Teaching & Learning Standards

Math Learning Targets

8th Grade

Unit 1: Transformations, Congruence, and Similarity

Understand congruence and similarity using physical models, transparencies, or geometry software.

MGSE8.G.1 (experiment with transformations)

- K1: I can translate, rotate, and reflect line segments, angles, parallel lines or geometric figures.

MGSE8.G.2 (Congruence)

- R1: I can explain whether or not two figures are congruent using transformations.
- R2: I can explain the series of transformations used to transform a figure to its congruent counterpart.

MGSE8.G.3 (Transformations on the coordinate plane)

- R1: I can describe the effect of dilations using coordinates.
- R2: I can describe the effect of rotations using coordinates.
- R3: I can describe the effect of translations using coordinates.
- R4: I can describe the effect of reflections using coordinates.
- R5: I can determine the new coordinates of a figure given a dilation, translation, rotation, or reflection.

MGSE8.G.4 (Similarity)

- K1: I can identify similar figures produced by a series of dilations and/or transformations.
- R1: I can explain similarity of figures in terms of dilations and/or transformations.
- R2: I can show triangles are similar by AA and explain why AA is enough to show similarity.

MGSE8.G.5 (Investigating angles)

- R1: I can reason and explain why the angle-sum and exterior-angle theorems of a triangle are true.
- K1: I can identify congruent angle pairs created by parallel lines cut by a transversal.
- K2: I can identify supplementary angle pairs created by parallel lines cut by a transversal.
- R1: I can explain which angle pairs are congruent and why.
- R2: I can explain which angle pairs are supplementary and why.

Unit 2: Exponents

Work with radicals and integer exponents.

MGSE8.EE.1 (Integer exponents)

- K1: I can use properties of integer exponents to evaluate and simplify numerical expressions.
- R1: I can derive and explain the properties of exponents.

MGSE8.EE.2 (Square & cube roots & equations)

- K1: I can evaluate square roots and cube roots of perfect squares < 625
- K2: I can evaluate cube roots of perfect cubes >-1000 and <1000.
- K3: I can solve equations with exponents with powers of 2 using square or cube roots.

MGSE8.EE.3 (Estimate with scientific notation)

- K1: I can estimate very large and very small quantities using a single digit times a power of 10.
- K2: I can write numbers in scientific notation.
- R1: I can compare two quantities written as a single digit times a power of 10.

MGSE8.EE.4 (Compute with scientific notation)

- K1: I can perform operations with numbers expressed in scientific notation.
- R1: I can use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.
- R2: I can interpret scientific notation that has been generated by technology.

Analyze and solve linear equations and pairs of simultaneous linear equations.

MGSE8.EE.7 (Solve linear equations)

- R1: I can solve linear equations in one variable

MGSE8.EE.7a (Multi-step equations)

- K1: I can write linear equations in one variable that give one solution, infinitely many solutions or no solutions.
- K2: I can solve linear equations in one variable that give one solution, infinitely many solutions or no solutions.
- K3: I can simplify a linear equation by using the distributive property and combining like terms.
- R1: I can explain linear equations in one variable that give one solution, infinitely many solutions or no solutions.

Unit 2: Exponents

Work with radicals and integer exponents. (cont.)

MGSE8.EE.7b (Linear equations with rationals)

- K1: I can solve equations using the distributive property (include equations w/ the variable on both sides).
- K2: I can solve equations by combining like terms (include equations w/ the variable on both sides).

Know that there are numbers that are not rational, and approximate them by rational numbers.

MGSE8.NS.1 (Irrational numbers)

- K1: I can explain the difference between a rational and an irrational numbers.
- K2: I can convert repeating and terminating decimals into fractions.

MGSE8.NS.2 (Rational approximations)

- R1: I can write a decimal approximation for an irrational number to a given decimal place.
- R2: I can place rational and irrational numbers accurately on a number line.
- R3: I can estimate the value of an expression that includes an irrational number and justify my estimation.

Unit 3: Geometric Applications of Exponents

Understand and apply the Pythagorean Theorem.

MGSE8.G.6 (Pythagorean Theorem & it's converse)

- K1: I can use the Pythagorean Theorem to determine if a given triangle is a right triangle.
- R1: I can explain a proof of the Pythagorean Theorem and its converse.

MGSE8.G.7 (Apply the Pythagorean Theorem)

- K1: I can identify the Pythagorean theorem.
- K2: I can substitute values for the correct variables in the Pythagorean Theorem from a given situation/context.
- R1: I can apply the Pythagorean Theorem in real-world situations or drawings to find unknown side lengths in right triangles in two and three dimensions.

MGSE8.G.8 (Pythagorean Theorem & distance)

- K1: I can plot points on a coordinate grid in all four quadrants
- R1: I can use the Pythagorean Theorem to find the distance between two points on a coordinate system.

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

MGSE8.G.9 (Volume formulas)

- K1: I can state and use the formulas for volumes to solve real world and mathematical problems involving cones, cylinders, and spheres.

Work with radicals and integer exponents

MGSE8.EE.2 (Square & cube roots & equations)

- K1: I can evaluate the square root of a perfect square and the cube root of a perfect cube.

Unit 4: Functions

Define, evaluate, and compare functions.

MGSE8.F.1 (Understanding functions)

- K1: I can explain what a function is.
- K2: I can define a function as rule, where for each input there is exactly one output.
- R1: I can determine the domain and range for a relation
- R2: I can show the relationship between input and outputs of a function by graphing them as ordered pairs on a coordinate grid.

MGSE8.F.2 (Comparing functions)

- K1: I can determine if a table of values, a graph, or a set of ordered pairs is or is not a function.
- R1: I can justify whether or not a table of values, a graph, or a set of ordered pairs is or is not a function.
- R2: I can determine which of two functions has a greater rate of change (represented algebraically, graphically, numerically in tables, or by verbal descriptions).

Units 5 and 6: Linear Functions, Models, and Tables

Understand the connections between proportional relationships, lines, and linear equations.

MGSE8.EE.5 (Graph proportional relationships-slope)

- K1: I can graph proportional relationships.
- R1: I can interpret the unit rate as the slope.
- R2: I can compare two different proportional relationships given different representations.

MGSE8.EE.6 (Similar triangles to derive y=mx & y=mx+b)

- K1: I can calculate slope on a graph using similar triangles.
- R1: I can explain why slope is the same between any two distinct points on a non-vertical line using similar triangles.
- R2: I can derive the equation y = mx and the equation y= mx + b.

Define, evaluate, and compare functions.

MGSE8.F.3 (Linear & non-linear functions)

- K1: I can distinguish between linear and nonlinear functions given a table, graph, or equation.
- R1: I can justify which functions are linear and non-linear.

Use functions to model relationships between quantities.

MGSE8.F.4 (Construct a function)

- K1: I can write the equation of a line (in the form y = mx + b) given a point and a slope, two points, a table, or the graph of the line.

MGSE8.F.5 (Analyze & sketch functional relationships)

- K1: I can sketch a function given the slope and y-intercept.
- R1: I can explain a real-world situation from an equation, table, or graph (explain the rate of change/slope and the y-intercept in the context). (linear only)
- R2: I can create the equation, table or graph for a real-life situation. (linear only)
- R3: I can describe a relationship as increasing or decreasing, linear or nonlinear, from an equation, table or graph.

Units 5 and 6: Linear Functions, Models, and Tables (cont.)

Investigate patterns of association in bivariate data.

MGSE8.SP.1 (Scatterplots)

- K1: I can construct a scatter plot.
- R1: I can interpret scatter plots.
- R2: I can describe the relationships shown in a scatter-plot.

MGSE8.SP.2 (Best fit line)

- K1: I can sketch a line of best fit on a scatter plot
- R1: I can justify the location of my line of best fit and explain why or why not a given line is a good fit.

MGSE8.SP.3 (Interpreting bivariate data)

- R1: I can write the equation of a line of best fit and use it to make predictions.
- R2: I can explain what the slope and y-intercept mean in terms of the situation.

MGSE8.SP.4 (2-way tables & Relative Frequencies)

- K1: I can construct two-way frequency and relative frequency tables to summarize bivariate categorical data.
- R2: I can describe, interpret, and justify inferences in patterns of association between the two variables.

Unit 7: Systems of Equations

Analyze and solve linear equations and pairs of simultaneous linear equations.

MGSE8.EE.8 (Analyze & solve linear systems)

- S2: I can analyze and solve pairs of simultaneous linear equations

MGSE8.EE.8a (Solutions to systems)

- S2: I can explain solutions to a system of two linear equations in two variables as the point of intersection of their graph.
- S2: I can describe the point of intersection between two lines as the point that satisfies both equations at the same time.

MGSE8.EE.8b (Solve systems algebraically and graphically)

- S2: I can solve and explain (in terms of the situation) a system of linear equations graphically, including those that have no solution or infinitely many solutions.
- S2: I can solve and explain (in terms of the situation) a system of linear equations algebraically, including those that have no solution or infinitely many solutions.
- S2: I can identify cases in which a system of two equations in two unknown s has no solution or an infinite number of solutions.

MGSE8.EE.8c (Systems in context)

- S3: I can solve real-world problems involving a system of linear equations.