HENRY COUNTY SCHOOLS

EIGHTH GRADE PLANNING GUIDE

OFFICE OF MATHEMATICS

2017 - 2018

8th Grade Spaced Instructional Review Planning Sheet
Henry County Schools-Office of Mathematics
2017 - 2018

Block of Time (6 weeks)	Big Ideas Covered (or specific skills)	Problematic Areas	Problematic Areas Targeted for SIR	Date & Instructional Time Allotted • 55-60 min. classes allot 10-15 minutes • 90 min. classes allot 30 minutes
July 31 - September 8, 2017	• Shapes can be moved in a plane or in space to make congruent or similar shapes. These transformations include translations, reflections, rotations, and dilations. • Shapes can be described in terms of their location in a plane or in space. Coordinate systems can be used to describe these locations precisely. Coordinates can be used to measure distance, an important application of the Pythagorean Theorem. • The ability to perceive shapes from different viewpoints helps us understand relationships between two- and three-dimensional figures and mentally change the position and size of shapes.	• Understanding that parallel lines cut by a transversal produce various types of angles (i.e: alternate interior/exterior, corresponding, etc.) • Understanding the criterion that produces angle-angle similarity relationships are it relates to triangles. • Understanding the transformations of two- and three-dimensional figures that produce congruence & similarity.	• Understanding that parallel lines cut by a transversal produce various types of angles (i.e: alternate interior/exterior, corresponding, etc.) • Understanding the criterion that produces angle-angle similarity relationships are it relates to triangles. • Understanding the transformations of two- and three-dimensional figures that produce congruence and similarity.	**September 11, 2017**

pjr146@psu.edu

Notes: Use assessment data from Teacher assessments (formal & informal), Progress Monitoring data sources, State Assessments, and other sources of information (teacher's experience). Table abbreviated for space considerations.

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September 11 - October 27, 2017	• Exponential Notation is a way to express repeated products of the same number. • Many numbers are not rational; the irrationals can be expressed only symbolically or approximately by using a close rational number. • Linear equations in one variable can have one solution, infinitely many solutions, or no solutions	• Understanding the concept of Exponential Notation as repeated multiplication. • Understanding the concept of irrational numbers (graphing them on the number line by using a close rational number). • Students struggle with estimating the square root if they are not given perfect squares.	• Understanding the concept of Exponential Notation as repeated multiplication. • Understanding the concept of irrational numbers. (graphing them on the number line by using a close rational number)	**October 30, 2017**
October 30 - December 22, 2017	• The Pythagorean Theorem can be used both algebraically and geometrically to solve problems involving right triangles. • Coordinates can be used to measure distance, an important application of the Pythagorean theorem • Square numbers and cubic numbers can be built from squares and cubes. • These square and cubic numbers have roots that are equal to any dimension on the square or cu • Relationships between change in length of radius or diameter, height, and volume exist for cylinders, cones and spheres.	• Students may know the Pythagorean Theorem, but struggle on working through solving; especially if given one leg and the hypotenuse but they need to find the missing leg. • Students struggle with estimating the square root if they are not given perfect squares. • Explain a proof of the Pythagorean Theorem and its converse. • Apply formulas for the volume of cones, cylinders, and spheres.	• Students may know the Pythagorean Theorem, but struggle on working through solving; especially if given one leg and the hypotenuse but they need to find the missing leg. • Apply formulas for the volume of cones, cylinders, and spheres.	**December 11, 2017**

pjr146@psu.edu

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January 9 - February 2, 2018	• A function is a specific type of relationship in which each input has a unique output. • A function can be represented in an input-output table, graphically (using ordered pairs that consist of the input and the output of the function in the form (input, output), and with an algebraic rule • Patterns and relationships can be represented graphically, numerically, and symbolically.	• Understanding that a function is a relationship with one input to one output. • Creating the algebraic rules for a function. • Patterns can be represented numerically and symbolically	• Understanding that a function is a relationship with one input to one output. • Creating the algebraic rules for a function. • Patterns can be represented numerically and symbolically.	**February 5, 2018**
February 5 - March 2, 2018 (Units 5&6)	• Linear functions may be used to represent and generalize real situations. • Slope and y-intercept are keys to solving real problems involving linear relationships. • Collecting and examining data can sometimes help one discover patterns in the ways in which two quantities vary. • Changes in varying quantities are often related by patterns, which, once discovered, can be used to predict outcomes and solve problems.	• Slope and y-intercept are keys to solving real problems involving linear relationships. • Collecting and examining data can sometimes help one discover patterns in the ways in which two quantities vary • Changes in varying quantities are often related by patterns, which once discovered, can be used to predict outcomes and solve problems.	• Slope and y-intercept are keys to solving real problems involving linear relationships. • Collecting and examining data can sometimes help one discover patterns in the ways in which two quantities vary • Changes in varying quantities are often related by patterns, which once discovered, can be used to predict outcomes and solve problems.	**March 5, 2018**

pjr146@psu.edu

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March 5 - April 13, 2018	• There are situations that require two or more equations to be satisfied simultaneously. • Solutions to systems can be interpreted algebraically, geometrically, and in terms of problem contexts. • The number of solutions to a system of equations can vary from no solution to an infinite number of solutions.	• How to correctly do system of equations. • Interpreting the meaning of one solution, no solution, or many solutions for a system of equations.	• How to correctly do system of equations. • Interpreting the meaning of one solution, no solution, or many solutions for a system of equations.	**April 9, 2018**

pjr146@psu.edu

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HCS 8th - Teacher Pace with SLOT Day

JULY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24 PRE-PLANNING	25 PRE-PLANNING	26 PRE-PLANNING	27 PRE-PLANNING	28 PRE-PLANNING	29
30	31 Unit 1	Notes:		SLOT DAY: 1 hour class: 15 min 90 min class: 30 min		

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HCS 8th - Teacher Pace with SLOT Day

AUGUST 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Unit 1: Transformation, Congruence and Similarity				
6	7	8	9	10	11	12
	Unit 1: Transformations, Congruence and Similarity					
13	14	15	16	17	18	19
	Unit 1: Transformations, Congruence and Similarity					
20	21	22	23	24	25	26
	Unit 1: Transformations, Congruence and Similarity					
27	28	29	30	31		
	Unit 1: Transformations, Congruence and Similarity					
		Notes:			SLOT DAY: 1 hour class: 15 min 90 min class: 30 min	

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HCS 8th - Teacher Pace with SLOT Day

SEPTEMBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Unit 1	2
3	4 LABOR DAY	5 Unit 1: Transformations, Congruence and Similarity	6	7	8	9
10	11 SLOT	12 Unit 2: Exponents	13	14	15	16
17	18 FALL BREAK	19 FALL BREAK	20 FALL BREAK	21 FALL BREAK	22 FALL BREAK	23
24	25 Unit 2: Exponents	26	27	28	29	30
		Notes:			SLOT DAY: 1 hour class: 15 min 90 min class: 30 min	

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HCS (Type Grade Level/Course Here) - Teacher Pace with SLOT Day

OCTOBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
	Unit 2: Exponents					
8	9	10	11	12	13	14
	Unit 2: Exponents					
15	16 PD DAY	17	18	19	20	21
		Unit 2: Exponents				
22	23	24	25	26	27	28
	Unit 2: Exponents					
29	30 SLOT Unit 3	31				
		Notes:			SLOT DAY: 1 hour class: 15 min 90 min class: 30 min	

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HCS 8th - Teacher Pace with SLOT Day

NOVEMBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
			Unit 3: Geometric Applications of Exponents			
5	6 PD DAY	7 PD DAY	8	9	10	11
			Unit 3: Geometric Applications of Exponents			
12	13	14	15	16	17	18
	Unit 3: Geometric Applications of Exponents					
19	20 THANKSGIVING BREAK	21 THANKSGIVING BREAK	22 THANKSGIVING BREAK	23 THANKSGIVING BREAK	24 THANKSGIVING BREAK	25
26	27	28	29	30		
	Unit 3: Geometric Applications of Exponents					
		Notes:		SLOT DAY: 1 hour class: 15 min 90 min class: 30 min		

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HCS 8th - Teacher Pace with SLOT Day

DECEMBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Unit 3	2
3	4 Unit 3: Geometric Application of Exponents	5	6	7	8	9
10	11 SLOT	12 Unit 3: Geometric Applications of Exponents	13	14	15	16
17	18 Unit 3: Geometric Applications of Exponents	19	20	21	22	23
24	25 SEMESTER BREAK	26 SEMESTER BREAK	27 SEMESTER BREAK	28 SEMESTER BREAK	29 SEMESTER BREAK	30
31		Notes:			SLOT DAY: 1 hour class: 15 min 90 min class: 30 min	

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HCS 8th - Teacher Pace with SLOT Day

JANUARY 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 SEMESTER BREAK	2 SEMESTER BREAK	3 SEMESTER BREAK	4 SEMESTER BREAK	5 SEMESTER BREAK	6
7	8 PD DAY	9 Unit 4: Functions	10 Unit 4: Functions	11 Unit 4: Functions	12 Unit 4: Functions	13
14	15 MLK DAY	16 Unit 4: Functions	17 Unit 4: Functions	18 Unit 4: Functions	19 Unit 4: Functions	20
21	22 Unit 4: Functions	23 Unit 4: Functions	24 Unit 4: Functions	25 Unit 4: Functions	26 Unit 4: Functions	27
28	29 Unit 4: Functions	30 Unit 4: Functions	31 Unit 4: Functions			

Notes:

SLOT DAY:
1 hour class: 15 min
90 min class: 30 min

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HCS 8th - Teacher Pace with SLOT Day

FEBRUARY 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
				Unit 4: Functions		
4	5	6	7	8	9	10
	SLOT	Units 5 & 6: Linear Functions, Models and Tables				
11	12	13	14	15	16	17
	Units 5&6: Linear Functions, Models and Tables					
18	19 WINTER BREAK	20 WINTER BREAK	21 WINTER BREAK	22 WINTER BREAK	23 WINTER BREAK	24
25	26 PD DAY	27	28			
		Units 5&6: Linear Functions, Models and Tables				
		Notes:		SLOT DAY: 1 hour class: 15 min 90 min class: 30 min		
		Units 5 & 6 should be integrated throughout instruction				

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HCS 8th - Teacher Pace with SLOT Day

MARCH 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Units 5&6: Linear Functions, Models and Tables

SLOT

Unit 7: Systems of Equations

PD DAY

Unit 7: Systems of Equations

Unit 7: Systems of Equations

Unit 7: Systems of Equations

Notes:

SLOT DAY:
1 hour class: 15 min
90 min class: 30 min

Units 5 & 6 should be integrated throughout instruction

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HCS 8th - Teacher Pace with SLOT Day

APRIL 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 SPRING BREAK	3 SPRING BREAK	4 SPRING BREAK	5 SPRING BREAK	6 SPRING BREAK	7
8	9 SLOT	10 Unit 7: Systems of Equations	11	12	13	14
15	16 Unit 7: Systems of Equations	17	18	19	20	21
22	23 Unit 7: Systems of Equations	24	25	26	27	28
29	30 Unit 7					
		Notes:		SLOT DAY: 1 hour class: 15 min 90 min class: 30 min		

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HCS 8th - Teacher Pace with SLOT Day

MAY 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Unit 7: Systems of Equations				
6	7	8	9	10	11	12
	Unit 7: Systems of Equations					
13	14	15	16	17	18	19
	Unit 7: Systems of Equations					
20	21	22	23	24	25	26
	SLOT Unit 7: Systems of Equations					
27	28 MEMORIAL DAY	29 POST-PLANNING	30 POST-PLANNING	31		
		Notes:		SLOT DAY: 1 hour class: 15 min 90 min class: 30 min		

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Academic Calendar Template

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8th Grade Vertical Map for Competency Based Learning

Henry County Schools – Office of Mathematics

2017 – 2018

Competency 1 – Standards of Mathematical Practice

The student uses mathematical practices to help make sense of the real world. The student can identify variables, formulate a model describing a relationship between the variables, interpret results, and validate and report conclusions and the reasoning behind them.

Performance Indicator	6th Grade	7th Grade	8th Grade
C1.PI1 Students can make sense of problems and persevere in solving them.	✓	✓	✓
C1.PI2 Students can reason abstractly and quantitatively.	✓	✓	✓
C1.PI3 Students can construct viable arguments and critique the reasoning of others.	✓	✓	✓
C1.PI4 Students can model with mathematics.	✓	✓	✓
C1.PI5 Students can use appropriate tools strategically.	✓	✓	✓
C1.PI6 Students can attend to precision.	✓	✓	✓
C1.PI7 Students can look for and make use of structure.	✓	✓	✓
C1.PI8 Students can look for and express regularity in repeated reasoning.	✓	✓	✓

Competency 2 – Numbers and Number Systems

The student reasons, describes and analyzes quantitatively using units and number systems to make sense of and solve problems.

Performance Indicator	6th Grade	7th Grade	8th Grade
C2.PIa Understand and analyze ratio concepts and use ratio reasoning to solve problems.	✓	✓	
C2.PIb Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	✓		
C2.PIc Compute fluently with multi- digit numbers and find common factors and multiples.	✓		
C2.PId Apply and extend previous understandings of numbers to the system of rational numbers.	✓		
C2.PIe Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	✓	✓	
C2.PIf Know that there are numbers that are not rational, and approximate them by rational numbers.			✓

Competency 3 – Algebraic Structures
The student creates, interprets, uses, and analyzes patterns of algebraic structures to make sense of problems.

Performance Indicator	6th Grade	7th Grade	8th Grade
C3.PIa Apply and extend previous understandings of arithmetic to algebraic expressions.	✓	✓	
C3.PIb Reason about and solve one- variable equations and inequalities.	✓	✓	✓
C3.PIc Represent and analyze quantitative relationships between dependent and independent variables	✓	✓	✓
C3.PId Use properties of operations to generate equivalent expressions.	✓	✓	✓
C3.PIe Solve real- life and mathematical problems using numerical and algebraic expressions and equations.	✓	✓	✓
C3.PIf Solve problems with radicals and/or integer exponents.	✓		✓
C3.PIg Understand the connections between proportional relationships, lines, and linear equations.		✓	✓
C3.PIh Analyze and solve linear equations and pairs of simultaneous linear equations.		✓	✓
C3.PIi Analyze proportional relationships and use them to solve real- world and mathematical problems.	✓	✓	✓

Competency 4 – Functions
The student uses functions to interpret and analyze a variety of contexts. Functions describe situations where one quantity determines another.

Performance Indicator	6th Grade	7th Grade	8th Grade
C4.PIa The student can define, evaluate, and compare functions			✓
C4.PIb The student can use functions to model relationships between quantities.	✓	✓	✓

Competency 5 – Geometry
The student proves, understands, and models geometric concepts using appropriate tools, theorems and constructions to solve problems and apply logical reasoning.

Performance Indicator	6th Grade	7th Grade	8th Grade
C5.PIa The student can solve real-world and mathematical problems involving angle measure, area, surface area, and volume	✓	✓	✓
C5.PIb The students can draw, construct and describe geometrical figures and describe the relationships between them.	✓	✓	✓
C5.PIc Understand congruence and similarity using physical models, transparencies, or geometry software.			✓
C5.PId Understand and apply the Pythagorean Theorem.	✓	✓	✓
C5.PIe Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.			✓

Competency 6 – Statistics and Probability
The student uses a variety of data analysis and statistics strategies to analyze, develop and evaluate inferences based on data.

Performance Indicator	6th Grade	7th Grade	8th Grade
C6.PIa The students can develop understanding of statistical variability..	✓		
C6.PIb The student can summarize and describe distributions.	✓		
C6.PIc The student can use random sampling to draw inferences about a population.		✓	
C6.PId The student can draw informal comparative inferences about two populations.		✓	
C6.PIe The student can investigate chance processes and develop, use, and evaluate probability models.	✓	✓	✓
C6.PIf The student can investigate patterns of association in bivariate data.			✓

Eighth Grade Map for Competency Based Learning

Henry County Schools – Office of Mathematics

2017 – 2018

Grade Span: 6-8 Competencies	Unit 1: Transformations, Congruence and Similarity Activities	Unit 2: Exponents Activities	Unit 3: Geometric Applications of Exponents Activities	Unit 4: Functions Activities	Unit 5: Linear Functions Activities	Unit 6: Linear Models and Tables Activities	Unit 7: Solving Systems of Equations Activities
Competency 1: Standards for Mathematical Practices.	District Benchmark Codes for Illuminate: **(Pre): 27629 (Post): 27646** OR State Frameworks Culminating Task **"Sheldon's Shelving Suggestions" (pgs. 110-119)**	District Benchmark Codes for Illuminate: **(Pre): 27631 (Post): 27648** OR State Frameworks Culminating Task **"Integer Exponents & Scientific Notation" (Pgs. 103-105)**	District Benchmark Codes for Illuminate: **(Pre): 27634 (Post): 27650** OR State Frameworks Task (**Teacher's Choice**)	District Benchmark Codes for Illuminate: **(Pre): 27636 (Post): 27653** OR State Frameworks Culminating Task **"Sorting Functions" (pgs.74-76)**	District Benchmark Codes for Illuminate: **(Pre): 27638 (Post): 27654** OR State Frameworks Culminating Task **"Filling the Tank" (pgs. 63-71)**	District Benchmark Codes for Illuminate: **(Pre): 27640 (Post): 27657** OR State Frameworks Culminating Task **"Is the Data Linear?" (pgs. 192-201)**	District Benchmark Codes for Illuminate: **(Pre): 27640 (Post): 27657** OR State Frameworks Culminating Task **"Stained Glass Windows" (pgs. 97-107)**
C1.PI1 Students can make sense of problems and persevere in solving them.	Identify a sequence of transformations on a pre-image.	Explain the relationship between rational and irrational numbers.	Solve real-world problems involving volume, Pythagorean Theorem and distance.	Question and identify whether a relation is a function or not.	Identify whether a relation is a function or not, and derive the equation in the appropriate form.	Develop and model relationships between quantities.	Make applications of solving systems of equations to real-world scenarios.
C1.PI2 Students can reason abstractly and quantitatively.	Identify the type(s) of transformation performed.	Estimate radicals.	Using equations to solve for missing triangle sides, and volume.	Make sense of quantities and relationships when defining, evaluating, and comparing functions.	Make sense of quantities and relationships between independent/dependent variables when defining, evaluating, and comparing functions.	Make sense of quantities and relationships between independent/dependent variables when modeling functional relationships and investigating patterns of bivariate data.	Solve for one, no, or many solutions and interpret their meaning.

C1.PI3 Students can construct viable arguments and critique the reasoning of others.	Explain the rule for a transformation from a graph or notation.	Explain why the inverse of exponents is the *n*th root, and vice versa.	Construct arguments using concrete referents such as objects, drawing, diagrams, and actions.	Justify conjectures based on definitions, evaluations, and comparisons of functions.	Analyze, define, evaluate, and compare functions with examples and counterexamples.	Reason inductively about data relationships between quantities.	Explain why the characteristics of the systems may predict the solution(s).
C1.PI4 Students can model with mathematics.	Perform transformations or sequences of transformations.	Show using a factor tree, number line, etc., exponents and roots.	Identify, analyze, and construct models of Pythagorean Theorem, volume, and integer exponents.	Use diagrams, tables, graphs, flowcharts, and formulas to define, evaluate, and compare functions.	Use diagrams, tables, graphs, flowcharts, and formulas to define, evaluate, compare, and analyze functional relationships.	Use diagrams, tables, graphs, flowcharts, and formulas to evaluate, compare, and investigate data patterns and relationships.	Solve systems of equations by substitution, elimination, or graphing methods.
C1.PI5 Students can use appropriate tools strategically.	Use the Cartesian plane or a geometric software to manipulate transformations.	Use a calculator to find the solution.	Use appropriate tools and/or geometric software to solve volume, Pythagorean Theorem, and problems with integer exponents.	Use appropriate tools and/or geometric software to define, evaluate, and compare functions.	Use appropriate tools and/or geometric software to define, evaluate, compare, and analyze functional relationships.	Use appropriate tools and/or geometric software to evaluate, compare, and investigate data patterns and functional relationships.	Use the Cartesian plane and/or a geometric software to graph the systems.
C1.PI6 Students can attend to precision.	Use appropriate academic language and notation to describe or write transformations.	Estimate radicals to the nearest decimal place.	Calculate accurately and efficiently with a degree of precision appropriate for the problem context.	Communicate precisely when defining, evaluating, and comparing functions.	Communicate precisely when defining, evaluating, comparing, and analyzing functions.	Communicate precisely when evaluating, comparing, and investigating data patterns and functional relationships.	Show solution using the appropriate notation (i.e., set or interval)
C1.PI7 Students can look for and make use of structure.	Discover the relationship between angle measures both clockwise and counterclockwise.	Manipulate various forms or rational numbers.	Discern patterns and structures within the Pythagorean Theorem; understand that volume and integer exponents are composed of other concepts.	Discern patterns and structures in functions.	Discern patterns and structures in functional relationships and variables (independent and dependent).	Discern patterns, structures, and associations in functional relationships and bivariate data.	Recognize where the steps overlap when solving the systems of equations.
C1.PI8 Students can look for and express	Develop the rule for each transformation.	Express numbers in scientific notation.	Look for general methods for the Pythagorean	Look for general methods, shortcuts, and attend to details	Attend to details and look for general methods, when	Attend to details, look for general methods, and	Attend to details and evaluate the reasonableness of

regularity in repeated reasoning.			Theorem, volume and integer exponents.	when comparing functions.	comparing functions and analyzing relationships between variables.	shortcuts when modeling functional relationships and investigating patterns in bivariate data.	immediate results when solving real-life algebraic expressions and linear equations.
Competency 2: Number and Number Systems							
C2.PIf Know that there are numbers that are not rational, and approximate them by rational numbers.		Find the square root of numbers and approximate their values in comparison to perfect square roots.					
Competency 3: Algebra and Algebraic Thinking							
C3.PIb Reason about and solve one-variable equations and inequalities.		Solve multi-step one-variable linear equations, with variables on both sides of the equation.					
C3.PIc Represent and analyze quantitative relationships between dependent and independent variables					Interpret the unit rate of a graph as the slope of a line in real-world problem		
C3.PId Use properties of operations to generate equivalent expressions.		Know and apply the properties of integer exponents to generate equivalent numerical expressions					
C3.PIe Solve real-life and mathematical							Explain how the point of intersection represents the

problems using numerical and algebraic expressions and equations.							solution for two linear equation
C3.PIf Solve problems with radicals and/or integer exponents.		Understand how to simplify exponents and estimating square roots.	Use exponents, square roots, and cube roots to solve real-world situations				
C3.PIg Understand the connections between proportional relationships, lines, and linear equations.		Solve multi-step one-variable linear equations, with variables on both sides of the equation (w/rational coefficient).					
C3.PIh Analyze and solve linear equations and pairs of simultaneous linear equations.							Recognize the solution of a system of equations by reading a graph of two linear equations and locating the point of intersection.
C3.PIi Analyze proportional relationships and use them to solve real-world and mathematical problems.							Examine real-world problems and create linear systems of equations.
Competency 4: Functions							
C4.PIa The student can define, evaluate, and compare functions				Identify and prove functions that are linear and nonlinear.	Compare two functions represented differently (algebraically, graphically, numerically in tables, or by verbal		

					description).		
C4.PIb The student can use functions to model relationships between quantities.						Construct a linear function to determine the slope and y-intercept from a graph and table.	
Competency 5: Geometry							
C5.PIa The student can solve real-world and mathematical problems involving angle measure, area, surface area, and volume	Students will be able to explore and justify relationships that exist between angles created when parallel lines are cut by a transversal.						
C5.PIb The students can draw, construct and describe geometrical figures and describe the relationships between them.	Students will be able to construct various triangles and find the measures of interior and exterior angles.						
C5.PIc Understand congruence and similarity using physical models, transparencies, or geometry software.	Create a figure congruent to a given figure by applying knowledge of reflection, rotation, and translation.						
C5.PId Understand and apply the Pythagorean Theorem.			Use the Pythagorean Theorem to find the missing side of a right triangle.				
C5.PIe Solve real-world and mathematical problems involving volume of cylinders,			Use appropriate formulas for volume of cones, cylinders, and spheres in mathematical and real-world situations				

cones and spheres.			.				
Competency 6: Statistics and Probability							
C6.PIf The student can investigate patterns of association in bivariate data.						Construct a graph based on information given and make predictions and analyze the data between the variables in the two-way table.	

8th Grade Performance Indicators at a Glance
Henry County Schools – Office of Mathematics
2017 – 2018

Competency 1

1 Make sense of problems and persevere in solving them. **2** Reason abstractly and quantitatively. **3** Construct viable arguments and critique the reasoning of others. **4** Model with mathematics	**5** Use appropriate tools strategically. **6** Attend to precision. **7** Look for and make use of structure. **8** Look for and express regularity in repeated reasoning.

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Transformations, Congruence and Similarity	**Exponents**	**Geometric Applications of Exponents**	**Functions**	**Linear Functions**	**Linear Models and Tables**	**Solving Systems of Equations**
C5.PIa C5.PIb C5.PIc	C2.PIf C3.PIb C3.PId C3.PIf C3.PIg	C3.PIf C5.PId C5.PIe	C4.PI a	C3.PI c C4.PI a	C4.PI b C6.PI f	C3.Pie C3.PIh C3.PIi

These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.
All units will include the Mathematical Practices and indicate skills to maintain. However, the progression of the units is at the discretion of districts.

8th Grade Performance Indicators at a Glance
Henry County Schools – Office of Mathematics
2017 – 2018

Competency 1

1 Make sense of problems and persevere in solving them. **2** Reason abstractly and quantitatively. **3** Construct viable arguments and critique the reasoning of others. **4** Model with mathematics.	**5** Use appropriate tools strategically. **6** Attend to precision. **7** Look for and make use of structure. **8** Look for and express regularity in repeated reasoning.

Performance Indicators

Unit 1

Transformations, Congruence and Similarity

C5.PIa The student can solve real-world and mathematical problems involving angle measure, area, surface area, and volume.

Learning Targets:

- I can solve real-world and mathematical problems involving angle measures.
- I can determine the relationship between two angles when given parallel lines and a transversal.

Resources:

- Desmos Introduction Activity
- GSE Frameworks-Sheldon's Shelving Suggestions (pg 110-118)

C5.PIb The student can draw, construct and describe geometrical figures and describe the relationships between them.

Learning Targets:

- I can draw, construct and describe geometrical figures and describe the relationships between them.
- I can describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates

Resources:

- Blue Dot Red Dot Activity
- Des-Patterns

Unit 2

Exponents

C3.PIb The student can reason about and solve one- variable equations and inequalities.

Learning Targets:

- I can reason about and solve one- variable equations and inequalities.
- I can give examples of one variable linear equations with one, no or infinite solutions.

Resources:

- GSE Frameworks-Writing for a Math Website (pg 96-102)
- Georgia Virtual Learning Solving Linear Equations

C3.PId The student can use properties of operations to generate equivalent expressions.

Learning Targets:

- I can apply the properties of integer exponents.
- I can use properties of operations to generate equivalent numerical expressions.

Resources:

- GSE Frameworks-Alien Attack (pg 44-51)
- Estimation 180 Exponent Mistakes

- Function Transformations: Practice with Symbols

C5.PIc The students can understand congruence and similarity using physical models, transparencies, or geometry software.

Learning Targets:

- I can understand congruence and similarity using physical models, transparencies, or geometry software.
- I can justify the process of transformations as well as the conclusion.
- I can describe the sequence of transformations from one figure to another.
- I can use informal arguments to establish facts about the angle sum and exterior angle of triangles.
- I can use informal arguments to establish facts about the angles created when parallel lines are cut by a transversal.
- I can use informal arguments to establish facts about the angle-angle criterion for similar triangles.

Resources:

- Shape Mod
- Identifying Transformed Functions: Card Sort

C3.PIf The student can work with radicals and integer exponents.

Learning Targets:

- I can use square root and cube root symbols to represent solutions to equations.
- I can evaluate square roots of perfect squares and cube roots of perfect cubes.

Resources:

- Ants Versus Humans
- Extending the Definition of Exponents
- Raising to the Zero & Negative Powers

C3.PIg The student understands the connections between proportional relationships, lines, and linear equations.

Learning Targets:

- I can understand the connections between lines and linear equations.
- I can solve linear equations in one variable.
- I can give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.
- I can solve linear equations with rational number coefficients.
- I can solve linear equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Resources:

- GSE Frameworks-Solving Linear Equations in One Variable (pg 93-95)
- Illustrative Mathematics Stuffing Envelopes

C2.PIf The student knows there are numbers that are not rational, and approximates them by rational numbers.

Learning Targets:

- I can distinguish between rational and irrational numbers.
- I can analyze and generate patterns and structure of repeating decimals.
- I can estimate, compare, and locate the value of irrational numbers on a number line.

Resources:

- GSE Frameworks-Exploring Powers of 10 (pg. 62-72)
- Open Math Negative Exponents- Closest to Zero

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Performance Indicators

Unit 3

Geometric Applications of Exponents

C5.PId The student can understand and apply the Pythagorean Theorem

Learning Targets:

- I can explain a proof of the Pythagorean Theorem.
- I can understand and apply the Pythagorean Theorem to determine unknown side lengths in right triangles.
- I can understand and apply the Pythagorean Theorem in real-world and mathematical problems in two and three dimensions.

Resources:

- Hands on Exploration of the Pythagorean Theorem.
- GSE Frameworks-Comparing TV's (pg 66-74)

C5.PIe The student can solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

Learning Targets:

- I can apply the formulas for the volume of cones, cylinders, and spheres.
- I can solve real-world and mathematical problems involving the volume of cylinders, cones and spheres.

Resources:

- GSE Frameworks-Comparing Spheres and Cylinders (pg. 115-121)
- Georgia Virtual Learning Geometric Application of Exponents

Unit 4

Functions

C4.PIa The student can define, evaluate, and compare functions.

Learning Targets:

- I can identify a function (i.e. algebraically, graphically, numerically, and by verbal description).
- I can define a function.
- I can evaluate functions.
- I can compare properties of functions, represented in different ways (i.e. algebraically, graphically, numerically in tables, and/or by verbal description.

Resources:

- GSE Frameworks-Battery Charging (pg 59-64)
- BuzzMath Comparing Functions

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Performance Indicators

Unit 5

Linear Functions

C3.PIc The student can represent and analyze quantitative relationships between dependent and independent variables.

Learning Targets:

- I can graph proportional relationships, interpreting the unit rate as the slope of the graph.
- I can compare two different proportional relationships represented in different ways.
- I can 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.
- I can 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.

Resources:

- GSE Frameworks-By the Book (pg 22-40)
- Georgia Virtual Learning Linear Functions.

C4.PIa The student can define, evaluate, and compare functions

Learning Targets:

- I can interpret the equation y=mx+b as defining a linear function.
- I can give examples of functions that are not linear.

Resources:

- GSE Frameworks-Analyzing Linear Functions (pg 57-60)
- Linear Function Sort

Unit 6

Linear Models and Tables

C4.PIb The student can use functions to model relationships between quantities.

Learning Targets:

- I can construct a function to model a linear relationship between two quantities.
- I can determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values.
- I can 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 tale of values.
- I can describe the functional relationship between two quantities by analyzing a graph--where the function is increasing or decreasing; linear or nonlinear.
- I can sketch a graph that shows the qualitative features of a function that has been described verbally.

Resources:

- GSE Frameworks-Sugar Prices (pg 12-14)
- Learnzillion Determining the constant rate of change

C6.PIf The student can investigate patterns of association in bivariate data.

Learning Targets:

- I can investigate patterns of association between two quantities.
- I can construct and interpret scatter plots for bivariate measurement data.
- I can describe clustering, outliers, positive or negative association, linear association, and nonlinear association patterns.

	● I can model relationships between two quantitative variables using straight lines. ● I can assess the model fit for a scatter plot that suggests a linear association by judging the closeness of the data points to the line. **Resources:** ● GSE Frameworks- Walking Race and Making Money (pg 96-120) ● Do teams that spend a lot win a lot?

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Performance Indicators

Unit 7

Solving Systems of Equations

C3.PIe The student can solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Learning Targets:

- I can solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- I can solve real-world problems algebraically or by inspection.

Resources:

- GSE Frameworks-Cara's Candles (pg 23-30)
- Desmos Wafers and Creme

C3.PIh The student can analyze and solve linear equations and pairs of simultaneous linear equations.

Learning Targets:

- I can solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- I can analyze and solve systems of linear equations using substitution, graphing, and/or elimination.

Resources:

- GSE Frameworks-Free Throw Percentages (pg 49-53)
- Tortoise and the Hare

C3.PIi The student can analyze proportional relationships and use them to solve real world and mathematical problems.

Learning Targets:

- I can solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- I can examine real-world problems and create linear systems of equations.

Resources:

- GSE Frameworks- How Much Did They Cost? (pg 54-65)
- Pennies Lab

Unpacking Performance Indicators
Henry County Schools-Office of Mathematics

Time Map *(to be completed by teacher along with lesson planning activities form omitted from this template)*

Duration of Lesson: _____ Dates of Lesson _____

Number of Elements in Standard: _____

Weight on Milestone Assessment: _____

Time for each element: *(try to balance this for the duration of the lesson)*
_____ / element

Assessment Date(s): _____

Graduation Competency:
4. The student uses functions to interpret and analyze a variety of contexts. Functions describe situations where one quantity determines another.

Performance Indicator:
a. The student can define, evaluate, and compare functions.

Ultimate ELEMENT TYPE (place an X on one type)

__(K)nowledge **___ (R)**easoning **_X_ (S)**kill **__(P)**roduct

How will the ultimate target be assessed? (be sure the assessment type is appropriate for the type of target indicated above) (*to be considered by teacher)*

Use the chart below to identify the underpinning targets for the target (element) above. Follow the guidelines below.

K Standard requires K Target(s)	R Standard requires K + R Targets	**S Standard requires K + R + S Targets**	P Standard requires K + R + S* + P Targets *Not always

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Unpacking Performance Indicators
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KNOWLEDGE:

1. **Identify the domain and range of a relation.**
2. **Determine if a graph represents a function.**
3. **Determine if a set of points represents a function.**
4. **Calculate the y-value for an equation when given the x-value.**
5. **Create a table for an equation.**
6. **Determine if a table represents a function.**
7. **Represent a function in the form of ordered pairs, mapping, graph, or listing.**
8. **Graph functions in a coordinate plane.**
9. **Read inputs and outputs from a graph of a function on a coordinate plane.**

REASONING:

1. **Compare two functions represented differently (algebraically, graphically, numerically in tables, or by verbal description).**
2. **Draw conclusions based on different representations of functions.**
3. **Compare functions represented in different forms to determine which has the greater rate of change.**

PERFORMANCE SKILL:

1. **Create the full set of representations without changing the data relationship using equations, mappings, tables, t-charts, ordered pairs, and graphs.**

PRODUCT:

1. **Produce an equation, map, table, t-chart, ordered pairs, or graph to demonstrate knowledge of functions.**

*Will the targets identified above move the student toward overall mastery? Yes or No
**If "YES," write the targets in "student friendly" terms and add a stem.
***You may use: "I can…," "I will be able to…," "I am learning to…" etc.

STUDENT FRIENDLY LEARNING TARGETS FOR THE ELEMENT

KNOWLEDGE: (Use an ID system for the target i.e. K1 would be Knowledge target 1)
K1. I can determine if an equation represents a function.
K2. I can identify that each input has exactly one output.
K3. I can apply a function rule for any input that produces exactly one output.

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K4. I can generate a set of ordered pairs from a function and graph the function. **K5. I can identify functions algebraically including slope and y intercept** **K6. I can identify functions using graphs.** **K7. I can identify functions using tables.** **K8. I can identify functions using verbal descriptions.**
REASONING: **R1. I can compare two functions represented differently (algebraically, graphically, numerically in tables, or by verbal description).** **R2. I can draw conclusions based on different representations of functions.** **R3. I can compare functions represented in different forms to determine which has the greater rate of change**
PERFORMANCE SKILL: **PS1. I can create a model of a function using the following: equation, map, table, t-chart, ordered pairs, and graphs.**
PRODUCT: **P1. I can produce an equation, map, table, t-chart, ordered pairs, and a graph to demonstrate my knowledge of functions.**