

8th Grade Math Content Priority Academic Student Skills

Standard 1: Algebraic Reasoning: Patterns and Relationships - The student will graph and solve linear equations and inequalities in problem solving situations.	
8.1.1a	Equations - Model, write, and solve multi-step linear equations with one variable using a variety of methods to solve application problems.
8.1.1b	Equations - Graph and interpret the solution to one- and two-step linear equations on a number line with one variable and on a coordinate plane with two variables.
8.1.1c	Equations - Predict the effect on the graph of a linear equation when the slope or y-intercept changes (e.g., make predictions from graphs, identify the slope or y-intercept in the equation $y = mx + b$ and relate to a graph).
8.1.1d	Equations - Apply appropriate formulas to solve problems (e.g., $d=rt$, $I=prt$).
8.1.2	Inequalities - Model, write, solve, and graph one- and two-step linear inequalities with one variable.
Standard 2: Number Sense and Operation - The student will use numbers and number relationships to solve a variety of problems.	
8.2.1	Number Sense - Represent and interpret large numbers and numbers less than one in exponential and scientific notation.
8.2.2a	Number Operations - Use the rules of exponents, including integer exponents, to solve problems (e.g., $7^2 \cdot 7^3 = 7^5$, $3^{-10} \cdot 3^8 = 3^{-2}$).
8.2.2b	Number Operations - Solve problems using scientific notation.
8.2.2c	Number Operations - Simplify numerical expressions with rational numbers, exponents, and parentheses using order of operations.
Standard 3: Geometry - The student will use geometric properties to solve problems in a variety of contexts.	
8.3.1	Construct models, sketch (from different perspectives), and classify solid figures such as rectangular solids, prisms, cones, cylinders, pyramids, and combined forms.
8.3.2	Develop the Pythagorean Theorem and apply the formula to find the length of line segments, the shortest distance between two points on a graph, and the length of an unknown side of a right triangle.
Standard 4: Measurement - The student will use measurement to solve problems in a variety of contexts.	
8.4.1	Develop and apply formulas to find the surface area and volume of rectangular prisms, triangular prisms, and cylinders (in terms of pi).
8.4.2	Apply knowledge of ratio and proportion to solve relationships between similar geometric figures.
8.4.3	Find the area of a "region of a region" for simple composite figures and the area of cross sections of regular geometric solids (e.g., area of a rectangular picture frame).
Standard 5: Data Analysis - The student will use data analysis, probability, and statistics to interpret data in a variety of contexts.	
8.5.1	Data Analysis - Select, analyze and apply data displays in appropriate formats to draw conclusions and solve problems.
8.5.2*	Probability - Determine how samples are chosen (random, limited, biased) to draw and support conclusions about generalizing a sample to a population (e.g., is the average height of a men's college basketball team a good representative sample for height predictions?).
8.5.3	Central Tendency - Find the measures of central tendency (mean, median, mode, and range) of a set of data and understand why a specific measure provides the most useful information in a given context.

Process Standard 1: Problem Solving	
MS.1.1	Develop and test strategies to solve practical, everyday problems which may have single or multiple answers.
MS.1.2	Use technology to generate and analyze data to solve problems.
MS.1.3	Formulate problems from situations within and outside of mathematics and generalize solutions and strategies to new problem situations.
MS.1.4	Evaluate results to determine their reasonableness.
MS.1.5	Apply a variety of strategies (e.g., restate the problem, look for a pattern, diagrams, solve a simpler problem, work backwards, trial and error) to solve problems, with emphasis on multistep and non-routine problems.
MS.1.6	Use oral, written, concrete, pictorial, graphical, and/or algebraic methods to model mathematical situations.
Process Standard 2: Communication	
MS.2.1	Discuss, interpret, translate (from one to another) and evaluate mathematical ideas (e.g., oral, written, pictorial, concrete, graphical, algebraic).
MS.2.2	Reflect on and justify reasoning in mathematical problem solving (e.g., convince, demonstrate, formulate).
MS.2.3	Select and use appropriate terminology when discussing mathematical concepts and ideas.
Process Standard 3: Reasoning	
MS.3.1	Identify and extend patterns and use experiences and observations to make suppositions.
MS.3.2	Use counter examples to disprove suppositions (e.g., all squares are rectangles, but are all rectangles squares?).
MS.3.3	Develop and evaluate mathematical arguments (e.g., agree or disagree with the reasoning of other classmates and explain why).
MS.3.4	Select and use various types of reasoning (e.g., recursive [loops], inductive [specific to general], deductive [general to specific], spatial, and proportional).
Process Standard 4: Connections	
MS.4.1	Apply mathematical strategies to solve problems that arise from other disciplines and the real world.
MS.4.2	Connect one area or idea of mathematics to another (e.g., relates equivalent number representations to each other, relate experiences with geometric shapes to understanding ratio and proportion).
Process Standard 5: Representation	
MS.5.1	Use a variety of representations to organize and record data (e.g., use concrete, pictorial, and symbolic representations).
MS.5.2	Use representations to promote the communication of mathematical ideas (e.g., number lines, rectangular coordinate systems, scales to illustrate the balance of equations).
MS.5.3	Develop a variety of mathematical representations that can be used flexibly and appropriately (e.g., base-10 blocks to represent fractions and decimals, appropriate graphs to represent data).
MS.5.4	Use a variety of representations to model and solve physical, social, and mathematical problems (e.g., geometric objects, pictures, charts, tables, graphs).