

| Unit | Lesson | Lesson Objectives |
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**The Number System****Exploring Real Numbers**

- Classify numbers as rational or irrational numbers, and decimals as terminating or repeating.
- Determine sums and products of rational and irrational numbers.
- Express a repeating decimal with bar notation, and convert it to a fraction.

**Estimating and Comparing Square Roots**

- Estimate square roots without using technology.
- Make comparative statements involving square roots.
- Plot the estimated values of square roots on a number line.

**Expressions and Equations****Zero and Negative Exponents**

- Determine patterns of exponent values from a table.
- Evaluate powers of zero and negative exponents.
- Simplify expressions of zero and negative exponents.

**Raising a Power to a Power**

- Simplify and evaluate expressions of raising a power to a power of integer exponents.

**Spherical and Cubic Volume Applications**

- Apply volume formulas, including those that evaluate perfect cubes, to find unknown measurements.
- Recognize perfect cubes.
- Solve a real-world problem utilizing the formula for volume of a sphere.

**Finding the Hypotenuse in Right Triangles**

- Approximate the length of the hypotenuse of a right triangle to solve real-world problems.
- Use the Pythagorean theorem to find the length of the hypotenuse of a right triangle.

**Introduction to Scientific Notation**

- Convert very small or very large numbers between scientific notation and standard notation.
- Order and estimate products and quotients of numbers written in scientific notation.

**Operations with Scientific Notation**

- Evaluate products and quotients of scientific notation values.
- Identify proper units of measurement for quantities written in scientific notation.
- Recognize scientific notation answers generated by technology and identify the symbols associated with the value.

**Proportional Relationships**

- Compare proportional and nonproportional linear functions in the form of a table, graph, and equation.
- Determine whether a linear function is a direct variation.
- Solve problems involving direct variation.

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**Rate of Change and Introduction to Slope**

- Compare positive slopes in a real-world situation.
- Determine the positive slope of a line from a table and a graph.

**Similar Triangles and Slope**

- Find unknown measurements of similar triangles.
- Interpret similar triangles created by intersecting transversal and parallel lines.
- Use similar triangles in the coordinate plane to write linear equations.

**Analyzing Solutions**

- Identify equations that have one solution, infinitely many solutions, and no solution.
- Solve equations that have one solution, infinitely many solutions, and no solution.
- Write equations that have infinitely many solutions and no solution.

**Solving with the Distributive Property**

- Justify the steps taken to solve one-variable linear equations involving the distributive property.
- Solve one-variable linear equations using the distributive property.

**Using Graphs to Solve Systems**

- Determine the solution of a linear system from the graph.
- Graph linear systems on the coordinate plane.
- Rewrite a system of linear equations in slope-intercept form.

**Estimating Solutions of Systems**

- Estimate solutions of linear systems graphically.
- Use intercepts to graph a system of equations given in standard form.

**Using Substitution to Solve Systems**

- Use substitution to solve a linear system.

**Writing and Solving Systems**

- Create systems of equations from mathematical problems.
- Solve systems of two linear equations.

**Problem Solving with Systems**

- Solve a system of linear equations.
- Write a system of linear equations to represent a real-world scenario.

**Functions****Introduction to Functions**

- Determine if a real-world situation describes a functional relationship.
- Identify functions from tables, graphs, and equations.

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**Linear vs. Nonlinear Functions**

- Differentiate functions as either linear or nonlinear.
- Interpret the rate of change from a graph or table.

**Slope-Intercept Form**

- Analyze a graph to determine slope and  $y$ -intercept.
- Graph a linear function using the slope and  $y$ -intercept.
- Write a linear equation in slope-intercept form given the slope and  $y$ -intercept.

**Constructing Linear Functions**

- Analyze linear functions to find the rate of change and initial value.
- Interpret the rate of change and initial value of a linear function in terms of the situation it models.

**Interpreting Graphs**

- Analyze qualitative graphs.
- Create a graph to model a situation.
- Interpret information given in a graph.

**Geometry****Congruence**

- Determine the congruence of figures by measuring corresponding sides and angles.
- Identify and write corresponding parts of congruent figures.

**Overview of Transformations**

- Identify types of transformations.
- Relate the result of a transformation to the original figure.

**Congruence and Transformations**

- Describe a sequence of transformations that shows that a given pre-image is congruent to a transformed figure.

**Translations**

- Describe a translation using coordinates.
- Identify and describe a translation on the coordinate plane.
- Translate figures on the coordinate plane given as an ordered pair and verbal expression.

**Reflections**

- Describe a reflected figure using the line of reflection and coordinates.
- Identify and describe a reflection on the coordinate plane.
- Reflect figures on the coordinate plane given the line of reflection.

**Rotations in the Coordinate Plane**

- Describe the rotation of a figure using coordinates.
- Rotate figures on the coordinate plane given the degree and direction.

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**Dilations in the Coordinate Plane**

Describe the dilation of a figure on the coordinate plane by the scale factor.

Use the scale factor to graph dilations on the coordinate plane.

**Similarity and Transformations**

Apply scale factor to find unknown side lengths of an image or pre-image after a dilation or sequence of transformations.

Describe a sequence of transformations that result in a similar figure.

Determine the similarity of figures by comparing corresponding side lengths and angle measures.

**Parallel Lines Cut by a Transversal**

Determine if two lines cut by a transversal are parallel.

Find missing measurements using angle relationships in a diagram of a transversal crossing parallel lines.

Identify interior angles, exterior angles, alternate interior angles, and alternate exterior angles when a transversal crosses parallel lines.

**Sum of Interior Angles of a Triangle**

Determine the angle measures of interior angles of a triangle.

Explain that the sum of the interior angles of a triangle is 180 degrees by rearranging the angles to create a straight line.

Use angle relationships formed from parallel lines cut by transversals to establish facts about the interior angles of a triangle.

**Exterior Angles of a Triangle**

Determine angle measures of exterior angles of a triangle and the sum of exterior angles of a triangle.

Identify exterior, adjacent interior, and remote interior angles of a triangle.

Use angle relationships to establish facts about exterior angles of a triangle.

**Similar Triangles**

Analyze and apply third angle theorem and angle-angle criterion in similar triangles.

Identify proportionality of side lengths to determine triangle similarity.

Write similarity statements of similar triangles.

**Exploring the Pythagorean Theorem**

Apply the Pythagorean theorem using Pythagorean triples as the side lengths.

Identify sets of Pythagorean triples.

Recognize perfect squares.

Use Pythagorean triples to determine if a triangle is a right triangle.

**Converse to the Pythagorean Theorem**

Determine if a triangle is a right triangle by using the converse of the Pythagorean theorem.

**Unknown Leg Lengths in Right Triangles**

Approximate the length of a leg of a right triangle to solve real-world problems.

Given the length of one leg and the hypotenuse of a right triangle, use the Pythagorean theorem to find the length of the other leg.

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**Pythagorean Theorem in Three Dimensions**

- Identify diagonals and right triangles within cubes.
- Solve for unknown side lengths of right triangles within a cube.

**Finding Distance in the Coordinate Plane**

- Apply the Pythagorean theorem to find the distance between two points on the coordinate plane.
- Generate and use the distance formula to find the distance between two points on the coordinate plane.

**Applications with the Volume of a Cylinder**

- Find unknown dimensions of a cylinder given its volume.
- Solve real-life problems using the volume of cylinders.

**Applications with the Volume of a Cone**

- Find unknown dimensions of a cone given its volume.
- Solve a real-world problem utilizing the formula for volume of a cone.

**Introduction to the Volume of a Sphere**

- Apply the formula to find the volume of a sphere.
- Connect the volume of a sphere to the volume of a cylinder.
- Identify the parts of a sphere.

**Statistics and Probability****Interpreting Clusters and Outliers**

- Analyze the influence outliers and clusters have on the data set.
- Explain the meaning of clusters and outliers in context.
- Identify clusters and outliers in a scatterplot and table of values.

**Exploring Association**

- Analyze the correlation and association in scatterplots.

**Drawing Trend Lines**

- Draw a line of best fit in scatterplots and identify its purpose.
- Use a graphing calculator to graph scatterplots and draw the trend line.

**Making Predictions**

- Analyze data to determine interpolations and extrapolations.
- Substitute  $x$ - and  $y$ -values into the data to create predictions of a real-world scenario.
- Use a calculator to graph a scatterplot and create line of best fit.

**Making Two-Way Tables**

- Create a two-way table that organizes bivariate data.
- Determine the variables of a scenario in bivariate data.
- Label components of the two-way table appropriately.

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**Interpreting Two-Way Tables**

Interpret and analyze a two-way table.

Use frequencies to describe a possible association between two variables.