| Building: | **RCHS** | Course: | **Math 8** | Grade: | **8** | Tier: | **1** | Approved: | **E** Jones | **C** Troxel | **A** Lemke / Perkins |

Unit 1: The Number System ✅	Unit 2: Expressions and Equations ✅	Unit 3: Functions ✅

Priority Standard(s)
● M.8.NSA.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 use patterns to rewrite a decimal expansion that repeats into rational number:
● M.8.NS.A.2
  ○ Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expression
● M.8.EE.A.1
  ○ Know and apply the properties of integer exponents to generate equivalent numerical expressions
	Priority Standard(s)
	● M.8.EE.C.7
	  ○ Solve linear equations in one variable
	● M.8.EE.B.5
	  ○ Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
	● M.8.EE.C.8
	  ○ Analyze and solve pairs of simultaneous linear equations
	    ■ 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.
	● M.8.F.B.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 of a relationship or from two (x,y) values.
		Priority Standard(s)
		● M.8.F.A.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.
		● M.8.F.A.2
		  ○ Compare properties of two functions each represented in a different way.
		● M.8.F.A.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.

Supporting Standard(s)
● M.8.EE.A.2
  ○ Use square root and cube root symbols to represent solutions to equations of the form $x^2=p$ is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that radical 2 is irrational.
● M.8.EE.A.2
  ○ Perform operations with numbers expressed in scientific notation including problems where both decimal and scientific notation are used.
	Supporting Standard(s)
	● M.8.F.A.2
	  ○ Compare properties of two functions each represented in a different way.
	● M.8.F.A.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.
	● M.8.EE.B.6
	  ○ Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y=mx$ for a line through the origin and the equation $y=mx+b$ for a line intercepting the vertical axis at b
		Supporting Standard(s)
		● M.8.F.B.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 of a relationship or from two (x,y) values.
		● M.8.F.B.5
		  ○ Describe qualitatively the functional relationship between two quantities by analyzing a graph.

Employability Standards(s) ● To be selected later	**Employability Standards(s)** ● To be selected later	**Employability Standards(s)** ● To be selected later

Learning Outcomes

Students need to know (prior skills/knowledge)	DOK Level	Students need to know (prior skills/knowledge)	DOK Level	Students need to know (prior skills/knowledge)	DOK Level
● Positive and negative fractions ● Mixed numbers		● Write and solve one-step and two-step linear equations		● Solve and graph equations in one and two variables.	

1

- Decimals - Percents - Number Lines					

Students will learn (new content & skills)	DOK Level	Students will learn (new content & skills)	DOK Level	Students will learn (new content & skills)	DOK Level
- Students will know that there are numbers that are not rational, and approximate them by rational numbers		- Students will work with radicals and integer exponents - Students will understand the connections between proportional relationships, lines, and linear equations. - Students will analyze and solve linear equations and pairs of simultaneous equations.		- Students will define, evaluate, and compare functions. - Students will use functions to model relationships between qualities.	

Students will do (I can statements)	DOK Level	Students will do (I can statements)	DOK Level	Students will do (I can statements)	DOK Level
- I can write fractions or mixed numbers as decimals. - I can write decimals as fractions or mixed numbers in the simplest form. - I can write expressions using exponents. - I can evaluate expressions with exponents. - I can multiply and divide expressions using the laws of exponents. - I can evaluate an expression with missing exponents to find the missing number. - I can find the power of a product using the laws of exponents. - I can convert an expression with negative exponents to an expression with positive exponents. - I can write fractions as expressions with negative exponents. - I can write numbers in scientific notation and standard notation. - I can apply operations and exponents to expressions written in scientific notation. - I can evaluate square roots and cube roots. - I can solve equations using the square root property. - I can estimate square roots and cube roots to the nearest integer. - I can determine which set of numbers a real number belongs in. - I can compare numbers.		- I can solve one step linear equations with fractional coefficients. - I can solve one step linear equations with decimal coefficients. - I can solve multi step linear equations and check my solution. - I can translate verbal expressions into equations and solve. - I can determine whether relationships are linear. - I can find the constant rate of change of linear relationships. - I can find the slope of a line using two points. - I can find the constant of proportionality. - I can find missing values in proportions. - I can write equations in slope intercept form and interpret their meaning in the context of a problem. - I can graph lines in slope intercept form. - I can determine x and y intercepts and use them to graph linear equations. - I can write equations in point slope. - I can write equations in standard form. - I can solve a system of equations by graphing. - I can solve a system of equations algebraically.		- I can write linear equations that describe the relationship between two quantities. - I can express a relation as a set of ordered pairs, table, and graph. - I can determine the domain and range of a relation. - I can find a function value given a function rule and graph the results. - I can determine if data that model real-world situations are discrete or continuous by considering whether all numbers are reasonable as part of the domain. - I can compare two functions represented in different forms. - I can find the initial value of a function from graphs, words, and tables. - I can identify linear and nonlinear functions by determining if the rates of change are constant. - I can graph quadratic equations by creating a table of values. - I can create and describe the changes in qualitative graphs that represent situations that may not have numerical values.	

Domain-specific Vocabulary	Domain-specific Vocabulary	Domain-specific Vocabulary

- Base
- Cube root
- Exponent
- Irrational number
- Monomial
- Perfect cube
- Perfect square
- Power
- Radical sign
- Rational number
- Repeating decimal
- Scientific notation
- Square root
- Terminating decimals

- Coefficient
- Identity
- Multiplicative Inverse
- Null set
- Properties
- Two-step equation
- Constant of proportionality
- Constant of variation
- Constant of rate of change
- Direct variation
- Linear relationships
- Point-slope form
- Rise
- Run
- Slope
- Slope-intercept form
- Standard form
- Substitution
- Systems of equations
- X-intercept
- y-intercept

- Continuous data
- Dependent variable
- Discrete data
- Domain
- Function
- Function table
- Independent variable
- Linear equation
- Linear function
- Nonlinear function
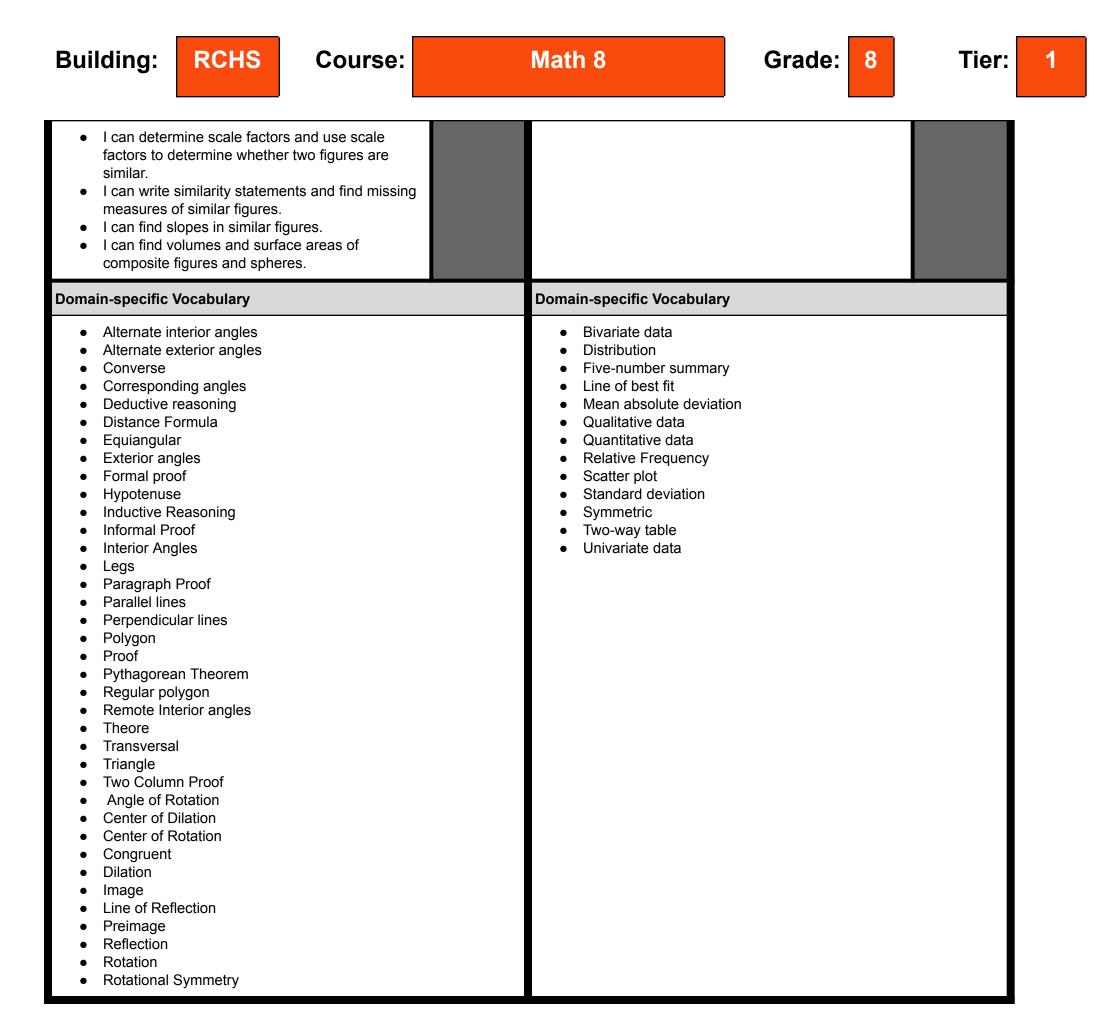- Quadratic function
- Qualitative graphs
- Range
- Relation

PLC Question #1: What do we want all students to know and be able to do?

Unit 4: Geometry ✅	Unit 5: Statistics and Probability ✅
Priority Standard(s) ● M.8.G.A.5 　○ Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle -angle criterion for similarity of triangles. ● M.8.G.B.7 　○ Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions ● M.8.G.B.8 　○ Apply Pythagorean Theorem to find the distance between two points in a coordinate system. ● M.8.G.A.3 　○ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates ● M.8.G.C.9 　○ Know the relationships among the formulas for the volumes of cones, cylinders, and spheres (given the same height and diameter) and use them to solve real-world and mathematical problems.	**Priority Standard(s)** ● M.8.SP.A.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 ● M.8.SP.A.2 　○ Know the straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line ● M.8.SP.A.4 　○ Understand that patterns of associations 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 possible association between the two variables.
Supporting Standard(s) ● M.8.G.A.1 　○ Verify experimentally the properties of rotations, reflections, and translations 　　■ Lines are taken to lines, and line segments of the same length. 　　■ Angles are taken to angles of the same measure. 　　■ Parallel lines are taken to parallel lines ● M.8.G.B.6 　○ Justify the relationship between the lengths of the legs and the length of the hypotenuse of a right triangle, and the converse of the Pythagorean theorem.	**Supporting Standard(s)** ● M.8.SP.A.3 　○ Use the equations of linear model to solve problems in the context bivariate measurement data, interpreting the slope and intercept
Employability Standards(s) ● To be selected later	**Employability Standards(s)** ● To be selected later

| Building: | **RCHS** | Course: | **Math 8** | Grade: | **8** | Tier: | **1** | Approved: | **E** Jones | **C** Troxel | **A** Lemke / Perkins |

Learning Outcomes		Learning Outcomes	
Students need to know (prior skills/knowledge)	**DOK Level**	**Students need to know (prior skills/knowledge)**	**DOK Level**
• Solve multi-step equations		• Represent relationships and functions on a coordinate plane.	
Students will learn (new content & skills)	**DOK Level**	**Students will learn (new content & skills)**	**DOK Level**
• Students will understand congruence and similarity using geometry software. • Students will understand and apply the Pythagorean Theorem • Students will solve real-world and mathematical problems involving volume of cylinders, cones and spheres.		• Students will investigate patterns of association in bivariate data	
Students will do (I can statements)	**DOK Level**	**Students will do (I can statements)**	**DOK Level**
• I can classify angles as alternate interior, alternate exterior, and corresponding. • I can find the measures of missing angles given two parallel lines cut by a transversal. • I can use inductive and deductive reasoning to complete proofs. • I can find missing measures of interior angles in triangles. • I can find missing measures of exterior angles in triangles. • I can evaluate the sum of the measures of the interior angles of a polygon. • I can find the exterior angles of all regular polygons. • I can write equations to find the missing sides of right triangles. • I can determine whether a triangle is a right triangle given the side lengths. • I can find the distance between points on a coordinate grid. • I can translate images on a coordinate grid. • I can reflect images over an axis on a coordinate grid. • I can rotate an image around a point on a coordinate grid. • I can dilate an image on a coordinate grid. • I can determine if two figures are congruent by using transformations. • I can write congruence statements and compare corresponding parts.		• I can construct a scatter plot and interpret the data it shows. • I can make conjectures about data. • I can create an equation based on a line that best fits data in a scatter plot and use the equation to make a prediction. • I can make two way tables to summarize data. • I can interpret relative frequencies in data. • I can find mean, median, mode, and range given a data set. • I can create a box plot with data.	

- I can determine scale factors and use scale factors to determine whether two figures are similar.
- I can write similarity statements and find missing measures of similar figures.
- I can find slopes in similar figures.
- I can find volumes and surface areas of composite figures and spheres.

Domain-specific Vocabulary	**Domain-specific Vocabulary**
- Alternate interior angles - Alternate exterior angles - Converse - Corresponding angles - Deductive reasoning - Distance Formula - Equiangular - Exterior angles - Formal proof - Hypotenuse - Inductive Reasoning - Informal Proof - Interior Angles - Legs - Paragraph Proof - Parallel lines - Perpendicular lines - Polygon - Proof - Pythagorean Theorem - Regular polygon - Remote Interior angles - Theore - Transversal - Triangle - Two Column Proof - Angle of Rotation - Center of Dilation - Center of Rotation - Congruent - Dilation - Image - Line of Reflection - Preimage - Reflection - Rotation - Rotational Symmetry	- Bivariate data - Distribution - Five-number summary - Line of best fit - Mean absolute deviation - Qualitative data - Quantitative data - Relative Frequency - Scatter plot - Standard deviation - Symmetric - Two-way table - Univariate data

- Transformation
- Translation
- Composition of transformations
- Corresponding parts
- Indirect measurement
- Scale Factor
- Similar
- Similar Polygons
- Composite Solids
- Cone
- Cylinder
- Hemisphere
- Lateral Area
- Nets
- Polyhedron
- Similar Solids
- Sphere
- Total Surface Area
- Volume

Building: RCHS **Course:** Math 8 **Grade:** 8 **Tier:** 1 **Approved:** E (Jones) C (Troxel) A (Lemke / Perkins)