



2023–2024 Jackson County Schools 8th Grade Mathematics Pacing Guide

1st Quarter

Rational Numbers, Irrational Numbers

Standard 8.1 - Rational Numbers [Proficiency Scale](#)

[8.NS.1.] Define the real number system as composed of rational and irrational numbers.

Standard 8.1a - Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates.

Standard 8.1b - Convert a decimal expansion that repeats into a rational number.

Standard 8.2 - Estimating Irrational Numbers [Proficiency Scale](#)

[8.NS.2.] Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers.

Exponents and Scientific Notation

***Focus Standard 8.3 - Understand Properties of Integer Exponents and Laws of Exponents** [Proficiency Scale](#)

[8.EE.1.] Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions.

Standard 8.4 - Square and Cube Roots [Proficiency Scale](#)

[8.EE.2.] Use square root and cube root symbols to represent solutions to equations.

Standard 8.4a - Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1000).

Standard 8.4b - Explain that the square root of a non-perfect square is irrational.

Standard 8.5 - Scientific Notation

[8.EE.3.] Estimate and compare very large or very small numbers in scientific notation.

Standard 8.6 - Computing with Scientific Notation [Proficiency Scale \(5/6\)](#)

[8.EE.4.] Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.

Standard 8.6a - Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.

Standard 8.6b - Interpret scientific notation that has been generated by technology. (e.g., use millimeters per year for seafloor spreading).

Functions

Standard 8.13 - Definition of a Function [Proficiency Scale](#)

Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. [8-F1]

Standard 8.14 - Analyzing Linear Relationships [Proficiency Scale](#)

Evaluate functions defined by a rule or an equation, given values for the independent variable.

For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. [8-F2]

2nd Quarter

Linear Relationships: Slope, Linear Equations, and Systems

Standard 8.7 - Proportional vs. Non Proportional [Proficiency Scale](#)

[8.EE.5.] Determine whether a relationship between two variables is proportional or non-proportional.

***Focus Standard 8.8 - Constant Rate of Change [Proficiency Scale](#)**

[8.EE.5.] Graph proportional relationships.

Standard 8.8a - Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation $y = mx$ where m is the slope. Example: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Standard 8.9 - Slope-Intercept Form [Proficiency Scale](#)

[8.EE.6.] Interpret $y = mx + b$ as defining a linear equation whose graph is a line with m as the slope and b as the y -intercept.

Standard 8.9a - Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in a coordinate plane.

Standard 8.9b - Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line.

Standard 8.9c - Graph linear relationships, interpreting the slope as the rate of change of the graph and the y -intercept as the initial value.

Standard 8.9d - Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different y -intercepts.

***Focus Standard 8.10 - Comparing Proportional Relationships [Proficiency Scale](#)**

Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.

***Focus Standard 8.15 - Linear vs. Nonlinear Functions**

[8.F.3] Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.

Standard 8.15a - Distinguish between linear and nonlinear functions.

***Focus Standard 8.17 - Qualitative Graphs [Proficiency Scale \(15/17\)](#)**

Analyze the relationship (increasing or decreasing, linear or nonlinear) between two quantities represented in a graph.[8-F5]

***Focus Standard 8.16 - Constructing a Linear Equation [Proficiency Scale](#)**

Construct a function to model a linear relationship between two variables.

Standard 8.16a - Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph. [8-F4]

3rd Quarter

Linear Relationships: Slope, Linear Equations, and Systems

***Focus Standard 8.11 - Solving Equations in One Variable [Proficiency Scale](#)**

Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms [8-EE7]

Standard 8.11a - Solutions to Equations

Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form $x = a$, $a = a$, or $a = b$ (where a and b are different numbers) [8-EE7a]

Standard 8.11b - Solving Real-World Problems with Equations

Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem. [8-EE7b]

***Focus Standard 8.12 - Simultaneous Linear Equations [Proficiency Scale](#)**

Solve systems of two linear equations in two variables by graphing and substitution. [8-EE8]

Standard 8.12a - Points of Intersection (Graphing)

Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously. [8-EE8a]

Standard 8.12b - Real-World Problems

Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.[8-EE8b]

Example: Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Pythagorean Theorem

Standard 8.26 - Understanding the Pythagorean Theorem

[8.G.6.] . Informally justify the Pythagorean Theorem and its converse.

Standard 8.27 - Applying the Pythagorean Theorem

Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane. [8-G7]

***Focus Standard 8.28 - Finding Distance [Proficiency Scale](#)**

Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications[8-G8]

Geometric Figures: Rigid Transformations, Congruence, Similarity, and Angle Relationships**Standard 8.22 - Visual Exploration of Transformations**

Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines.

Standard 8.22a - Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship. [8-G1]

***Focus Standard 8.23 - Coordinates Effects of Transformations [Proficiency Scale](#)**

Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two-dimensional figures. [8-G3]

Standard 8.24 - Determining Similarity of Figures

Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them. [8-G4]

***Focus Standard 8.25 - Angles formed by Parallel Lines cut by a Transversal [Proficiency Scale](#)**

Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures.

Standard 8.25a - Angles of Triangles

Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees. [8-G5]

4th Quarter

Two-Variable Data and Additional Standards**Standard 8.18 - Scatter Plots [Proficiency Scale](#)**

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and nonlinear association, clustering, and outliers. [8-SP1]

Standard 8.19 - Lines of Best Fit [Proficiency Scale](#)

Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and assess the model fit by judging the closeness of the data points to the line. [8-SP2]

Standard 8.20 - Applying Lines of Best Fit [Proficiency Scale](#)

[8.SP.3.] Use a linear model of a real-world situation to solve problems and make predictions.

Standard 8.20a - Describe the rate of change and y-intercept in the context of a problem using a linear model of a real-world situation. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Standard 8.21 - Two-Way Tables [Proficiency Scale](#)

[8.SP.4.] Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables.

Standard 8.29 - Volume of Cones, Cylinders, and Spheres

[8.G.9.] Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions.

Standard 8.30 - Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real world problems.