving rates, equations, graphs, and intercepts. I can explain why the equation y=mx+b represents a linear function and interpret the slope and y-intercept in relation to the function. I can write a linear function that models a situation given verbally as a table of x- and y-values or as a graph. I can define the initial value of the function in relation to the situation. I can define the rate of change in relation to the situation.	BIG IDEAS 3.1 Writing Equations in Slope-Intercept Form 3.2 Writing Equations Using a Slope and a Point 3.3 Writing Equations Using Two Points 3.4 Solving Real-Life Problems PH COURSE 3 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph ON CORE 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions BIG IDEAS 4.3 Linear Function Patterns PH COURSE 3 3.3 Understanding Slope 3.4 Using the Y-Intercept 3.5 Write an Equation and Make a Graph 3.6 Using Graphs of Equations 12.2 Functions 12.7 Write an Equation ON CORE		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			I can define the y-intercept in relation to the situation. I can explain any constraints on the domain in relation to the situation. I can interpret and construct a linear equation using slope and intercepts.	2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions		
	8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	**How are functions useful in making sense of patterns and solving problems involving quantitative relationships?**	I can give examples of relationships that are non-linear functions. I can analyze the rate of change between input and output values to determine if a function is linear or non-linear. I can create a table of values that can be defined as a non-linear function. I can match the graph of a function to a given situation. I can write a story that describes the functional relationship between two variables depicted on a graph. I can create a graph of a function that describes the relationship between two variables.	BIG IDEAS 4.4 Comparing Linear and Nonlinear Functions PH COURSE 3 3.3 Understanding Slope 12.2 Functions 12.6 Nonlinear Functions ON CORE 2.1 Functions, Tables, and Graphs 2.2 Graphing Linear Functions 2.4 Slope-Intercept Form 2.5 Writing Equations to Describe Functions 2.6 Comparing Functions 2.7 Analyzing Graphs		

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Geometry	***8.G.1a*** Verify experimentally the properties of rotations, reflections, and translations in which lines are taken to lines and line segments to line segments of the same length. ***8.G.1b*** Verify experimentally the properties of rotations, reflections, and translations in which angles are taken to angles the same measure. ***8.G.1c*** Verify experimentally the properties of rotations, reflections, and translations in which parallel lines are taken to parallel lines.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can verify – by measuring and comparing lengths, angle measures, and parallelism of a figure and its image – that after a figure has been translated, reflected, or rotated, corresponding lines and line segments remain the same length, corresponding angles have the same measure, and corresponding parallel lines remain parallel. I can explain how transformations can be used to prove that two figures are congruent. I can perform a series of transformations (reflections, rotations, and/or translations) to prove or disprove that two figures are congruent.	BIG IDEAS Additional Topic 1 - Transformations PH COURSE 3 3.8 Translations 3.9 Reflections and Symmetry 3.10 Rotations 5.6 Similarity Transformations ON CORE 4.2 Properties of Transformations		
	8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can verify – by measuring and comparing lengths, angle measures, and parallelism of a figure and its image – that after a figure has been translated, reflected, or rotated, corresponding lines and line segments remain the same length, corresponding angles have the same measure, and corresponding parallel lines remain parallel. I can explain how transformations can be used to prove that two figures are congruent. I can perform a series of transformations (reflections, rotations, and/or translations) to prove or disprove that two figures are congruent.	BIG IDEAS Additional Topic 1 - Transformations PH COURSE 3 3.8 Translations 3.9 Reflections and Symmetry 3.10 Rotations 5.6 Similarity Transformations ON CORE 4.2 Properties of Transformations		
	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can describe the changes occurring to the x- and y-coordinates of a figure after a translation. I can describe the changes occurring to the x- and y-coordinates of a figure after a reflection. I can describe the changes occurring to the x- and y-coordinates of a figure after	BIG IDEAS Additional Topic 1 - Transformations PH COURSE 3 3.8 Translations 3.9 Reflections and Symmetry 3.10 Rotations 5.6 Similarity		

Unit/Cluster	CCSS	Essential Questions	Learning Targets	Resources	Assessments	Notes
			a rotation. I can describe the changes occurring to the x- and y-coordinates of a figure after a dilation. I can explain how transformations can be used to prove that two figures are similar. I can describe a sequence of transformations to prove or disprove that two given figures are similar.	Transformations ON CORE 4.4 Dilations 4.5 Transformations and Similarity		
	8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can describe the changes occurring to the x- and y-coordinates of a figure after a translation. I can describe the changes occurring to the x- and y-coordinates of a figure after a reflection. I can describe the changes occurring to the x- and y-coordinates of a figure after a rotation. I can describe the changes occurring to the x- and y-coordinates of a figure after a dilation. I can explain how transformations can be used to prove that two figures are similar. I can describe a sequence of transformations to prove or disprove that two given figures are similar.	BIG IDEAS Additional Topic 1 - Transformations PH COURSE 3 3.8 Translations 3.9 Reflections and Symmetry 3.10 Rotations 5.6 Similarity Transformations ON CORE 4.4 Dilations 4.5 Transformations and Similarity		
	8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can informally prove that the sum of any triangle's interior angles will have the same measure as a straight angle (i.e., by tearing off the three corners of a triangle and arranging them to form a 180° straight angle.) I can informally prove that the sum of any polygon's exterior angles will be 360°. I can make conjectures regarding the relationships and measurements of the angles created when two parallel lines	BIG IDEAS 5.1 Classifying Angles 5.2 Angles and Sides of Triangles 5.3 Angles of Polygons 5.4 Using Similar Triangles 5.5 Parallel Lines and Transversals PH COURSE 3 8.1 Pairs of Angles 8.2 Angles and Parallel Lines 8.3 Congruent Polygons 8.5 Classifying Triangles and		

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			are cut by a transversal. I can apply proven relationships to establish minimal properties to justify similarity.	Quadrilaterals 8.6 Angles and Polygons ON CORE 5.1 Parallel Lines Cut by a Transversal 5.3 Similar Triangles		
	8.G.6 Explain a proof of the Pythagorean Theorem and its converse.		I can use visual models to demonstrate the relationship of the three side lengths of any right triangle. I can use algebraic reasoning to relate the visual model to the Pythagorean Theorem. I can use the Pythagorean Theorem to determine if a given triangle is a right triangle. I can apply the Pythagorean Theorem to find an unknown side length of a right triangle. I can draw a diagram and use the Pythagorean Theorem to solve real-world problems involving right triangles. I can draw a diagram to find right triangles in a three-dimensional figure and use the Pythagorean Theorem to calculate various dimensions. I can connect any two points on a coordinate plane to a third point so that the three points form a right triangle. I can use a right triangle and the Pythagorean Theorem to find the distance between the original two points.	BIG IDEAS 6.2 Pythagorean Theorem 6.5 Using the Pythagorean Theorem PH COURSE 3 4.9 The Pythagorean Theorem ON CORE 5.4 Similar Triangles and Slope 5.5 Using the Pythagorean Theorem 5.6 Proving the Pythagorean Theorem		
	8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.		I can use visual models to demonstrate the relationship of the three side lengths of any right triangle. I can use algebraic reasoning to relate the visual model to the Pythagorean Theorem. I can use the Pythagorean Theorem to determine if a given triangle is a right	BIG IDEAS 6.2 Pythagorean Theorem 6.5 Using the Pythagorean Theorem PH COURSE 3 4.9 The Pythagorean Theorem ON CORE		

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			triangle. I can apply the Pythagorean Theorem to find an unknown side length of a right triangle. I can draw a diagram and use the Pythagorean Theorem to solve real-world problems involving right triangles. I can draw a diagram to find right triangles in a three-dimensional figure and use the Pythagorean Theorem to calculate various dimensions. I can connect any two points on a coordinate plane to a third point so that the three points form a right triangle. I can use a right triangle and the Pythagorean Theorem to find the distance between the original two points.	5.4 Similar Triangles and Slope 5.5 Using the Pythagorean Theorem 5.6 Proving the Pythagorean Theorem		
	8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.		I can use visual models to demonstrate the relationship of the three side lengths of any right triangle. I can use algebraic reasoning to relate the visual model to the Pythagorean Theorem. I can use the Pythagorean Theorem to determine if a given triangle is a right triangle. I can apply the Pythagorean Theorem to find an unknown side length of a right triangle. I can draw a diagram and use the Pythagorean Theorem to solve real-world problems involving right triangles. I can draw a diagram to find right triangles in a three-dimensional figure and use the Pythagorean Theorem to calculate various dimensions. I can connect any two points on a coordinate plane to a third point so that	BIG IDEAS 6.2 Pythagorean Theorem 6.5 Using the Pythagorean Theorem PH COURSE 3 4.9 The Pythagorean Theorem ON CORE 5.4 Similar Triangles and Slope 5.5 Using the Pythagorean Theorem 5.6 Proving the Pythagorean Theorem		

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			the three points form a right triangle. I can use a right triangle and the Pythagorean Theorem to find the distance between the original two points.			
	8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**How does geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving?**	I can describe the similarity between finding the volume of a cylinder and the volume of a right prism. I can recall the formula to find the volume of a cylinder. I can informally prove the relationship between the volume of a cylinder and the volume of a cone with the same base. I can recall the formula to find the volume of a cone. I can informally prove the relationship between the volume of a sphere and the volume of a circumscribed cylinder. I can recall the formula to find the volume of a sphere. I can use the formulas to find the volume of cylinders, cones, and spheres. I can solve real-world problems involving the volume of cylinders, cones, and spheres.	BIG IDEAS Additional Topic 2 - Volume PH COURSE 3 9.6 Volumes of Prisms and Cones 9.7 Volumes of Pyramids and Cylinders p. 511 Extension: Formulas for Spheres ON CORE 5.7 Volume Formulas		

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Statistics and Probability	***8.SP.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 association, linear association, and nonlinear association.	**How is probability used to make informed decisions about uncertain events, and how can probability lead to more valid and reliable predictions about the likelihood of an event occurring?**	I can plot ordered pairs on a coordinate grid representing the relationship between two data sets. I can describe patterns in the plotted points such as clustering, outliers, positive or negative association, and linear or nonlinear association and describe the pattern in the context of the measurement data. I can interpret the patterns of association in the context of the data sample. I can recognize whether or not data plotted on a scatter plot have a linear association. I can draw a straight trend line to approximate the linear relationship between the plotted points of two data sets. I can make inferences regarding the reliability of the trend line by noting the closeness of the data points to the line. I can determine the equation of the trend line that approximates the linear relationship between the plotted points of two data sets. I can interpret the y-intercept of the equation in the context of the collected data. I can interpret the slope of the equation in the context of the collected data. I can use the equation of the trend line to summarize the given data and make predictions regarding additional data points.	BIG IDEAS 7.1 Measures of Central Tendency 7.2 Box-Whisker Plots 7.3 Scatter Plots and Lines of Best Fit 7.3b Two-Way Tables 7.4 Choosing a Data Display PH COURSE 3 1.6 Using Integers with Mean, Median, and Mode 10.1 Displaying Frequency 10.2 Reading Graphs Critically 10.3 Stem-and-Leaf Plots 10.4 Box-and-Whisker Plots 10.5 Making Predictions from Scatter Plots 10.7 Choosing an Appropriate Graph ON CORE 6.1 Scatter Plots and Association 6.2 Scatter Plots and Predictions 6.3 Two-Way Tables		
	8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a	**How is probability used to make informed decisions about uncertain events, and how can probability lead to more valid and reliable**	I can plot ordered pairs on a coordinate grid representing the relationship between two data sets. I can describe patterns in the plotted	BIG IDEAS 7.1 Measures of Central Tendency 7.2 Box-Whisker Plots 7.3 Scatter Plots and Lines of		

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	linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	**predictions about the likelihood of an event occurring?**	points such as clustering, outliers, positive or negative association, and linear or nonlinear association and describe the pattern in the context of the measurement data. I can interpret the patterns of association in the context of the data sample. I can recognize whether or not data plotted on a scatter plot have a linear association. I can draw a straight trend line to approximate the linear relationship between the plotted points of two data sets. I can make inferences regarding the reliability of the trend line by noting the closeness of the data points to the line. I can determine the equation of the trend line that approximates the linear relationship between the plotted points of two data sets. I can interpret the y-intercept of the equation in the context of the collected data. I can interpret the slope of the equation in the context of the collected data. I can use the equation of the trend line to summarize the given data and make predictions regarding additional data points.	Best Fit 7.3b Two-Way Tables 7.4 Choosing a Data Display PH COURSE 3 1.6 Using Integers with Mean, Median, and Mode 10.1 Displaying Frequency 10.2 Reading Graphs Critically 10.3 Stem-and-Leaf Plots 10.4 Box-and-Whisker Plots 10.5 Making Predictions from Scatter Plots 10.7 Choosing an Appropriate Graph ON CORE 6.1 Scatter Plots and Association 6.2 Scatter Plots and Predictions 6.3 Two-Way Tables		
	8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting slope and intercept.	**How are functions graphed and how are they useful?** **How is probability used to make informed decisions about uncertain events, and how can probability lead to more valid and reliable predictions about the likelihood of an event occurring?**	I can explain how a line represents the infinite number of solutions to a linear equation with two variables. I can plot ordered pairs on a coordinate grid representing the relationship between two data sets. I can describe patterns in the plotted points such as clustering, outliers, positive or negative association, and	BIG IDEAS 2.1 Graphing Linear Equations PH COURSE 3 3.2 Graphing Equations with Two Variables ON CORE 1.1 Integer Exponents 3.3 Solving Systems		

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			linear or nonlinear association and describe the pattern in the context of the measurement data. I can interpret the patterns of association in the context of the data sample. I can recognize whether or not data plotted on a scatter plot have a linear association. I can draw a straight trend line to approximate the linear relationship between the plotted points of two data sets. I can make inferences regarding the reliability of the trend line by noting the closeness of the data points to the line. I can determine the equation of the trend line that approximates the linear relationship between the plotted points of two data sets. I can interpret the y-intercept of the equation in the context of the collected data. I can interpret the slope of the equation in the context of the collected data. I can use the equation of the trend line to summarize the given data and make predictions regarding additional data points.	Graphically 6.2 Scatter Plots and Predictions BIG IDEAS 7.1 Measures of Central Tendency 7.2 Box-Whisker Plots 7.3 Scatter Plots and Lines of Best Fit 7.3b Two-Way Tables 7.4 Choosing a Data Display PH COURSE 3 1.6 Using Integers with Mean, Median, and Mode 10.1 Displaying Frequency 10.2 Reading Graphs Critically 10.3 Stem-and-Leaf Plots 10.4 Box-and-Whisker Plots 10.5 Making Predictions from Scatter Plots 10.7 Choosing an Appropriate Graph ON CORE 6.1 Scatter Plots and Association 6.2 Scatter Plots and Predictions 6.3 Two-Way Tables		
	8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. 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	**How is probability used to make informed decisions about uncertain events, and how can probability lead to more valid and reliable predictions about the likelihood of an event occurring?**	I can plot ordered pairs on a coordinate grid representing the relationship between two data sets. I can describe patterns in the plotted points such as clustering, outliers, positive or negative association, and linear or nonlinear association and describe the pattern in the context of the measurement data. I can interpret the patterns of association in the context of the data sample.	BIG IDEAS 7.1 Measures of Central Tendency 7.2 Box-Whisker Plots 7.3 Scatter Plots and Lines of Best Fit 7.3b Two-Way Tables 7.4 Choosing a Data Display PH COURSE 3 1.6 Using Integers with Mean, Median, and Mode 10.1 Displaying Frequency		

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	possible association between the two variables.		I can recognize whether or not data plotted on a scatter plot have a linear association. I can draw a straight trend line to approximate the linear relationship between the plotted points of two data sets. I can make inferences regarding the reliability of the trend line by noting the closeness of the data points to the line. I can determine the equation of the trend line that approximates the linear relationship between the plotted points of two data sets. I can interpret the y-intercept of the equation in the context of the collected data. I can interpret the slope of the equation in the context of the collected data. I can use the equation of the trend line to summarize the given data and make predictions regarding additional data points.	10.2 Reading Graphs Critically 10.3 Stem-and-Leaf Plots 10.4 Box-and-Whisker Plots 10.5 Making Predictions from Scatter Plots 10.7 Choosing an Appropriate Graph <u>ON CORE</u> 6.1 Scatter Plots and Association 6.2 Scatter Plots and Predictions 6.3 Two-Way Tables		