Pacing Guide

- Build Conceptual Understanding
- Connect Concepts and Skills
- Apply and Practice

Lesson	Mathematics Standards, Grade 8	Pacing
Unit 1 TRANSFORMATIONAL GEOMETRY		
Module 1: Transformations and Congruence		
Lesson 1.1 Investigate Transformations	■ Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. ■ Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure. ■ Verify experimentally the properties of rotations, reflections, and translations: Parallel lines are taken to parallel lines.	2 days
Lesson 1.2 Explore Translations	■ Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. ■ Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure. ■ Verify experimentally the properties of rotations, reflections, and translations: Parallel lines are taken to parallel lines. ■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days
Lesson 1.3 Explore Reflections	■ Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. ■ Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure. ■ Verify experimentally the properties of rotations, reflections, and translations: Parallel lines are taken to parallel lines. ■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days
Lesson 1.4 Explore Rotations	■ Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. ■ Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure. ■ Verify experimentally the properties of rotations, reflections, and translations: Parallel lines are taken to parallel lines. ■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days

■ Major ☐ Supporting ○ Additional	**In addition to the core instructional pacing below, HMH recommends the following:** • 3 days per year for the HMH Into Math Growth Measure powered by Math Inventory • 3 days per module for the Module Opener, Are You Ready?, Module Review, and Module Test • 2 days per unit for the Performance Task Using these recommendations, the total pacing for Grade 8 is 154 days.

Lesson	Mathematics Standards, Grade 8	Pacing
Lesson 1.5 Understand and Recognize Congruent Figures	■ 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. ■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days
Module 2: Transformations and Similarity		
Lesson 2.1 Investigate Reductions and Enlargements	■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days
Lesson 2.2 Explore Dilations	■ Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	2 days
Lesson 2.3 Understand and Recognize Similar Figures	■ 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 two-dimensional figures, describe a sequence that exhibits the similarity between them.	2 days
Unit 2 LINEAR EQUATIONS AND APPLICATIONS		
Module 3: Solve Linear Equations		
Lesson 3.1 Solve Multi-step Linear Equations	■ Solve linear equations in one variable. ■ Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	2 days
Lesson 3.2 Examine Special Cases	■ Solve linear equations in one variable. ■ Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). ■ Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	2 days
Lesson 3.3 Apply Linear Equations	■ Solve linear equations in one variable. ■ Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). ■ Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	2 days

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Module 4: Angle Relationships		
Lesson 4.1 Develop Angle Relationships for Triangles	■ 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.	2 days
Lesson 4.2 Investigate Angle-Angle Similarity	■ 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.	2 days
Lesson 4.3 Explore Parallel Lines Cut by a Transversal	■ 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.	2 days
Unit 3: RELATIONSHIPS AND FUNCTIONS		
Module 5: Proportional Relationships		
Lesson 5.1 Explain Slope with Similar Triangles	■ 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; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	2 days
Lesson 5.2 Derive $y = mx$	■ Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. ■ 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; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	2 days
Lesson 5.3 Interpret and Graph Proportional Relationships	■ Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	2 days
Lesson 5.4 Compare Proportional Relationships	■ Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	2 days

Major | Supporting | Additional

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Module 6: Understand and Analyze Functions		
Lesson 6.1 Understand and Graph Functions	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	2 days
Lesson 6.2 Derive and Interpret $y = mx + b$	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; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.	2 days
Lesson 6.3 Interpret Rate of Change and Initial Value	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	2 days
Lesson 6.4 Construct Functions	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	2 days
Lesson 6.5 Compare Functions	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	2 days
Lesson 6.6 Describe and Sketch Nonlinear Functions	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	2 days

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Module 7: Systems of Linear Equations		
Lesson 7.1 Represent Systems by Graphing	Analyze and solve pairs of simultaneous linear equations.	2 days
Lesson 7.2 Solve Systems by Graphing	Analyze and solve pairs of simultaneous linear equations. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	2 days
Lesson 7.3 Solve Systems by Substitution	Analyze and solve pairs of simultaneous linear equations. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	2 days
Lesson 7.4 Solve Systems by Elimination	Analyze and solve pairs of simultaneous linear equations. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	2 days
Lesson 7.5 Examine Special Systems	Analyze and solve pairs of simultaneous linear equations. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	2 days
Lesson 7.6 Apply Systems of Equations	Analyze and solve pairs of simultaneous linear equations. Solve real-world and mathematical problems leading to two linear equations in two variables.	2 days

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Unit 4 STATISTICS AND PROBABILITY		
Module 8: Scatter Plots		
Lesson 8.1 Construct Scatter Plots and Examine Association	(Supporting) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	2 days
Lesson 8.2 Draw and Analyze Trend Lines	(Supporting) 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 by judging the closeness of the data points to the line.	2 days
Lesson 8.3 Interpret Linear Data in Context	(Supporting) Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. (Major) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	2 days
Module 9: Two-Way Tables		
Lesson 9.1 Construct and Interpret Two-Way Frequency Tables	(Supporting) Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	2 days
Lesson 9.2 Construct Two-Way Relative Frequency Tables	(Supporting) Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	2 days
Lesson 9.3 Interpret Two-Way Relative Frequency Tables	(Supporting) Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	2 days

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Unit 5 REAL NUMBERS AND THE PYTHAGOREAN THEOREM		
Module 10: Real Numbers		
Lesson 10.1 Understand Rational and Irrational Numbers	☐ Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	2 days
Lesson 10.2 Investigate Roots	■ Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	2 days
Lesson 10.3 Order Real Numbers	☐ Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).	2 days
Module 11: The Pythagorean Theorem		
Lesson 11.1 Prove the Pythagorean Theorem	■ Explain a proof of the Pythagorean Theorem and its converse. ■ Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	2 days
Lesson 11.2 Prove the Converse of the Pythagorean Theorem	■ Explain a proof of the Pythagorean Theorem and its converse. ■ Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	2 days
Lesson 11.3 Apply the Pythagorean Theorem	■ Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	2 days
Lesson 11.4 Apply the Pythagorean Theorem in the Coordinate Plane	■ Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	2 days

Major | Supporting | Additional

Lesson		Mathematics Standards, Grade 8	Pacing
Unit 6 EXPONENTS, SCIENTIFIC NOTATION, AND VOLUME			
Module 12: Exponents and Scientific Notation			
Lesson 12.1 Know and Apply Properties of Exponents	Major	Know and apply the properties of integer exponents to generate equivalent numerical expressions.	2 days
Lesson 12.2 Understand Scientific Notation	Major	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.	2 days
Lesson 12.3 Compute with Scientific Notation	Major	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	2 days
Module 13: Volume			
Lesson 13.1 Find Volume of Cylinders	Additional	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	2 days
Lesson 13.2 Find Volume of Cones	Additional	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	2 days
Lesson 13.3 Find Volume of Spheres	Additional	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	2 days
Lesson 13.4 Apply Volume	Additional	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	2 days

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