

8th Grade Math Continuum of Learning

GRADE: 8 th Con	itent Area: Math		
Standard: Expressions and Equations			
Key Idea: Work with radicals and integer exponents.			
Required Skills:			
a.) I can use the properties of integer exponents to generate equivalent numerical expressions.			
b.) I can use square root and cube root symbols t number.	to represent solutions to equations like $x^2 = p$ and $x^3 = p$, where p is a positive rational		
c.) I can evaluate the square roots of small perfect squares and the cube roots of small perfect cubes. I also know that $\sqrt{2}$ is irrational."			
d.) I can use numbers expressed as a single-digit times an integer power of 10 to estimate very large or very small quantities, and to compare how many times one is as much as the other.			
e.) I can perform operations with numbers expressed in scientific notation, including problems that use both decimal and scientific			
notation.			
f.) I can use scientific notation and choose appro	priate units for measurements of very large or small quantities (e.g., millimeters per year		
for seafloor spreading.			
g.) I can also interpret scientific notation generat	ed by technology.		
Key Idea: Understand the connections between proportional relationships, lines, and linear equations.			
Required Skills:			
a.) I can graph proportional relationships and interpret the unit rate as the slope of the graph.			
b.) I can also compare two different proportional relationships represented in different ways.			
c.) I can use similar triangles to explain why the slope (m) is the same between any two distinct points on a non-vertical line in the			
coordinate plane.			
d.) I can also derive the equation y = mx for a lin	e through the origin and the equation $y = mx + b$ for a line that intercepts the vertical axis		
at b.			
Key Idea: Analyze and solve linear equations a	nd pairs of simultaneous linear equations.		
Required Skills:			
a.) I can solve linear equations in one variable.			
b.) I can analyze and solve pairs of simultaneous	linear equations.		

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Key Idea: Define, evaluate, and compare functions.

Required Skills:

a.) I can understand that a function is a rule that assigns exactly one output to each input. The graph of a function is the set of ordered pairs, where each pair consists of an input and its corresponding output.

b.) I can compare the properties of two functions that are represented in different ways, such as algebraically, graphically, numerically in tables, or by verbal descriptions.

c.) I can interpret the equation y = mx + b as defining a linear function, where the graph is a straight line.

d.) I can also give examples of functions that are not linear.

Key Idea: Use functions to model relationships between quantities.

Required Skills:

a.) I can construct a function to model a linear relationship between two quantities.

- b.) I can determine the rate of change and initial value of the function from a description, two (x, y) values, or from a table or graph.
- c.) I can interpret the rate of change and initial value in terms of the situation it models, as well as from its graph or table of values.
- d.) I can describe the functional relationship between two quantities by analyzing a graph, such as identifying where the function is increasing or decreasing, and whether it is linear or nonlinear.
- e.) I can also sketch a graph that shows the qualitative features of a function based on a verbal description.

Standard: Geometry

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

Required Skills:

a.) I can verify experimentally the properties of rotations, reflections, and translations."

b.) "I can understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Given two congruent figures, I can describe the sequence of transformations that shows the congruence between them."

c.) "I can describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates."

d.) "I can understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of

rotations, reflections, translations, and dilations. Given two similar figures, I can describe the sequence of transformations that shows the similarity between them."

e.) "I can use informal arguments to establish facts about the angle sum and exterior angles of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for the similarity of triangles."

Key Idea: Understand and apply the Pythagorean Theorem. (8.G.B)

Required Skills:

a.) "I can explain a proof of the Pythagorean Theorem and its converse."

b.) "I can apply the Pythagorean Theorem to find unknown side lengths in right triangles, both in real-world and mathematical problems, in two and three dimensions."

c.) "I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system."

Key Idea: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. (8.G.C)

Required Skills:

a.) "I know the formulas for the volumes of cones, cylinders, and spheres, and I can use them to solve real-world and mathematical problems."

Standard: The Number System (8.NS)

Key Idea: Know that there are numbers that are not rational, and approximate them by rational numbers. (8.NS.A)

Required Skills:

a.) "I know that numbers that are not rational are called irrational. I understand that every number has a decimal expansion. For rational numbers, the decimal expansion repeats eventually, and I can convert a repeating decimal expansion into a rational number."

b.) "I can use rational approximations of irrational numbers to compare their size, locate them approximately on a number line, and estimate the value of expressions like π^2 ."

Standard: Statistics and Probability (8.SP)

Key Idea: Investigate patterns of association in bivariate data. (8.SP.A)

Required Skills:

a.) "I can construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. I can describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association."

b.) "I know that straight lines are often used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, I can informally fit a straight line and assess how well the model fits by judging how close the data points are to the line."

c.) "I can use the equation of a linear model to solve problems involving bivariate measurement data, and I can interpret the slope and intercept in the context of the situation."

d.) "I can understand that patterns of association in bivariate categorical data can be seen by displaying frequencies and relative frequencies in a two-way table. I can construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects and use relative frequencies to describe possible associations between the two variables."