MIDDLE SCHOOL

8TH MATH

Mathematical Practices

The Standards for Mathematical Practice are essential in the extension of mathematical thinking. Students develop these habits of mind through specific, intentional experiences of writing, reading, talking, and reasoning that connect mathematics to their daily lives and career situations. All of the Standards are important for all quality math courses:

- Make sense of problems and persevere in solving them (MP.1)
- Reason abstractly and quantitatively (MP.2)
- Construct viable arguments and critique the reasoning of others (MP.3)
- Modeling with mathematics (MP.4)
- Use appropriate tools strategically (MP.5)
- Attend to precision (MP.6)
- Look for and make use of structure (MP.7)
- Look for and express regularity in repeated reasoning (MP.8)

In Grade 8, instructional time should focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equations, and solving linear equations and systems of linear equations; (2) grasping the concept of a function dn using functions to describe quantitative relationships; and (3) analyzing two-and three-dimensional space and figures using distance, angle, similarity,and congruence, and understanding and applying the Pythagorean Theorem.

Content Area: Number System

- Know that not all numbers are rational and approximate them by using rational numbers.

Standards	Strands	Goals and Performance Objectives
8.M.NS.1	Chps. 7	Understand that every number has a decimal expansion.
8.M.NS.2	Chps. 7	Use rational approximations of irrational numbers to compare the size, location on the number line and estimate the value of an expression.

Content Area: Expressions and Equations • Work with radicals and integer exponents; understand the connections between proportional relationships, lines and linear equations; solve linear equations with one variable, coefficients and a system of two linear equations.		
8.M.EE.1	Chps.10	Apply properties of integer exponents to generate equivalent numerical expressions.
8.M.EE.2	Chps. 7	Use square and cube root symbols to represent solutions to equations.
8.M.EE.3	Chps. 10	Use numbers expressed in the form of single digit time a whole-number power of 10 to estimate large or small quantities.
8.M.EE.4	Chps. 10	Perform operations with numbers expressed in scientific notation.
8.M.EE.5	Chps. 4	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships.
8.M.EE.6	Chps.4	Use similar triangles to explain why the slope is the same between any two distinct points on a non-vertical line in the coordinate plane; derive y=mx and y=mx + b.
8.M.EE.7	Chps. 1	Solve linear equations in one variable.
8.M.EE.8	Chps. 5	Analyze and solve pairs of simultaneous linear equations

Content Area: Geometry • Understand congruence and similarity.		
8.M.G.1	Chps. 2	Verify the properties of rotations, reflections and translations.
8.M.G.2	Chps. 2	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.
8.M.G.3	Chps.2	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures from a variety of cultural contexts using coordinates.
8.M.G.4	Chps.2	Understand 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 two-dimensional figures, describe a sequence that exhibits the similarity between them.
8.M.G.5	Chps.3	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about angles created when parallel lines are cut by a transversal, and the angle criterion for similarity of triangles.
8.M.G.6	Chps. 7	Explain a proof of the Pythagorean Theorem and its converse
8.M.G.7	Chps. 7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world problems.
8.M.G.8	Chps. 7	Apply the Pythagorean Theorem to find the distance between two points in the coordinate system.
8.M.G.9	Chps. 8	Understand and use the formulas for volumes of cones, cylinders, and spheres to solve real world problems.

Content Area: Functions • Define, evaluate,and compare functions; use functions to model relationships between quantities.		
8.M.F.1	Chps. 6	Understand a function is a rule that assigns to each input exactly one output.
8.M.F.2	Chps. 6	Compare properties of two functions each represented in a different way.
8.M.F.3	Chps. 6	Interpret y=mx + B as a linear function; give examples of functions that are not linear.

8.M.F.4	Chps. 4 & 6	Construct a function to model a linear relationship between two quantities. Interpret rate of change and initial value of a linear function from 2 values, table or from a graph.
8.M.F.5	Chps. 6	Describe qualitatively the functional relationship between two quantities by analyzing a graph; sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Content Area: Statistics and Probability • Analyze Bivariate Data		
8.M.SP.1	Chps. 9	Construct and interpret scatter plots for bivariate data to investigate patterns between two quantities.
8.M.SP.2	Chps. 9	Know and create best lines of fit to informally assess the model.
8.M.SP.3	Chps. 9	Use a linear equation to solve problems of bivariate measurement data, interpreting slope and intercept.
8.M.SP.4	Chps. 9	Construct and interpret patterns on a two-way table summarizing data on two categorical variables. Use relative frequencies to describe association between the categories.