
Coal City Unit District #1
Math 8
Math Curriculum

MA.8:1 Students will identify numbers that are not rational, and approximate them using rational numbers. (NS)

- MA.8:1-1 Identify whether numbers are rational or irrational.
- MA.8:1-2 Approximate square roots by using perfect squares and decimal approximations.
- MA.8:1-3 Plot approximations of irrational numbers on a number line. (e.g. graph the 3rd root of 10)
- MA.8:1-4 Write repeating decimals as fractions.
- MA.8:1-5 Compare and order rational and irrational numbers.

MA.8:2 Students will solve problems involving radicals and integer exponents. (EE)

- MA.8:2-1 Generate equivalent numerical expressions using the properties of integer exponents, both positive and negative. (e.g. $3^2 \times 3^{-6} = 3^{-4}$)
- MA.8:2-2 Use the product rule to multiply exponential expressions with like bases.
- MA.8:2-3 Use the power rule to raise powers to powers.
- MA.8:2-4 Use the quotient rule to divide exponential expressions with like bases.
- MA.8:2-5 Simplify expressions using the Zero Exponent Property.
- MA.8:2-6 Simplify expressions using the Negative Exponent Property.
- MA.8:2-7 Simplify expressions using a combination of the properties.
- MA.8:2-8 Identify numbers as perfect squares, perfect cubes, both or neither.
- MA.8:2-9 Evaluate square roots and cube roots to solve problems.
- MA.8:2-10 Solve equations involving squares or cubes.

MA.8:3 Students will analyze and use scientific notation to solve various problems. (EE)

- MA.8:3-1 Convert numbers between standard notation and scientific notation.
- MA.8:3-2 Estimate and compare large and small quantities using powers of 10.
- MA.8:3-3 Add and subtract numbers in scientific notation.
- MA.8:3-4 Multiply and divide numbers in scientific notation.

- MA.8:4 Students will identify connections between proportional relationships, lines, and linear equations. (EE)**
- MA.8:4-1 Analyze equations, linear graphs, and tables to find unit rates.
 - MA.8:4-2 Write or graph a linear equation in the form $y = mx$.
 - MA.8:4-3 Write or graph a linear equation in the form $y = mx + b$.
 - MA.8:4-4 Analyze graphs in context to determine and explain the meaning of the rate of change or the y-intercept.
- MA.8:5 Students will solve linear equations. (EE)**
- MA.8:5-1 Solve linear equations in one variable with like terms on one side of the equation.
 - MA.8:5-2 Solve linear equations in one variable with like terms on both sides of the equation.
 - MA.8:5-3 Solve multi-step, linear equations in one variable using the distributive property.
 - MA.8:5-4 Determine the number of solutions to an equation.
 - MA.8:5-5 Construct linear equations to represent real world scenarios.
- MA.8:6 Students will solve pairs of simultaneous linear equations. (EE)**
- MA.8:6-1 Examine graphs of linear systems of equations to determine the number of solutions, based on number of intersection points.
 - MA.8:6-2 Compare the equations in a linear system to look for a number of solutions and the slopes and y-intercepts of the equations.
 - MA.8:6-3 Solve simultaneous equations by graphing.
 - MA.8:6-4 Solve simultaneous equations by substitution.
 - MA.8:6-5 Solve simultaneous equations by elimination.
- MA.8:7 Students will define, evaluate, and compare functions. (F)**
- MA.8:7-1 Identify whether a relation is a function.
 - MA.8:7-2 Identify linear and nonlinear functions in different representations.
 - MA.8:7-3 Compare the rate of change of functions given in different representations.
 - MA.8:7-4 Compare the initial value of functions given in different representations.
 - MA.8:7-5 Describe the graph of a function at each interval.

MA.8:8 Students will use functions to model relationships between quantities. (F)

- MA.8:8-1 Construct a linear function to model a relationship using an equation in the form $y = mx + b$.
- MA.8:8-2 Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph.
- MA.8:8-3 Describe qualitatively the behavior of a function by analyzing its graph.
- MA.8:8-4 Draw a qualitative graph of a function based on a verbal description.
- MA.8:8-5 Analyze and interpret the sketch of a graph of a function.

MA.8:9 Students will recognize congruence and similarity using physical models, transparencies, or geometry software. (G)

- MA.8:9-1 Translate a figure on a coordinate plane.
- MA.8:9-2 Describe a translation.
- MA.8:9-3 Reflect a figure on a coordinate plane.
- MA.8:9-4 Describe a reflection.
- MA.8:9-5 Rotate a figure on a coordinate plane.
- MA.8:9-6 Describe a rotation.
- MA.8:9-7 Describe a sequence of transformations on a figure.
- MA.8:9-8 Perform a sequence of transformations on a figure.
- MA.8:9-9 Identify congruent figures.
- MA.8:9-10 Dilate a figure on a coordinate plane.
- MA.8:9-11 Describe a dilation.
- MA.8:9-12 Identify similar figures.

MA.8:10 Students will apply geometric concepts to find unknown angle measures. (G)

- MA.8:10-1 Identify the angle relationships formed by parallel lines and transversals.
- MA.8:10-2 Determine the measures of angles formed by parallel lines and transversals using the identified relationships.
- MA.8:10-3 Determine the measures of angles by using the Triangle Sum Theorem.
- MA.8:10-4 Determine the measures of angles by using the Exterior Angle Theorem.
- MA.8:10-5 Determine whether triangles are similar using Angle-Angle Similarity.
- MA.8:10-6 Solve problems involving similar triangles.

MA.8:11 Students will apply the Pythagorean Theorem. (G)

- MA.8:11-1 Determine if a right triangle exists when given the lengths of the three sides of the triangle.
- MA.8:11-2 Find a missing leg or hypotenuse of a right triangle given the other 2 side lengths.
- MA.8:11-3 Solve real world problems using the Pythagorean Theorem for 2 dimensional figures.
- MA.8:11-4 Solve real world problems using the Pythagorean Theorem for 3 dimensional figures.
- MA.8:11-5 Find the distance between two points in a coordinate system by using the Pythagorean Theorem.
- MA.8:11-6 Find the perimeter of a figure on a coordinate plane.
- MA.8:11-7 Identify the coordinates of the third vertex of a triangle on the coordinate plane given two vertices and a description of the triangle.

MA.8:12 Students will solve mathematical and real world problems involving volume of prisms, cylinders, cones, and spheres. (G)

- MA.8:12-1 Apply the formula for surface area of a prism to solve mathematical and real world problems.
- MA.8:12-2 Apply the formula for volume of a prism to solve mathematical and real world problems.
- MA.8:12-3 Apply the formula for surface area of a cylinder to solve mathematical and real world problems.
- MA.8:12-4 Apply the formula for volume of a cylinder to solve mathematical and real world problems.
- MA.8:12-5 Apply the formula for surface area of a cone to solve mathematical and real world problems.
- MA.8:12-6 Apply the formula for volume of a cone to solve mathematical and real world problems.
- MA.8:12-7 Find the volume of a cone given the circumference of the base.
- MA.8:12-8 Apply the formula for surface area of a sphere to solve mathematical and real world problems.
- MA.8:12-9 Apply the formula for volume of a sphere to solve mathematical and real world problems.
- MA.8:12-10 Find the volume of a sphere given its surface area.
- MA.8:12-11 Find the volume of a composite figure.

MA.8:13 Students will investigate patterns in bivariate data. (SP)

- MA.8:13-1 Construct a scatter plot graph to model paired data.
- MA.8:13-2 Utilize a scatter plot to identify and interpret the relationship between paired data.
- MA.8:13-3 Describe patterns such as clustering and outliers.
- MA.8:13-4 Recognize whether the paired data has a linear association, a nonlinear association, or no association.
- MA.8:13-5 Draw a trend line for a linear association.
- MA.8:13-6 Use the trend line to determine whether a linear association is positive or negative and strong or weak.
- MA.8:13-7 Use the slope and the y-intercept of a trend line to make a prediction.
- MA.8:13-8 Organize paired categorical data into a two-way frequency table.
- MA.8:13-9 Compare and make conjectures about data displayed in a two-way frequency table.
- MA.8:13-10 Construct a two-way relative frequency table.
- MA.8:13-11 Compare and make conjectures about data displayed in a two-way relative frequency table.