DIOCESE OF HARRISBURG
MATHEMATICS CURRICULUM – GRADE 8

Anchor		Eighth Grade Expectations	Every eighth grader should be able to:	Text pages of supplementary	Date assessed
8A – Numbers and Operations					
1.	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	a. Represent numbers in equivalent forms.	1. Use scientific notation or exponential forms to express numbers.		
			2. Find the square or cube of a whole number and/or the square root of a perfect square without a calculator.		
		b. Compare quantities or magnitudes of real numbers.	1. Locate or plot decimals, fractions, mixed numbers, and/or integers on a number line. Mix number forms on the same number line.		
			2. Order a set of up to five Real numbers from least to greatest. Mix number forms in the same set.		
2.	Compute accurately and fluently.	a. Compute and/or explain operations with rational numbers.	1. Add, subtract, multiply, and/or divide rational numbers with and without a calculator (straight computation or word problems.)		

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8B –Measurement					
1.	Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.	a. Convert measurements	1. Convert between metric and customary measurements.		
			2. Convert time to two units above or below a given unit (e.g., seconds to hours.)		
			3. Convert temperatures from Fahrenheit to Celsius or Celsius to Fahrenheit.		

Anchor		Eighth Grade Expectations	Every eighth grader should be able to:	Text pages of supplementary	Date assessed
8C - Geometry					
1.	Apply appropriate techniques, tools, and formulas to determine measurements.	a. Determine the measurement of a missing side(s) or angle(s) in a polygon.	1. Determine the number of degrees (for one angle or total) in a 3 through 8-sided polygon and/or the number of sides when given the angle measurement.		
		b. Label, measure, and/or list the properties of angles.	1. Define, identify, and use properties of complementary, supplementary, adjacent, or vertical angles.		
			2. Identify and find the measure of corresponding angles, alternate interior angles, or alternate exterior angles.		
		c. Use, describe, and/or develop procedures to determine measures of perimeter, circumference, area, surface area, and/or volume.	1. Use formulas and procedures to determine circumference, perimeter, and area of simple and complex figures.		
			2. Determine the surface area and volume for 3-dimentional figures.		
		d. Describe how a change in the linear dimension of a figure affects its perimeter, area, or volume.	1. Determine the amount of change in the perimeter, area, or volume of a figure when its length(s) is/are increased or decreased for triangles, parallelograms, trapezoids, circles, cubes, and rectangular prisms.		
		e. Use, describe, and/or develop procedures to determine measures of perimeter, circumference, area, surface area and/or volume.	1. Determine the appropriate type of measurement (circumference, perimeter, area, surface area, volume) for a given situation (e.g. the measurement needed to determine the amount of carpeting for a room.)		

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8C – Geometry (continued)					
2.	Identify and/or apply concepts of transformation or symmetry.	a. Describe, analyze, and/or draw translations, rotations (90, 180, and 360 degrees) and reflections.	1. Draw or identify a rotation (turn) about the origin of a 2-dimensional shape on a grid.		
			2. Draw or identify a reflection (flip) over the axis of a 2-dimensional shape on a grid.		
			3. Draw or identify a translation (slide) of a 2-dimensional shape on a grid.		
3.	Analyze characteristics and properties two and three dimensional geometric shapes and demonstrate understanding of geometric relationships.	a. Identify and/or describe properties or cubes, pyramids, spheres, cones, and/or cylinders.	1. Identify and/or describe properties of cubes, pyramids, spheres, prisms, cones, and cylinders.		
		b. Compute measures of sides of right triangles using the Pythagorean theorem.	1. Use the Pythagorean Theorem to find the measure of a missing side of a right triangle.		
4.	Apply appropriate techniques and tools to create geometric constructions.	a. Apply principles of geometry to create geometric constructions.	1. Construct bisectors for lines and angles using a compass and a straightedge.		
			2. Construct congruent angles, parallel lines, and perpendicular lines using a compass and a straightedge.		
			3. Construct congruent triangles using a compass and a straightedge.		

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8D – Algebraic Concepts					
1.	Demonstrate an understanding of patterns, relations, and functions	a. Analyze, extend, or develop descriptions of patterns or functions.	1. Determine and graph the slope of a line on the coordinate plane using slope formulas.		
			2. Find missing elements in numeric, geometric, or graphic patterns and functions.		
			3. Write/state the rule of a function, given elements in a function, table, chart, or list.		
2.	Represent and/or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	a. Select and/or use a strategy to simplify an expression, solve an equation or inequality and/or check the solution for accuracy.	1. Solve Multistep equations and inequalities.		
			2. Use substitution to check the accuracy of a given value for an equation or inequality. (simple inequalities with one variable)		
			3. Determine the value of an algebraic expression by simplifying and or substituting a value for a variable.		
		b. Create and/or interpret expressions, equations, or inequalities that model problem situations	1. Match a written situation to its numeric and/or algebraic expression, equation, or inequality.		
			2. Write and solve an equation or inequality for a given problem situation.		
3.	Analyze change in various contexts.	a. Analyze the effects of changing a variable in an equation.	1. Determine how a change in one variable relates to a change in a second variable (e.g., 4x = y. What is the effect on y, when x is doubled?)		
4.	Describe or use models to represent quantitative relationships.	a. Represent relationships with tables or graphs on the coordinate plane.	1. Graph a linear function based on a x/y table using rational numbers..		
			2. Match the graph of a linear function to its x/y table. (integers only)		
			3. Graph an inequality on the coordinate plane or number line.		
			4. Match the linear equation (y= mx = b form) to the x/y table (integers only on the table.)		

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8E – Data Analysis and Probability					
1.	Understand and/or apply basic concepts of probability or outcomes.	a. Calculate the probability of an event.	1. Compute probability for independent and dependent events.		
		b. Determine the number of combinations and/or permutations for an event	1. Calculate and show the number of permutations and combinations for an event.		
			2. Calculate/show the number of permutations and/or combinations for an event using at least 4 choices.		
2.	Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.	a. Draw conclusions, make inferences and/or evaluate hypotheses based on statistical and data displays.	1. Create a scatter plot and describe any correlation between the variables. Use a line of best fit.		
			2. Make predictions based on survey results or graphs.		
			3. Use probability to make and test conjectures about the results of probability experiments and simulations.		