Content Area:	MATHEMATICS	Grade Level:	8
Domain:	The Number System		
Cluster:	Know that there are numbers that are not rational, and approximate them by rational numbers.		

Common Core State Standards in Mathematics (CCSSM)

8.NS.1 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.

8.NS.2 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). *For example, by truncating the decimal expansion of* $\sqrt{2}$, *show that* $\sqrt{2}$ *is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

Understandings: Students will understand…	Essential Questions
• all numbers, rational and irrational, have a location on a number line. • every number has a decimal expansion. • every rational number has a decimal expansion that terminates or eventually repeats. • a number in the form a/b means a is divided by b. • every irrational square root can be estimated by its location between two rational square roots, e.g., $\sqrt{7}$ is between $\sqrt{4}$ and $\sqrt{9}$.	• Why does one need to distinguish between rational and irrational numbers? • How does one locate irrational numbers on a number line?

Knowledge: Students will know…	Skills: Students will be able to…
• numbers that are not rational are called irrational. • the process of dividing one number by another. • how to truncate or round a decimal expansion to a specific number of places. • how to compare decimal values. • the perfect square numbers (if not memorized, students should know how to find the perfect square numbers by multiplying each whole number by itself).	• show that the decimal expansion of a rational number terminates or repeats eventually. • convert a decimal expansion which repeats eventually into a rational number. • find rational approximations of irrational numbers. • compare the size of approximations of irrational numbers. • locate approximations of irrational numbers on a number line. • estimate the value of expressions of irrational numbers.

RESOURCES

- Looking for Pythagoras Investigation 4

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	Expressions and Equations		
Cluster:	Work with radicals and integer exponents.		

Common Core State Standards in Mathematics (CCSSM)

8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

8.EE.2 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.

8.EE.3 Use numbers expressed in the form of a single digit times a whole-number 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 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.*

8.EE.4 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.

Understandings: Students will understand...	Essential Questions
• a number raised to a power *m* means that number is multiplied by itself *m* times. • numbers can be written in many equivalent forms. • perfect square numbers are the whole numbers each raised to the second power. • perfect cube numbers are the whole numbers each raised to the third power. • very large or very small quantities can be estimated using numbers expressed in scientific notation. • how many times as much one number is than another is determined by the relationship between both the single digit parts and their respective powers of ten. For example, 12×10^5 compared to 3×10^3 requires comparing 12 to 3 (4 times larger) and 10^5 to 10^3 (100 times larger), so 12×10^5 is 400 times bigger than 3×10^3. • operations can be performed with numbers expressed in scientific notation. • to find a measurement, the appropriate unit should be used.	• Why does one need to express a number in a form with integer exponents? • Why does one need to write numbers in scientific notation? • What is the advantage of performing operations on numbers expressed in scientific notation rather than numbers in standard form?

Knowledge: Students will know...	Skills: Students will be able to...
• the properties of integer exponents. • $\sqrt{2}$ is irrational. • the perfect squares are 1, 4, 9, 16, ... • the square root of every non-perfect square number is irrational. • the perfect cubes are 1, 8, 27, 64, ... • the cube root of every non-perfect cube number is irrational. • scientific notation is when a number is expressed as a decimal number between 1 and 10 multiplied by a power of 10. • the appropriate units of measurement used for very large quantities and very small quantities. • the rule followed by a piece of technology when it converts a number into scientific notation.	• apply properties of integer exponents to generate equivalent numerical expressions. • 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. • use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities. • express how many times as much one number in scientific notation is than another. • perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. • choose units of appropriate size for measurements of very large or very small quantities. • interpret scientific notation that has been generated by technology.

RESOURCES
• Looking for Pythagoras Investigations 2, 3, and 4; Growing, Growing, Growing Investigation 5

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	**Expressions and Equations**		
Cluster:	**Understand the connections between proportional relationships, lines, and linear equations.**		

Common Core State Standards in Mathematics (CCSSM)

8.EE.5 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.*

8.EE.6 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.

Understandings: Students will understand…

- since rate is a ratio that compares two quantities of different units, a unit rate is a ratio between two measurements in which the second term is one.
- the relationship between variables can be represented using word descriptions, tables, graphs and equations.
- proportional relationships can be represented by lines and linear equations.
- when slopes are the same, the rise divided by the run is constant.
- when the ratio of rise to run is the same between two right triangles, their corresponding sides must be proportional.
- the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.

Essential Questions

- Why is there a need to represent relationships between variables in more than one way?
- When is a relationship between two variables proportional?
- How does thinking of a unit rate as the slope of a line help to solve problems?

Knowledge: Students will know…

- slopes represent unit rates.
- the ratio of rise to run is the change in y-values divided by the respective change in x-values.
- when comparing the relationship between two variables, how to change from one representation to another (words descriptions, tables, graphs, and equations).
- the corresponding angles in similar triangles have the same measure.
- the corresponding sides in similar triangles are proportional.
- right similar triangles must have the same rise to run ratio.
- equations of the form $y = mx$ pass through the origin. equations of the form $y = mx + b$ intercept the vertical axis at b.

Skills: Students will be able to…

- graph proportional relationships.
- interpret the unit rate as the slope of the graph.
- compare two different proportional relationships represented in different ways, e.g. graph to table; table to equation.
- 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.
- derive the equation $y = mx + b$ for a line intercepting the vertical axis at b.

RESOURCES

- Thinking With Mathematical Models Investigation 2

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	Expressions and Equations		
Cluster:	Analyze and solve linear equations and pairs of simultaneous linear equations.		

Common Core State Standards in Mathematics (CCSSM)

8.EE.7 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.

8.EE.8 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.*

Understandings: Students will understand…	Essential Questions
• the solution to a linear equation is a point or set of points which will make the equation true. • properties of operations with numbers can be applied to variables. • solutions to a system of two linear equations are points that will make both equations true. • solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs. • graphing linear equations will enable one to estimate solutions. • equations need to be examined for similarities and differences to facilitate finding solutions. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*	• How does one interpret the number of solutions to linear equations in one variable? • What applications require solving simultaneous linear equations?

Knowledge: Students will know…	Skills: Students will be able to…
• linear equations in one variable can have one solution, infinitely many solutions, or no solutions. • linear equations in one variable can be transformed into $x = a$ (one solution), $a = a$ (infinitely many solutions), or $a = b$ (no solutions) results (where a and b are different numbers). • the distributive property. • like terms need to be combined. • points of intersection satisfy both equations simultaneously. • equations can be written in different forms. *For example,* $-x - 2y = -(x + 2y)$.	• solve linear equations in one variable. • give examples of linear equations with one solution. • give examples of linear equations with infinitely many solutions. • give examples of linear equations with no solution. • transform a linear equation into an equivalent form, $x = a$, $a = a$, or $a = b$, where a and b are different, in order to show the type of solution. • expand expressions using the distributive property. • solve linear equations with rational number coefficients. • analyze and solve pairs of simultaneous linear equations. • solve systems of two linear equations in two variables algebraically. • estimate solutions by graphing the equations. • solve simple cases of two simultaneous linear equations by inspection. • solve real-world and mathematical problems leading to two linear equations in two variables.

RESOURCES
• Thinking With Mathematical Models Investigation 2; Say it with Symbols Investigations 1, 2, 3, and 4; The Shapes of Algebra Investigations 1, 2, 3, and 4

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	**Functions**		
Cluster:	**Define, evaluate, and compare functions.**		

Common Core State Standards in Mathematics (CCSSM)

8.F.1 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.[1]

8.F.2 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.*

8.F.3 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.*

[1]Function notation is not required in Grade 8.

Understandings: Students will understand…	Essential Questions
• 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. • functions can be represented in 4 different ways: -algebraically -graphically -numerically in tables -by verbal descriptions	• Why does one need to define a function? • When should functions be evaluated and compared? • How does knowing the algebraic properties of a function help to graph that function? • What applications could be represented by variables that are not related by a linear function?

Knowledge: Students will know…	Skills: Students will be able to…
• an ordered pair that satisfies a function is the (x, y) that makes the equation true. • properties of functions when they are represented -algebraically -graphically -numerically in tables -by verbal descriptions • $y = mx + b$ defines a linear function whose graph is a straight line. • when the points on a graph do not fall in a straight line, the function is not linear.	• compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). • 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.

RESOURCES

- Thinking With Mathematical Models Investigations 1, 2, 3, and 5; Growing, Growing, Growing Investigation 3; Frogs, Fleas, and Painted Cubes Investigations 2, 3, and 4; Say it With Symbols Investigations 2 and 4; The Shapes of Algebra Investigation 4

Content Area:	**MATHEMATICS**	**Grade Level:**	**8**
Domain:	**Functions**		
Cluster:	**Use functions to model relationships between quantities.**		

Common Core State Standards in Mathematics (CCSSM)

8.F.4 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.

8.F.5 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.

Understandings: Students will understand…

- linear functions can be used to model some relationships between two quantities.
- the rate of change of a linear function in terms of the situation it models, its graph, or a table of values.
- the initial value of a linear function in terms of the situation it models, its graph, or a table of values.
- there are many different functional relationships that are not linear.

Essential Questions

- Why would one use functions to model relationships between quantities?
- What are the distinguishing characteristics of a graph of a function?

Knowledge: Students will know…

- the rate of change is
  -the coefficient of x in a linear function $y = mx+b$.
  -the ratio of the rise to the run between two points on a graph.
  -the constant rate of change between values of the dependent variable for consecutive values in the independent variable.
  -a per unit amount in verbal descriptions.
- the initial value is
  -the constant in an equation of a linear function $y = mx+b$.
  -the point where the line intercepts y-axis.
  -the value that is paired with the zero in the independent column.
  -the starting point in a verbal description.
- a function is called increasing when it goes up from left to right…decreasing when it goes down from left to right.

Skills: Students will be able to…

- construct a function to model a linear relationship between two quantities.
- determine the rate of change of the function from a description of a relationship.
- determine the initial value of the function from a description of a relationship.
- determine the rate of change of the function from two (x, y) values, including reading these from a table or from a graph.
- determine the initial value of the function from two (x, y) values, including reading these from a table or from a graph.
- interpret the rate of change of a linear function in terms of the situation it models.
- interpret the initial value of a linear function in terms of the situation it models.
- interpret the rate of change of a linear function in terms of its graph or a table of values.
- interpret the initial value of a linear function 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.

RESOURCES

- Thinking With Mathematical Models Investigations 1, 2, and 3; Growing, Growing, Growing Investigations 1, 2, 3, and 4; Frogs, Fleas, and Painted Cubes Investigations 1, 2, 3, and 4; Say It With Symbols Investigation 4; The Shapes of Algebra Investigation 4

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	**Geometry**		
Cluster:	**Understand congruence and similarity using physical models, transparencies, or geometry software.**		

Common Core State Standards in Mathematics (CCSSM)

8.G.1. Verify experimentally the properties of rotations, reflections, and translations:

a. Lines are taken to lines, and line segments to line segments of the same length.
b. Angles are taken to angles of the same measure.
c. Parallel lines are taken to parallel lines.

8.G.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.

8.G.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.4. 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.

8.G.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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

Understandings: Students will understand…	Essential Questions
• rotations, reflections, and translations take: -lines to lines -line segments to line segments of the same length -angles to angles of the same measure -parallel lines to parallel lines • 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. • 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. • there are relationships between the interior and exterior angles of a triangle. • there are relationships among the angles formed when parallel lines are cut by a transversal. • when two angles of one triangle are congruent to two angles of another triangle, the third angles are also congruent. • on its own, congruence of corresponding angles determines similarity only for triangles.	• Why does one need to perform transformations on figures? • How does knowing two figures are congruent or similar help one to solve problems?

Knowledge: Students will know…	Skills: Students will be able to…
• congruent figures have the same shape and the same size. • similar figures have the same shape and not necessarily the same size. • that a dilation is a figure which is enlarged or reduced using a scale factor, without altering the center. • that a translation of a figure slides an object a fixed distance in a given direction. • that a rotation is a transformation that turns a figure a given number of degrees around a fixed point. • that a reflection is a transformation in which the figure is the mirror image of the original. • transformations can be described using coordinates. • the sum of the interior angles in a triangle is 180°. • when two angles of one triangle are congruent to two angles of a second triangle, the triangles are similar.	• verify experimentally the properties of: -rotations -reflections -translations • describe a sequence that exhibits the congruence between two congruent figures. • describe the effect of the following on two-dimensional figures using coordinates: -dilations -translations -rotations -reflections • describe a sequence that exhibits the similarity between two similar two-dimensional figures. • 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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

RESOURCES
• Kaleidoscopes, Hubcaps, and Mirrors Investigations 1, 2, 3, 4, and 5

Content Area:	MATHEMATICS	Grade Level:	8
Domain:	Geometry		
Cluster:	Understand and apply the Pythagorean Theorem.		

Common Core State Standards in Mathematics (CCSSM)

8.G.6. Explain a proof of the Pythagorean Theorem and its converse.

8.G.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two- and three- dimensions.

8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Understandings: Students will understand…	Essential Questions
• application of the Pythagorean Theorem. • application of the converse of the Pythagorean Theorem. • why the Pythagorean Theorem can be used to find the distance between two points.	• How can one use the Pythagorean Theorem to solve real-world and mathematical problems?

Knowledge: Students will know…	Skills: Students will be able to…
• the Pythagorean Theorem: -if a and b are the legs, and c is the hypotenuse of the triangle then $a^2 + b^2 = c^2$. • when two sides of a triangle are known, the third side can be found using the Pythagorean Theorem. • the converse of the Pythagorean Theorem: -If $a^2 + b^2 = c^2$, where a, b, and c are the sides of the triangle, then the triangle is a right triangle. • the distance between two points can be found using 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.

RESOURCES

- Looking For Pythagoras Investigations 2, 3, and 4

<table>
<tr><td>Content Area:</td><td>MATHEMATICS</td><td>Grade Level:</td><td>8</td></tr>
<tr><td>Domain:</td><td colspan="3">Geometry</td></tr>
<tr><td>Cluster:</td><td colspan="3">Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</td></tr>
<tr><td colspan="4">Common Core State Standards in Mathematics
(CCSSM)</td></tr>
<tr><td colspan="4">8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.</td></tr>
<tr><td colspan="2">Understandings: Students will understand…</td><td colspan="2">Essential Questions</td></tr>
<tr><td colspan="2">• volume is a unit of measurement that indicates the number of cubic units a three-dimensional shape can hold.</td><td colspan="2">• How can one use volume to solve real-world and mathematical problems?
• What is the relationship, if any, between volume of cones, cylinders, and spheres?</td></tr>
<tr><td colspan="2">Knowledge: Students will know…</td><td colspan="2">Skills: Students will be able to…</td></tr>
<tr><td colspan="2">• volume is measured in cubic units.
• know the formulas for the volumes of:
-cones
-cylinders
-spheres</td><td colspan="2">• state formulas of:
-cones
-cylinders
-spheres.
• use formulas of cones, cylinders, and spheres to solve real-world and mathematical problems.</td></tr>
<tr><td colspan="4">RESOURCES</td></tr>
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Content Area:	MATHEMATICS	Grade Level:	8
Domain:	**Statistics and Probability**		
Cluster:	**Investigate patterns of association in bivariate data.**		

Common Core State Standards in Mathematics (CCSSM)

8.SP.1. 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.

8.SP.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 by judging the closeness of the data points to the line.

8.SP.3. 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.*

8.SP.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. 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?*

Understandings: Students will understand…	Essential Questions
• lines used to model the association between two quantities will provide more information than just the data points themselves. • the model line gets more accurate as more data points are located on the line. • once the equation of a linear model is found, it can be used to solve problems in the context of bivariate measurement data. • the slope and intercept of the linear model can be interpreted in the context of the problem. • scatterplots show whether or not there is an association between two quantities. • patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table.	• Why is it important to describe patterns of an association between two quantities? • When is a scatterplot used to determine if there is an association between two quantities? • When is a two-way table used to determine if there is an association between two variables?

Knowledge: Students will know…	Skills: Students will be able to…
• clustering is when members of a data set surround a particular number. • an outlier is an element of a data set that distinctly stands out from the rest of the data. • positive association is when the slope of the model line is positive. • negative association is when the slope of the model line is negative. • the association is linear when a line will model the data. • the association is nonlinear when a line will not model the data. • straight lines are widely used to model relationships between two quantitative variables. • a two-way table summarizes data about two categorical variables collected from the same subjects. • relative frequencies for rows or columns in a two-way table can be used to describe possible associations between the two variables.	• construct scatter plots for bivariate measurement data to investigate patterns of association between two quantities. • interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. • describe patterns such as: -clustering -outliers -positive association -negative association -linear association -nonlinear association • informally fit a straight line for scatter plots that suggest a linear association. • informally assess the model fit by judging the closeness of the data points to the line for scatterplots that suggest a linear association. • 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.* • construct a two-way table summarizing data on two categorical variables collected from the same subjects. • 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?*

RESOURCES
• Thinking With Mathematical Models Investigations 2 and 3; The Shapes of Algebra Investigations 2 and 3; Samples and Populations Investigation 4; CC Investigation 5