

Mathematics Grade 6



Maryland State Curriculum objectives are noted in parenthesis after objective.

QUARTER 1

Processes of Mathematics

(These processes are the structure for delivery of mathematics content objectives.)

Objectives – The students will be able to:

- a. Select and apply appropriate strategies to solve a problem. (Problem Solving) (3.7.A.1.a-h)
- b. Justify solutions to problems with logic and evidence. (Reasoning and Proof) (3.7.B.1.a-d)
- c. (Representation): Represent mathematical concepts in a variety of ways including visual, concrete, and abstract. (Representation)
- d. Write about and discuss mathematical concepts. (Communication) (3.7.C.1.a-h)
- e. Connect mathematical concepts to related concepts and/or connect mathematical concepts to real-world applications. (Connections) (3.7.D.1.a-d)

Algebra, Patterns, and Functions

Objectives - The students will be able to:

- a. Identify, create, and extend a variety of numeric and non-numeric patterns. (6.1.A.1.a)
- b. Analyze patterns and generalize rules illustrated in patterns. (6.1.A.1.a)
- c. Write the rule for a given function. (6.1.A.1.b)
- d. Complete or construct a function table with a two-operation rule. (6.1.A.1.c)
- e. Identify and write equations and inequalities to represent relationships. (6.1.A.2.a)
- f. Solve for the unknown in an inequality. (6.1.A.2.b)
- g. Write an algebraic expression to represent unknown quantities. (6.1.B.1.a)
- h. Evaluate an algebraic expression. (6.1.B.1.a)
- i. Explain and apply the order of operations to evaluate numerical expressions. (6.1.B.1.c)
- j. Solve for the unknown in an equation (one unknown, one operation) with whole number coefficients. (6.1.B.2.b, 6.1.B.2.c)
- k. Write simple algebraic expressions with one unknown and evaluate by substitution. (6.1.B.1.d, 6.1.B.2.a)
- l. Identify the ordered pairs for points and locate the points for ordered pairs in the first quadrant of a coordinate plane. (6.1.C.1.a, 6.1.C.1.b)

Number Relationships and Computation (Number Theory)

Objectives - The students will be able to:

- a. Solve problems using addition, subtraction, multiplication, and division.
- b. Identify and describe the characteristics of numbers divisible by 2, 3, 4, 5, 6, 9, and 10.
- c. Write exponents to express powers of numbers.
- d. Write numerals in exponential notation.
- e. Identify prime and composite numbers.
- f. Determine prime factorization for whole numbers expressed in exponential form. (6.6.B.1.a)
- g. Estimate the square root of a given number and justify in writing.

- h. Identify and apply identity, commutative, and associative.
- i. Identify and apply the distributive property.
- j. Use properties of addition and subtraction to simplify numeric expressions. (6.6.C.1.f)

Statistics (Analyze and Interpret Data)

Objectives - The students will be able to:

- a. Analyze, interpret, and make predictions (in oral and written form) based on tables, frequency tables, circle graphs, single and double bar graphs, line plots, single and double line graphs, stem and leaf plots, and back-to-back stem and leaf plots. (6.4.B.1.a, 6.4.B.1.b, 6.4.B.1.c)
- b. Describe the shape and important features of a data set (using the terms cluster, range, and outlier).
- c. Find the mean, median, mode, and range of a data set.
- d. Interpret a data set based on the mean, median, mode, and range.
- e. Determine the effect of outliers on the mean.

QUARTER 2

Processes of Mathematics

(These processes are the structure for delivery of mathematics content objectives.)

Objectives – The students will be able to:

- a. Select and apply appropriate strategies to solve a problem. (Problem Solving) (3.7.A.1.a-h)
- b. Justify solutions to problems with logic and evidence. (Reasoning and Proof) (3.7.B.1.a-d)
- c. (Representation): Represent mathematical concepts in a variety of ways including visual, concrete, and abstract. (Representation)
- d. Write about and discuss mathematical concepts. (Communication) (3.7.C.1.a-h)
- e. Connect mathematical concepts to related concepts and/or connect mathematical concepts to real-world applications. (Connections) (3.7.D.1.a-d)

Number Relationships and Computation (Fractions)

Objectives - The students will be able to:

- a. Read, write or represent fractions or mixed numbers using symbols, models, and words.
- b. Compare and order fractions on a number line. (6.6.A.1.d)
- c. Find factors and common factors of numbers.
- d. Simplify and determine equivalent fractions.
- e. Find multiples, common multiples, and the least common multiple to determine the least common denominator.
- f. Rename mixed numerals as improper fractions and improper fractions as mixed numerals.
- g. Add and subtract fractions and mixed numerals with like and unlike denominators in simplest form. (6.6.C.1.a)
- h. Illustrate and model the product of two fractions.
- i. Multiply a fraction by a fraction. (6.6.C.1.b)
- j. Multiply a fraction by a whole number. (6.6.C.1.b)
- k. Multiply a mixed numeral by a whole number
- l. Multiply fraction by a mixed numeral.
- m. Construct a model to show division of a fraction by a fraction.
- n. Divide a whole number by a fraction.
- o. Divide a fraction by a fraction.

Number Relationships and Computation (Decimals)

Objectives - The students will be able to:

- a. Read, write, and represent decimal numerals through ten-thousandths.
- b. Estimate the value of a decimal as being close to zero, one-half, or one and indicate its placement on a number line.
- c. Compare fractions, mixed numbers, and decimals (through thousandths) on a number line. (6.6.A.1.d)
- d. Express a fraction as a decimal and percent, and a decimal as a fraction and percent. (6.6.A.1.c)
- e. Add and subtract decimals.
- f. Multiply a whole number by a decimal. (6.6.C.1.c)
- g. Multiply a decimal by a decimal. (6.6.C.1.c)
- h. Divide a decimal by a whole number. (6.6.C.1.d)
- i. Estimate products and quotients of decimals. (6.6.C.2.a)
- j. Multiply and divide a decimal through thousandths by 10, 100, and 1,000 using mental computation.

QUARTER 3

Processes of Mathematics

(These processes are the structure for delivery of mathematics content objectives.)

Objectives – The students will be able to:

- a. Select and apply appropriate strategies to solve a problem. (Problem Solving) (3.7.A.1.a-h)
- b. Justify solutions to problems with logic and evidence. (Reasoning and Proof) (3.7.B.1.a-d)
- c. (Representation): Represent mathematical concepts in a variety of ways including visual, concrete, and abstract. (Representation)
- d. Write about and discuss mathematical concepts. (Communication) (3.7.C.1.a-h)
- e. Connect mathematical concepts to related concepts and/or connect mathematical concepts to real-world applications. (Connections) (3.7.D.1.a-d)

Probability

Objectives - The students will be able to:

- a. List all possible outcomes of an event with a limited number of possible results. (6.5.B.1.a, 6.5.B.1.c, 6.5.B.c)
- b. Find the probability of an event with equally likely outcomes and express as a fraction, decimal or percent.
- c. Conduct an experiment and make a prediction based on the outcomes of the experiment. (6.5.C.1.a, 6.5.C.2.a)
- d. Find the probability for a dependent event.

Geometry

Objectives - The students will be able to:

- a. Identify, label, and draw points, lines, line segments, vertices, rays, and planes. (6.2.A.1.a, 6.2.A.1.b)
- b. Identify, describe, and classify lines as intersecting, parallel, or perpendicular.
- c. Identify, classify, measure (using a protractor), draw, and label acute, right, and obtuse, straight, and reflex angles. (6.3.B.2.a)
- d. Identify, calculate, and compare supplementary, and complementary angles. (6.2.C.2.c)
- e. Compare and classify triangles by sides and angle measure. (6.2.A.2.a, 6.2.A.2.b)

- f. Determine a third angle measure of a triangle given two angle measures. (6.2.A.2.c)
- g. Identify and describe the relationship between the radius, diameter, center, chord, and arc of a circle. (6.2.A.1.c, 6.2.A.2.d)
- h. Recognize and interpret Pi (π).
- i. Find the circumference of a circle given the radius or diameter.
- j. Construct geometric figures (squares, triangles, rectangles) given their dimensions using tools and technology (6.2.C.1.a)
- k. Identify, describe, and draw a polygon on a coordinate plane. (6.2.C.1.b)
- l. Identify and classify pyramids or prisms as triangular pyramids, rectangular pyramids, triangular prisms, or rectangular prisms by the number of edges, faces or vertices.
- m. Identify and classify triangular or rectangular pyramids by the base.
- n. Analyze the relationship between plane geometric figures and surfaces of solid figures: compare triangles to rectangular prisms and circles/rectangles to cylinders.
- o. Identify and model transformations: translations, reflections, and rotations.
- p. Identify, describe, and represent similarity and congruency with geometric figures and real-world objects. (6.2.D.1.a)
- q. Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs using concrete objects and the computer. (6.2.E.1.a)

Measurement

Objectives - The students will be able to:

- a. Select the appropriate tool/unit for measuring attributes of: length (1/8 of an inch) (including perimeter, width, height, circumference, and distance) area, weight, temperature, time, capacity, volume, and size of angle (using a protractor). (6.3.B.1.a)
- b. Identify and calculate equivalent units within the same system.
- c. Estimate and determine the perimeter and area for regular figures (use formulas when appropriate) and irregular figures (measuring and partitioning). (6.3.C.1.a, 6.3.C.1.c)
- d. Determine the missing dimension of a quadrilateral given the perimeter length. (6.3.C.1.d)
- e. Determine the missing dimension of a rectangle given the area. (6.3.C.1.d)
- f. Explain what happens to the perimeter and area of a two-dimensional figure when one of those measures changes.
- g. Determine the surface area of a cube and rectangular prism.
- h. Determine the volume of a rectangular prism, cube, and cylinder. (6.3.C.1.b)
- i. Estimate and determine elapsed time to solve real life problems.

QUARTER 4

Processes of Mathematics

(These processes are the structure for delivery of mathematics content objectives.)

Objectives – The students will be able to:

- a. Select and apply appropriate strategies to solve a problem. (Problem Solving) (3.7.A.1.a-h)
- b. Justify solutions to problems with logic and evidence. (Reasoning and Proof) (3.7.B.1.a-d)
- c. (Representation): Represent mathematical concepts in a variety of ways including visual, concrete, and abstract. (Representation)
- d. Write about and discuss mathematical concepts. (Communication) (3.7.C.1.a-h)
- e. Connect mathematical concepts to related concepts and/or connect mathematical concepts to real-world applications. (Connections) (3.7.D.1.a-d)

Number Relationships and Computation (Ratio and Proportion)

Objectives - The students will be able to:

- a. Read and write ratio notations to compare two quantities. (6.6.C.3.a)
- b. Write equal ratios by finding equivalent fractions.
- c. Write a proportion to solve a problem. (6.6.C.3.b)
- d. Using a denominator of 100, express a fraction and decimal as a percent and percent as a fraction and decimal.
- e. Identify and represent equivalent fractions, decimals, and percents. (6.6.C.3.a)
- f. Estimate and calculate the percent of a given number and solve real life problems. (6.6.C.1.e)

Number Relationships and Computation (Integers)

Objectives - The students will be able to:

- a. Read, write, and represent positive and negative integers. (6.6.A.1.b)
- b. Locate positive and negative integers on a number line.
- c. Compare and order integers. (6.6.A.1.e)
- d. State and define the absolute value of an integer.
- e. Add and subtract negative and positive integers.

Algebra, Patterns, and Functions

Objectives - The students will be able to:

- a. Plot and name an ordered pair from a point on the coordinate plane in all four quadrants.
- b. Determine the unknown in a linear equation.
- c. Solve and graph linear equalities and inequalities.
- d. Identify and describe the change represented in a graph.

Statistics (Organize and Display Data)

Objectives - The students will be able to:

- a. Describe the shape and important features of a set of data. (Using the terms cluster, range, mean, median, mode, and outlier.)
- b. Organize and display data through tables (frequency tables), single and double bar graphs, line plots, single and double line graphs, stem-and-leaf plots, and back-to-back stem-and-leaf plots including the use of technology. (6.4.A.1.a, 6.4.A.1.b, 6.4.A.1.c)
- c. Organize and display data using a histogram.