

Eighth Grade Math (MA.8)

Focus Statement: Eighth grade students will perform operations on real numbers; solve and graph equations; apply concepts of ratios, proportions and percents; and will apply geometric concepts and formulas to solve problems.

Outcomes:

- MA.8:1 Students will use real number properties to solve one-step equations and inequalities including those that contain integers. (6A.G1, 6A.H1, 6B.F4, 6B.G5, 6B.H3, 6C.G1, 8D.F1)
- MA.8:1-1 Simplify expressions containing integers using order of operations and properties including the commutative, associative, distributive, zero, and identity properties.
 - MA.8:1-2 Perform operations with integers with accuracy.
 - MA.8:1-3 Solve one-step algebraic equations with integers.
 - MA.8:1-4 Solve and graph one-step inequalities with integers
 - MA.8:1-5 Use exponential and scientific notation to describe numbers.
- MA.8:2: Students will use operations to evaluate expressions and solve equations with rational numbers. (6B.F4, 6B.H2, 6B.H4, 6C.G1, 6C.G3, 6C.H2, 8B.F1, 8C.F4, 9C.H3)
- MA.8:2-1 Define and describe rules for operating with rational numbers.
 - MA.8:2-2 Explain why division by zero is undefined.
 - MA.8:2-3 Perform addition and subtraction with rational numbers
 - MA.8:2-4 Perform multiplication and division with rational numbers.
 - MA.8:2-5 Solve one-step equations with rational numbers.
 - MA.8:2-6 Solve one-step inequalities with rational numbers and graph on a number line.
 - MA.8:2-7 Identify and find the square roots of rational numbers.
 - MA.8:2-8 Define real numbers and identify a number as rational or irrational.
- MA.8:3: Students will analyze and apply geometric concepts to make conjectures on angle relationships. (7C.H2, 9A.F5, 9C.F2, 9C.F3, 9C.G3, 9C.G4)
- MA.8:3-1 Determine the relationship among angles formed by intersecting lines.
 - MA.8:3-2 Solve problems involving angle measurement.
 - MA.8:3-3 Justify properties of angles formed by parallel lines cut by a transversal and define angles using appropriate terminology (Examples: corresponding angles, alternate interior, alternate exterior).
 - MA.8:3-4 Determine unknown angle measures using angle relationships and properties of polygons.

- MA.8:3-5 Make and test conjectures about the relationships between side length and angle measurement in various triangles and quadrilaterals.
- MA.8:4 Students will apply formulas, including the Pythagorean Theorem, to determine the total surface area of three-dimensional objects. (7C.F2, 7C.F5, 7C.G1, 7C.G3, 7C.H3, 7C.H7, 9D.H1, 9D.H4, 9D.H5, 9A.H5, 9C.H1, 9D.G1, 9D.G2)
- MA.8:4-1 Solve pictorial and word problems that involve geometric relationships including the Pythagorean Theorem.
- MA.8:4-2 Analyze the relationship between sides of right triangles and apply the Pythagorean Theorem to solve for a missing side in a triangle.
- MA.8:4-3 Determine if a triangle is a right triangle using the Pythagorean Theorem.
- MA.8:4-4 Recognize Pythagorean triples.
- MA.8:4-5 Identify the edges, faces, and vertices of three-dimensional shapes.
- MA.8:4-6 Create three-dimensional shapes from two-dimensional representations of the object, including multiple views and/or nets.
- MA.8:4-7 Select an appropriate formula or strategy to find the surface area of a cube, triangular, or rectangular prism.
- MA.8:4-8 Calculate the surface area of a cube, triangular and rectangular prism.
- MA.8:4-9 Select an appropriate formula or strategy to find the surface area of a pyramid, cylinder, and cone.
- MA.8:4-10 Calculate the surface area of a pyramid, cylinder, and cone.
- MA.8:4-11 Select and use appropriate units and tools to measure surface area accurately for a given situation.
- MA.8:5 Students will apply geometric concepts and formulas to solve problems involving the volume of three-dimensional objects. (7C.F2, 7C.F4, 7C.G1, 7C.G3, 7C.H3, 7C.H8, 9A.G6, 9B.F4)
- MA.8:5-1 Select an appropriate formula or strategy to find the volume of a cube, triangular, and rectangular prism.
- MA.8:5-2 Calculate the volume of a cube, triangular and rectangular prism.
- MA.8:5-3 Select an appropriate formula or strategy to find the volume of a pyramid, cylinder, and cone.
- MA.8:5-4 Calculate the volume of a pyramid, cylinder, and cone.
- MA.8:5-5 Select and use appropriate units and tools to measure volume accurately for a given situation.
- MA.8:5-6 Select an appropriate formula to determine the volume of a sphere.
- MA.8:5-7 Calculate the volume of a sphere.
- MA.8:6 Students will apply ratios and proportions to solve a variety of problems. (7C.G4, 6D.F4, 6D.F5, 6D.G1, 6D.G2, 6D.G3, 6D.G4, 6D.H1, 7A.G2, 7A.H1, 7C.G5, 7C.H1, 7C.H5, 9B.H1, 9B.H2, 9D.H2, 9D.H3)
- MA.8:6-1 Solve equations using ratios and proportions.

- MA.8:6-2 Create and explain a variety of equivalent ratios to represent a given situation.
- MA.8:6-3 Solve simple problems involving rate, time and distance.
- MA.8:6-4 Solve number sentences and word problems involving proportions and explain methods for solving such problems.
- MA.8:6-5 Solve problems involving mixed units of the same attribute including time, money, length, and area (Examples: feet and inches; minutes and seconds).
- MA.8:6-6 Use proportions to solve problems involving similar figures.
- MA.8:6-7 Use the Pythagorean Theorem and proportions to find missing side(s) in similar polygons.
- MA.8:6-8 Solve problems involving scale drawings, models, maps, or blueprints.
- MA.8:6-9 Create and analyze scale models using proportional reasoning.
- MA.8:6-10 Solve simple scale conversions as on maps and diagrams.
- MA.8:6-11 Identify the basic trigonometric ratios and use to solve for missing side lengths in right triangles using technology as appropriate.
- MA.8:7 Students will represents parts of a whole in the form of a percent and apply percents to solve a variety of real life situations. (6A.E2, 6D.F1, 6D.F2, 6D.G1, 6D.H2, 6D.I1)
- MA.8:7-1 Represent parts of a whole as a fraction, decimal, or percent and use interchangeably to solve number sentences and word problems.
- MA.8:7-2 Solve number sentences and word problems using percents.
- MA.8:7-3 Create a circle graph given a set of data.
- MA.8:7-4 Use proportions and equations to solve word problems that include interest, percent of increase and decrease, and other real life situations.
- MA.8:8 Students will solve multi-step algebraic equations and inequalities including those using standard formulas. (6B.G7, 8B.G2, 8D.H1)
- MA.8:8-1 Solve multi-step equations.
- MA.8:8-2 Solve multi-step inequalities and graph on a number line.
- MA.8:8-3 Solve equations with variables on both sides.
- MA.8:2-4 Graph two inequalities with a single variable on a number line.
- MA. 8:9 Students will solve linear equations and graph their solutions. (8B.F2, 8B.F3, 8A.H5, 8B.G1, 8B.H1, 8B.H2, 8B.H3, 8B.H5, 8D.F2, 8D.G1, 8D.G2, 8D.H1)
- MA.8:9-1 Graph a set of points and describe the relationship as linear or nonlinear.
- MA.8:9-2 Create a table of values for simple linear equations and graph the ordered pairs on a coordinate plane.
- MA.8:9-3 Graph linear equations and inequalities on the Cartesian plane.
- MA.8:9-4 Identify slope and y-intercept of a linear equation when given slope-intercept form.
- MA.8:9-5 Identify slope and y-intercept from a graph.

- MA.8:9-6 Calculate the slope of a line given two points.
- MA.8:9-7 Graph linear equations using slope-intercept form of a line.
- MA.8:9-8 Identify and graph direct variation equations.
- MA.8:9-9 Solve word problems that involve linear equations or inequalities using algebraic or graphical representations.