	Cluster	I Can…	Key Vocabulary
The Number System	Know that there are numbers that are not rational, and approximate them by rational numbers.	• Know that numbers that are not rational are called **irrational**. • Understand informally that every number has a **decimal expansion**. • Show, for **rational numbers**, that the **decimal expansion** repeats eventually. • Convert a **decimal expansion** which repeats eventually into a **rational number**. • Use rational approximations of **irrational numbers** to compare the size of **irrational numbers**. • Locate **irrational numbers** approximately on a number line diagram. • Estimate the value of **irrational expressions** (e.g., π^2). *For example, by truncating the decimal expansion of* $\sqrt{2}$*, show that* $\sqrt{2}$ *is between 1and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	• Rational number • Irrational number • Decimal expansion
Expressions & Equations	Work with radicals and integer exponents.	• Know and apply the properties of **integer exponents** to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$. • 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**. • 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. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger*. • 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.	• Integer • Exponent • Cube root • Square root • Radical • Irrational • Power of ten • Scientific notation

For further explanation and details visit the "Mathematics Revised Academic Content Standards (2010) and Model Curriculum Development" on the ODE website.

	Cluster	I Can…	Key Vocabulary
Expressions & Equations	Understand the connections between proportional relationships, lines, and linear equations.	• Graph **proportional relationships**, interpreting the **unit rate** as the **slope** of the graph. • Compare two different **proportional relationships** represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* • 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.	• Proportional relationship • Unit rate • Slope • Origin • Similar triangles • Y-intercept • Derive
	Analyze and solve linear equations and pairs of simultaneous linear equations.	• Solve **linear equations** in one variable. a. 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). b. Solve **linear equations** with **rational number coefficients**, including equations whose solutions require expanding expressions using the distributive property and collecting **like terms**. • Analyze and solve pairs of simultaneous **linear equations.** a. 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. b. Solve **systems of two linear equations** in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two **linear equations** in two **variables**. *For 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.*	• Linear equation • Equivalent equations • Rational number • Coefficient • Like terms • Solution • System of linear equations • Points of intersection • Infinitely many solutions • Correspond • Variables

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	Cluster	I Can…	Key Vocabulary
Functions	Define, evaluate, and compare 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**. • Compare properties of two **functions** each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *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*. • 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. *For example, the function* $A = s^2$ *giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	• Function • Input • Output • Linear function • Ordered pair • Corresponding • Evaluate
	Use functions to model relationships between quantities.	• 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. • 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.	• Linear function • Rate of exchange • Increasing • Decreasing • Linear • Non-linear • Initial value • Functional relationship • Qualitative • Function • Linear relationship

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	Cluster	I Can…	Key Vocabulary
Geometry	Understand congruence and similarity using physical models, transparencies, or geometry software.	• Verify experimentally the properties of **rotations**, **reflections**, and **translations**: a. Lines are compared to lines, and line segments to line segments of the same length. b. Angles are compared to angles of the same measure. c. **Parallel lines** are compared to **parallel lines**. • 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**. • 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. • Use informal arguments to establish facts about the **angle sum** and **exterior angle** of triangles. • Use informal arguments to establish facts about the angles created when **parallel lines** are cut by a **transversal**. • Use informal arguments to establish facts about the **angle-angle criterion** for **similarity** of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line.*	• Translation • Reflection • Rotation • Parallel line • Congruent • Dilation • Similar • Exterior angle • Transversal • Sequence • Coordinates • Angle sum • Angle-angle criterion
	Understand and apply 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. • Apply the **Pythagorean Theorem** to find the distance between two points in a **coordinate system.**	• Pythagorean Theorem • Converse • Proof • Coordinate system

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	Cluster	I Can…	Key Vocabulary
Geometry	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	• Know the formulas for the **volumes** of **cones**, **cylinders**, and **spheres** and use them to solve-real world and mathematical problems.	• Cylinder • Cone • Sphere • Volume
Statistics & Probability	Investigate patterns of association in bivariate data.	• Construct and interpret **scatter plots** for **bivariate measurement data** (data with two variables) to investigate **patterns of association** between two quantities. • Describe patterns such as **clustering**, **outliers**, **positive or negative association**, **linear association**, and **nonlinear association**. • Know that straight lines are widely used to model relationships between two quantitative variables. • Informally fit a straight line for **scatter plots** that suggest a **linear association**, and informally assess the model fit by judging the closeness of the data points to the line. • Use the equation of a **linear model** to solve problems in the context of **bivariate measurement data**, interpreting the **slope** and **intercept**. *For 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.* • Understand that **patterns of association** can also be seen in **bivariate categorical data** by displaying **frequencies** and **relative frequencies** in a **two-way table** (a table that displays data in two different categories). • 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. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	• Scatter plot • Bivariate data • Clustering • Outliers • Positive association • Negative association • Linear association • Nonlinear association • Trend line • Line of best fit • Linear model • Slope • Intercept • Categorical data • Two-way table • Frequency • Relative frequency • Patterns of association

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