**PACING GUIDE**

**COURSE:** **Math 8**  **GRADE(S): 8**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **MONTH/DAYS** | **UNIT #** | **STANDARDS** | **CONTENT**  Topics being covered? What do students need to know? (*nouns*) | **ACTIVITIES**  w/Integration of Technology & Career Ready Practices | **ASSESSMENTS**  What evidence (formative/summative) is utilized to establish that the content, standards, & skills have been mastered? |
| Sept  (30 days) | 1 | MA.8.8.G.A Understand congruence and similarity  MA.8.8.G.A.1  Verify experimentally the properties of rotations, reflections, and translations:  MA.8.8.G.A.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; given two congruent figures, describe a sequence that exhibits the congruence between them. MA.8.8.G.A.3  Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. MA.8.8.G.A.5  Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. | Symmetry Transformations  Classifying Angles  Determining Similar Triangles  Dilations  Parallel Lines cut by a transversal  Reflection Symmetry  Rotation Symmetry  Symmetry in Kaleidoscopes Transforming Coordinates  Translation Symmetry | Investigation: Interior angles of a triangle  Investigation: Transformations  Investigation: Symmetry  Classifying Angles | Project - Name Kaleidoscope  Quiz - Translations  Test - Transformations  Project - Tessellation  Project Based Assessment - Design a Town (Intersecting Lines)  Quiz - Angle Relationships  Quiz - Rotations  Self-Assessment  Tests - Angle Relationships |
| October  (30 days) | 2 | MA.8.8.EE.A  Work with radicals and integer exponents. MA.8.8.EE.A.2  Use square root and cube root symbols to represent solutions to equations of the form x² = p and x³ = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational. MA.8.8.EE.A.3  Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. MA.8.8.EE.A.4  Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.Interpret scientific notation that has been generated by technology. MA.8.8.NS.A  Know that there are numbers that are not rational, and approximate them by rational numbers. MA.8.8.NS.A.1 Know that numbers that are not rational are called irrational  MA.8.8.NS.A.2  Use rational approximations of irrational numbers to compare the size of irrational numbers. | Apply the properties of integer exponents to simplify and write equivalent numerical expressions.  Compare rational and irrational numbers to demonstrate that the decimal expansion of irrational numbers do not repeat; show that every rational number has a decimal expansion which eventually repeats and covert such decimals into rational numbers.  In real-world problem solving situations choose units of appropriate size for measurement of very small and very large quantities.  Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used (interpret scientific notation generated when technology has been used for calculations).  Use rational numbers to approximate and locate irrational numbers on a number line and estimate the value of expressions involving irrational numbers.  Use scientific notation to estimate and express the values of very large or very small numbers and compare their values (how many times larger/smaller is one than the other). | Approximating Square Roots   Classifying Numbers   Operations with numbers in scientific notation   Properties of integer exponents   Repeating and Terminating Decimals   Simplifying Expressions   Writing numbers in scientific notation | Project Based Assessment - Represent real world numbers in scientific notation  Quiz - scientific notation  Test - Classifying and ordering numbers  K Chart: Scientific Notation https://docs.google.com/document/d/12LkHRP5S53CayIzYrQgnGEAOU6lbCd8L\_nuFxx7ncvA/edit  Marking Period Assessment  Quiz - rational/irrational numbers  Self-Assessment |
| (40 days) | 3 | MA.8.8.EE.B Understand the connections between proportional relationships, lines, and linear equations. MA.8.8.EE.C  Analyze and solve linear equations and pairs of simultaneous linear equations. MA.8.8.EE.C.8  Analyze and solve pairs of simultaneous linear equations. MA.8.8.F.A  Define, evaluate, and compare functions. | Compare two functions each represented in a different way (numerically, verbally, graphically, and algebraically) and draw conclusions about their properties (rate of change and intercepts).   Construct and interpret scatter plots for bivariate measurement data and identify and interpret data patterns (clustering, outliers, positive or negative association, possible lines of best fit, and nonlinear association).  Construct frequency/relative frequency tables to analyze and describe possible associations between two variables.  Define linear functions as a rule that assigns one output to each input and determine if data represented as a graph or in a table is a function.  Using a linear equation to model real life problems then solve it by interpreting the meaning of the slope and the intercept  Utilize equations, graphs, and tables to classify functions as linear or non-linear, recognizing that y = mx + b is linear with a constant rate of change. | Best Fit Lines  Functions  Graphing Linear Equations Using Intercepts  Linear Equations in Two Variables  Rate of Change  Slope  Slope-Intercept Form  Writing Linear Equations | Project - Line Design  Test - Functions  Quiz - Slope-Intercept Form |
| (40 days) | 4 | MA.8.8.EE Expressions and Equations  MA.8.8.EE.B Understand the connections between proportional relationships, lines, and linear equations.  MA.8.8.EE.C  Analyze and solve linear equations and pairs of simultaneous linear equations.  MA.8.8.EE.C.8  Analyze and solve pairs of simultaneous linear equations. | Construct a function to model the linear relationship between two variables and determine the rate of change and initial value of the real world data it represents from either graphs or tabulated values  Derive the equation of a line (y = mx for a line through the origin and the equation y = mx +b for a line intercepting the vertical axis at b) and use similar triangles to explain why the slope (m) is the same between any two points on a non-vertical line in the coordinate plane  Graph and analyze the different representations of proportional relationships and interpret the unit rate as the slope of the graph which indicates the rate of change.  Sketch a graph of a function from a qualitative description and give a qualitative description of a graph of a function.  Solve linear equations in one variable with rational number coefficients that might require expanding expressions using the distributive property and/or combining like terms, including examples with one solution, infinite solutions, or no solution.  Solve systems of linear equations in two variables by inspection, algebraically, and/or graphically (estimate solutions) to demonstrate solutions correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. | Determine the equation of a line in multiple ways  Exploring Patterns with Lines  Finding the point of intersection  Solving Linear Equations  Solving Systems of Equations  Special Linear Equations | Test - Table, Graphs, Equations  Project - Line Design  Project - Stained Glass Window  Project Based Assessment  Quiz - Graphing Lines  Quiz - Slope  Quiz - Systems of Equations  Quiz - Tables, Graphs, Equations  Self-Assessment  Test - Graphing Lines from multiple forms |
| (20 days) | 5 | MA.8.8.EE.A.2  Use square root and cube root symbols to represent solutions to equations of the form x² = p and x³ = p, MA.8.8.G.B Understand and apply the Pythagorean Theorem. MA.8.8.G.B.6  Explain a proof of the Pythagorean Theorem and its converse. MA.8.8.G.B.7  Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. MA.8.8.G.B.8  Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. MA.8.8.G.C  Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. MA.8.8.G.C.9  Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | • Evaluate square roots and cubic roots of small perfect squares and cubes respectively.  Explain a proof of the Pythagorean Theorem and its converse.    Know and apply the appropriate formula for the volume of a cone, a cylinder, or a sphere to solve real-world and mathematical problems.  Use the Pythagorean Theorem to determine the distance between two points in the coordinate plane.  Utilize the Pythagorean Theorem to determine unknown side lengths of right triangles in two and three dimensions to solve real-world and mathematical problems. | Analyzing Right Triangles  Baseball Diamond  Comparing Spheres and Cylinders  Cones and Cylinders, Pyramids and Cubes  Filling Cylinders  Filling Fancy Boxes  Filling Rectangular Boxes  Finding Areas CM Lesson  Finding Distances  Finding perimeter using Pythagorean Theorem  Looking for Squares CM  Making Cylinders and Prisms from Nets  Making a New Container  Measuring the Egyptian Way: converse of the Pythagorean Theorem  Melting Ice Cream  Packaging Blocks  Planning Parks in Euclid CM Lesson  Proof of the Pythagorean Theorem  The Pythagorean Theorem  Using Squares to Find Lengths  Wheel of Theodorus | Project Based Assessment - Wheel of Theodorus    Quiz - Pythagorean Theorem  Test - 3-D Geometry  Marking Period Assessment  Project - Volume of student created rocket  Stations - Measure and calculate volume of 3-D figures  Test - Pythagorean Theorem |
| (20 days) | 6 | MA.8.8.SP.A Investigate patterns of association in bivariate data.  MA.8.8.SP.A.1  Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities.  MA.8.8.SP.A.2  Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.  MA.8.8.SP.A.3  Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.  MA.8.8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. | Define experiment, outcome, event, probability and equally likely.  Determine the outcomes and probabilities for experiments.  Distinguish between an event and an outcome for an experiment.  Interact with die rolls and spinners to help predict the outcome of experiments.  Make scatter plots based on data and determine the line of best fit  Recognize the difference between outcomes that are equally likely and not equally likely to occur. | Box-and-Whisker plots  Constructing and analyzing stem and leaf plots  Constructing circle graphs  Counting Principle of Multiplication  Experimental & theoretical probability  Fairness of games  Independent/compound events involving probability  Intro. to bar graphs, scatter plots, histograms, line plots, & circle graphs  Intro. to expected value  Measures of central tendency  Permutations and combinations  Polls, surveys, & sampling  Vertex edge graphs | Performance Assessment - Design a probability game  Test - Probability  Test - Statistics |