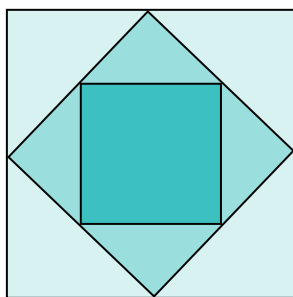


Harford County Public Schools

Meeting the Maryland State Department Voluntary State Curriculum Standards for Mathematics



Fifth Grade

Welcome to fifth grade! In addition to extending their knowledge about numbers and the many ways numbers can be expressed, fifth grade students deepen their understanding of algebraic thinking, including the representation of unknowns and the coordinate plane. Fifth grade students will also learn about congruent figures, geometric transformations, fraction operations, rates, ratios, and percent.

Jacqueline C. Haas, Ed.D.,
Superintendent

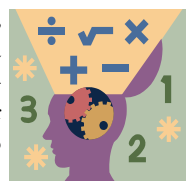
Fifth Grade Mathematics

Algebra, Patterns, and Functions

Fifth grade students will demonstrate an understanding of how patterns, relationships, and functions are connected to the real world. Fifth graders will investigate and model relationships among quantities and apply this knowledge in real world situations.

Fifth grade learning outcomes include:

- Identify, describe, extend, and create numeric patterns by interpreting and writing a rule for a one-operation function table using $+$, $-$, \times , or \div with no remainders, use the operations \times , or \div to create a function table with no remainders, complete a function table using $+$, $-$, \times , \div , or decimals, and apply a given two operation rule for a pattern.
- Write and identify expressions by representing unknown quantities with one unknown and one operation ($+$, $-$, \times , \div with no remainders), determine the value of algebraic expressions with one unknown and one operation, and use parenthesis to evaluate a numeric expression.
- Identify, solve, and apply equations and inequalities by representing relationships by using the symbols ($<$, $>$, $=$) and one operational symbol, with no remainders, on either side.
- Locate points on a number line and in a coordinate grid by representing decimals and mixed numbers on a number line as well as create a graph in a coordinate grid.



Geometry

Fifth grade students will analyze and compare the characteristics and properties of two- and three-dimensional geometric shapes. They will explore ways to describe, reason, and solve problems about shape, size, position, and the motion of objects in relationship to their world.

Fifth grade learning outcomes include:

- Analyze and represent the properties of plane geometric figures by identifying properties of angles using manipulatives and pictures; identify, compare, classify, and describe angles in relationship to another angle; and describe solid figures by the number of edges, faces or vertices.
- Identify and sketch parallel and intersecting line segments.
- Analyze congruent (similar) figures and analyze a transformation by identifying and describing the results of a translation, reflection, or rotation.

Number

Fifth grade students will continue to build a strong foundation of number sense which is paramount to mathematical thinking, since all other areas of mathematics are grounded in numbers. Students will describe, represent, and apply numbers or their relationships when estimating and computing by using mental strategies, paper/pencil, or technology.

Fifth grade learning outcomes include:

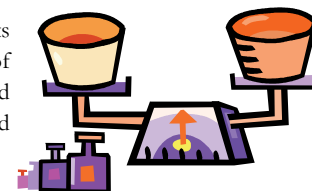
- Apply knowledge of whole numbers and place value by reading, writing, and representing whole numbers to 1,000,000 using symbols, words, models, and expanded form (ex. $241 = 240 + 40 + 1$), as well as identifying, comparing, ordering, and describing the place value of a digit in a number.
- Apply knowledge of fractions of a single region, represent proper fractions of a set which has the same number of items as the denominator, and find equivalent fractions.
- Express decimals in expanded form and compare and order decimals, mixed numbers and fractions with or without using symbols.
- Apply knowledge of money by determining the change from \$100.
- Identify and use divisibility rules, factors, and multiples.
- Add, subtract, multiply, and divide whole numbers as well as add and subtract proper fractions, mixed numbers, and decimals.

Measurement

Fifth grade students will continue to shape their understanding of the attributes, units, processes, and systems of measurement through real world contexts by applying a variety of techniques, formulas, tools, and technology for determining measurement.

Fifth grade learning outcomes include:

- Read and measure customary and metric measurement units by estimating and determining length to the nearest millimeter or $1/4$ inch and estimating and determining weight, mass, and capacity through the selection and use of appropriate tools and units.
- Apply concepts of measurement by estimating and determining perimeter and area, as well as start time, elapsed time, and end time using hour and half-hour intervals.
- Calculate equivalent measurements by determining equivalent units of length (36 inches = 1 yard) and equivalent units of capacity and weight within the same system.



Statistics and Probability

Fifth grade students will discover the world of data and how it helps them be informed citizens, employees, and consumers by collecting, organizing, displaying, analyzing, and interpreting data to make decisions and predictions that are relevant to their world. They will experiment with different methods of reasoning to determine probabilities to make predictions or solve problems about events whose outcomes involve random variation.

Fifth grade learning outcomes include:

- Collect and analyze data in tables by conducting surveys and organizing and displaying data in a line plot and frequency table using a variety of categories and sets of data. Students will also interpret line plots and line graphs, and determine median, mean, mode, and range of a set of data
- Use experimental mental methods of reasoning to determine possibilities when making predictions or solving problems about events whose outcomes involve random variation. Students will determine the probability of an event comprised of an equally likely outcome and will express it in the form of a fraction.



Processes of Mathematics

Fifth grade students demonstrate the processes of mathematics by making connections and applying reasoning to solve problems and communicate their findings. Fifth grade students will continually weave the interconnectedness of the different areas of mathematics and its relationship to the world.

Fifth grade learning outcomes include:

- Identify the question in a problem, make a plan to solve a problem by applying strategies, show that a problem might have multiple solutions or no solution, extend it to a new problem or situation, and use methods of proof.
- Express mathematical ideas orally and in various written and model forms (pictures, symbols, manipulatives, technology).
- Ask questions about mathematical ideas or problems and give feedback to revise mathematical thinking.