

**DIOCESE OF HARRISBURG
MATHEMATICS CURRICULUM – GRADE 5**

Anchor	Fifth Grade Expectations	Every fifth grader should be able to:	Text pages or supplementary materials	Date Assessed
5A.Numbers and Operations				
1.	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems	a. Demonstrate understanding of place value of whole numbers and decimal numbers.	1. Read, write, and identify whole numbers to the billions place.	
			2. Match standard form to word form of decimal numbers through thousandths.	
			3. Write whole and decimal number in standard, expanded and word form; whole numbers in base 10 expanded form e.g., $456=(4 \times 100)+(5 \times 10)+(6 \times 1)$.	
			4. Identify the digit with its place value from hundred millions through thousandths.	
		b. Compare quantities or magnitudes of number.	1. Compare whole numbers up to 9 digits, using comparison words or symbols. Order from least to greatest and/or greatest to least.	
			2. Compare and order decimals through the thousandths.	
			3. Compare and order proper fractions to 16ths with like and unlike denominators.	
		c. Use simple applications of negative numbers (number line, counting, temperature.)	1. Locate negative numbers on a number line (greater than or equal to -20.)	
			2. Identify negative temperatures on a thermometer (Celsius and Fahrenheit).	
			3. Compare and order positive and negative numbers.	
		d. Demonstrate understanding of fractions as parts of a unit whole, as parts of a collection, as a location on number line, and as division of whole numbers. Recognize equivalent forms for an amount.	1. Use or develop regions and/or sets (e.g., circle graphs, hundred-blocks, number line) to model fractions and mixed numbers.	
			2. Represent and write a fraction or decimal that corresponds to a model or problem situation.	
			3. Identify, model, and/or form equivalent fractions.	
			4. Simplify fractions to simplest form using the Greatest Common Factor (GCF.)	
			5. Rename improper fractions as mixed numbers, and mixed numbers as improper fractions.	
			6. Form equivalent fractions for comparing, ordering, adding and subtracting fractions with unlike denominators using the Least Common Multiple (LCM.)	
			7. Identify prime and/or composite numbers less than or equal to 100.	

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5A. Numbers and Operations				
2.	Understand meanings of operations, use operations and understand how they relate to each other.	a. Apply appropriate operation to solve word or computation problems and explain the solution.	1. Solve problems (word or computation problems) involving all operations with decimals, fractions, or whole numbers including money and explain the solution.	
			2. Choose the correct operation(s) to solve a problem with up to two operations.	
		b. Understand and use properties of operations.	1. Complete equations by using the associative, commutative, distributive, and identity properties that govern operations.	
		c. Use order of operations to simplify numerical expressions and to solve equations	1. Simplify numerical expressions using order of operations including parentheses for whole numbers. (no exponents)	
3.	Compute accurately and fluently and make reasonable estimates.	a. Compute accurately without the use of a calculator for both word and computation problems.	1. Demonstrate mastery of the basic addition, subtraction, multiplication, and division facts and build on the memorized facts to mentally compute problems with multiples of 10, 100, 1000. (e.g., 60x700).	
			2. Multiply whole numbers through 4-digits by 2-digit multipliers.	
			3. Divide any whole number by a two-digit divisor or a multiple of 10..	
			4. Add, subtract, multiply or divide fractions with like or unlike denominators. Express answer in simplest form.	
			5. Add, subtract, or multiply decimal numbers through thousandths. Divide a decimal number by a whole number.	
	b. Apply estimation strategies to a variety of problems.	1. Round whole numbers through billions to the nearest 10, 100, 1000, 10,000, 100,000, and 1,000,000; decimals through hundredths.		
		2. Round numbers (up or down, depending on the appropriateness) to estimate sums or differences of quantities.		
		3. Estimate the answer to solve problems involving whole numbers (to thousands) and decimals (to hundredths.)		
		4. Use estimation to determine whether an answer is reasonable.		

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5B. Measurement					
1.	Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.	a. Determine, calculate, and compare time and elapsed time.	1. Figure time differences and understand time zones across the United States.		
			2. Calculate elapsed time and solve elapsed time related problems.		
		b. Select appropriate units (customary and metric) to measure specific attributes of objects.	1. Select the appropriate unit and tool for measuring weight (mass), capacity, length, perimeter, and area.		
		c. Solve problems using simple conversions; add and subtract measurements.	1. Convert using linear measurements, capacity, and weight (mass), within the same system to the unit immediately above or below the given unit. (customary and metric)		
			2. Add or subtract linear measurements or units of time with no regrouping.		
			3. Identify equivalent customary and/or metric units. (e.g., 16 oz.= 1 lb.)		
2.	Apply appropriate techniques, tools, and formulas to determine measurements.	a. Use appropriate tools to determine measurements.	1. Use a ruler to measure objects to the nearest 1/8 inch or nearest mm.		
			2. Use spring or pan balance to determine differences in weight and solve problems.		
			3. Measure capacity of containers and solve capacity problems.		
		b. Solve problems involving length, time, weight, mass, capacity, temperature, perimeter, area, and/or money.	1. Determine the perimeter and area of a square and rectangle using the same measurement units. Develop and use appropriate formulas for area and perimeter of rectangles and squares.		
			2. Solve problems involving weight, time, temperature, length, capacity, mass or money.		
		c. Estimate and/or compare the perimeters or areas of two figures without computation.	1. Estimate which of two given polygons has the greater perimeter or area.		
			2. Estimate and/or compare the area of an irregular figure(s) shown on a grid.		
		d. Recognize that measurements are approximations.	1. Demonstrate how differences in the unit selected for a measurement affects the precision of that measurement.		

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5C. Geometry				
1.	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	a. Identify, define, and/or use basic properties of quadrilaterals (parallelograms, squares, rectangles, trapezoids, rhombi), triangles, circles, pyramids, cubes, and/or prisms.	1. Identify, classify, and compare attributes of quadrilaterals.	
			2. Identify, classify, and compare attributes of triangles (scalene, isosceles, equilateral, acute, right, obtuse.)	
			3. Identify, and/or compare parts of a right triangle, including the right angle, acute angles, legs, and hypotenuse.	
			4. Identify, classify, and compare attributes of 3-dimensional figures (cube, rectangular prism, pyramid) using faces, vertices, and edges.	
			5. Identify, describe, and define diameter, radius, chord, and circumference and/or determine the measure of the radius or diameter of a circle when one of them is provided.	
			6. Identify properties of geometric figures that are used in classifying and describing figures (parallel, perpendicular, similar, congruent, symmetrical.)	
		b. Represent and/or use properties of lines, line segments, rays, points, and planes.	1. Identify, draw representations for, and/or label points, lines, line segments, rays, and planes.	
		2.	Identify and/or apply concepts of transformation or symmetry.	a. Analyze transformations and/or use symmetry to analyze mathematical situations.
	2. Draw or identify the lines of symmetry for a 2-dimensional shape.			
3.	Locate points or describe relationships using the coordinate plane.	a. Identify, plot, or match points given an ordered pair.	1. Identify, plot, or match points on a simple (Quadrant I only) grid with an ordered pair of numbers.	

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5D. Algebraic Concepts				
1.	Demonstrate an understanding of patterns, relations, and functions.	a. Create or extend patterns.	1. Represent and analyze patterns and functions using words, tables, and graphs.	
			2. Extend or find a missing element in a numerical or simple geometric pattern of at least three repetitions.	
			3. Create a numerical or geometric pattern showing at least 3 pattern repetitions.	
		b. Analyze patterns.	1. Form a rule based on a given pattern or illustrate a pattern based on a given rule.	
2.	Represent and /or analyze mathematical situations using numbers, symbols, words, tables, and/or graphs.	a. Select and/or use appropriate strategies, including concrete materials, to solve number sentences.	1. Solve for a missing number (blank, question mark, variable) in an equation involving a single operation.	
			2. Select the operation needed to solve for the variable in a one-step equation.	
			3. Model problem situations with objects, and use representations such as graphs, tables, and equations to draw conclusions.	
			4. Identify the inverse operation needed to solve a one-step equation and/or solve a one-step equation using the inverse operation.	
3.	Analyze change in various contexts.	a. Describe the relationship between rate of change and another variable (e.g., time and temperature in an experiment).	1. Investigate how a change in one variable relates to change in the second variable.	
			2. Solve problems involving a constant rate of change.	
4.	Represent real world situations symbolically.	a. Create or match an equation (number sentence) to a situation and/or create a situation that could be described by an equation.	1. Match a realistic situation to an equation, expression, or inequality.	
			2. Write algebraic expressions and equations to describe situations.	

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5E. Data Analysis and Probability				
1.	Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer those questions.	a. Formulate questions that can be addressed with data.	1. Create questions and /or design appropriate survey tools, tally charts, or tables for the collection of data to determine answers to those questions.	
		b. Collect, organize, and display data in tables, charts, and graphs.	1. Organize, display and/or interpret data using tally charts, tables, pictographs, line graphs, bar graphs, circle graphs, and Venn diagrams.	
			2. Display and/or interpret data shown in tallies, charts, plots, or graphs using a title, labels, and scale when appropriate.	
2.	Select and/or use appropriate statistical methods to analyze data.	a. Describe and analyze data using grade appropriate vocabulary.	1. Determine the mean (average), mode, and range for a set of up to 10 numbers.	
			2. Determine the median for a set of up to 10 numbers. For a set containing an even number of numbers, average the middle two numbers.	
3.	Understand and/or apply basic concepts of probability or outcomes.	a. Predict or determine all possible combinations, outcomes, and/or calculate the probability of a simple event.	1. Predict or determine whether some events are certain, more likely, less likely, equally likely, or impossible based on data or chance.	
			2. Use a tree diagram to determine the number of outcomes related to a given event.	
			3. Describe numerically the chance of an event occurring by using a number between 0 (impossible) and 1 (certain).	