8th Grade Mathematics
Units of Instruction
2022-2023

8th Grade Mathematics

UNITS 1 Transformations, congruence and Similarity	Unit 2: Properties of exponents and scientific notation	UNIT 3: Exponents, roots and the Pythagorean Theorem	UNIT 4: Similarity, slope, and lines	UNIT 5: Linear and Nonlinear Functions	UNIT 6: Using linear functions to model and compare relationships (scatterplots and systems)
8.G.2 **8.G.3** **8.G.5** 8.G.1 8.G.4 **4 weeks**	**8.EE.1** **8.NS.2** 8.EE.4 8.EE.3 **4 weeks**	**8.G.7** ***8.EE.7*** **8.NS.2** 8.EE.2 8.NS.1 8.G.6 8.G.8 8.G.9 **6 weeks**	**8.EE.6** **8.EE.7** 8.EE.5 **5 weeks**	**8.F.2** **8.F.4** ***8.EE.7*** 8.F.1 8.F.3 8.F.5 **9 weeks**	**8.EE.8** **8.SP.1** **8.EE.7** 8.SP.2 8.SP.3 **8 weeks**
***Fluency Standards (taught all year long): 8.EE.7**					

Priority Standards: 8.EE.1, 8.EE.6, 8.EE.7, 8.EE.8, 8.F.2, 8.F.4, 8.G.2, 8.G.3, 8.G.5, 8.G.7, 8.NS.2, 8.SP.1

8th Grade Mathematics

Unit 1: Transformations, Congruence and Similarity

Grade 8 Mathematics
Unit 1: Transformations, Congruence and Similarity

In this unit, students extend their understanding of scale drawings and the coordinate plane to define transformations. They investigate and formalize transformations that lead to congruence and others that lead to similar figures. They generalize patterns in how coordinates are impacted by transformations.

Duration: 20 Days

Standards for Mathematical Practice	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Priority Standards	
Standards	**Clarifications**
Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software. **KY.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.**	Students understand a figure, called a pre-image, is congruent to another figure, called the image, if the second figure can be obtained by a sequence of congruence transformations performed on the first figure. Students describe the sequence of congruence transformations necessary to transform one figure to a congruent second figure. **KY.HS.G.4** **Coherence KY.8.G.2→ KY.HS.G.5**

MP.2, MP.7	
Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software. **KY.8.G.3 Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.** MP.3, MP.5, MP.6	Emphasis is on noticing patterns across examples, noting how the x and y values change for different kinds of transformations. **Coherence KY.8.G.3→ KY.HS.G.9**
Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software. **KY.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.** MP.3	Students use technology or physical tools to explore triangles. They 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 of why this is so. **KY.HS.G.7** **Coherence KY.7.G.5→ KY.8.G.5→ KY.HS.G.10**
Supporting Standards	
Standards	**Clarifications**
Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software. **KY.8.G.1 Verify experimentally the properties of**	Emphasis is congruence transformations preserve corresponding congruent lines, segments and angles. **KY.HS.G.2 Coherence KY.8.G.1→ KY.HS.G.3(+)**

rotations, reflections and translations: **● Lines are congruent to lines.** **● Line segments are congruent to line segments of the same length.** **● Angles are congruent to angles of the same measure.** **● Parallel lines are congruent to parallel lines.** MP.5, MP.6	
Cluster: Understand congruence and similarity using physical models, transparencies, or geometry software. **KY.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.** MP.2, MP.5, MP.7	If similar, non-congruent figures are given, students understand a dilation must have taken place in the sequence of transformations to obtain the image from the pre-image. **KY.HS.G.2** **Coherence KY.8.G.4→ KY.HS.G.10**

8th Grade Mathematics

Unit 2: Properties of Exponents and Scientific Notation

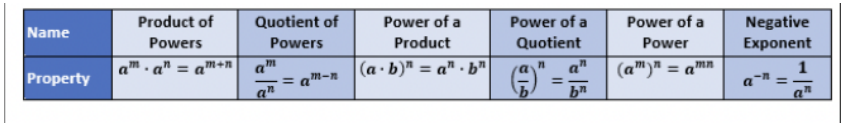
8th Grade Mathematics
Unit 2: Properties of Exponents and Scientific Notation

In this unit, students extend their understanding of nonlinear relationships to explore expressions and equations with exponents other than one and with scientific notation. They apply their understanding of the notation to evaluate and operate with expressions in scientific notation.

Duration: 20 Days

<table>
<tr><th colspan="2">Standards for Mathematical Practice</th></tr>
<tr><td>MP.1. Make sense of problems and persevere in solving them.
MP.2. Reason abstractly and quantitatively.
MP.3. Construct viable arguments and critique the reasoning of others.
MP.4. Model with mathematics.</td><td>MP.5. Use appropriate tools strategically.
MP.6. Attend to precision.
MP.7. Look for and make use of structure.
MP.8. Look for and express regularity in repeated reasoning.</td></tr>
<tr><th colspan="2">Priority Standards</th></tr>
<tr><th>Standards</th><th>Clarifications</th></tr>
<tr><td>Cluster: Work with radicals and integer exponents.

KY.8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.

MP.3, MP.7, MP.8</td><td> 
<table>
<tr><th>Name</th><th>Product of Powers</th><th>Quotient of Powers</th><th>Power of a Product</th><th>Power of a Quotient</th><th>Power of a Power</th><th>Negative Exponent</th></tr>
<tr><th>Property</th><td>$a^m \cdot a^n = a^{m+n}$</td><td>$\frac{a^m}{a^n} = a^{m-n}$</td><td>$(a \cdot b)^n = a^n \cdot b^n$</td><td>$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$</td><td>$(a^m)^n = a^{mn}$</td><td>$a^{-n} = \frac{1}{a^n}$</td></tr>
</table>
Coherence KY.8.EE.1→ KY.HS.N.1</td></tr>
<tr><td>Cluster: Know that there are numbers that are</td><td>For example, by shortening the decimal expansion of √2 by dropping all decimals past a certain point and</td></tr>
</table>

not rational and approximate them by rational numbers. **KY.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.** MP.2, MP.7, MP.8	showing √2 is between 1 and 2, then between 1.4 and 1.5 and so on. Students recognize this process could be repeated an infinite number of times. **Coherence KY.8.NS.2→ KY.HS.N.3**
Supporting Standards	
Standards	**Clarifications**
Cluster: Work with radicals and integer exponents. **KY.8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 (Scientific Notation) to estimate very large or very small quantities and express how many times larger or smaller one is than the other.** MP.3, MP.5, MP.6	Students conceptualize why a number could be written in scientific notation and the benefits of doing so and connect exponent rules learned earlier to the methods of writing a quantity in scientific notation. **Coherence KY.8.EE.3→ KY.HS.N.6**
Cluster: Work with radicals and integer exponents. **KY.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 appropriate units for real-life situations. When solving problems and using technology, it is possible solutions are given that take the form of 1.2 xx 10^00 or 3.4 x 10^−07. Some technologies also use a capital E when denoting numbers such a 1.45E 07 or 4.665 E-11. **Coherence KY.8.EE.4→ KY.HS.N.4**

choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology. MP.2, MP.5, MP.6	

8th Grade Mathematics

Unit 3: Exponents, Roots, and the Pythagorean Theorem

8th Grade Mathematics
Unit 3: Exponents, Roots, and the Pythagorean Theorem

In this unit, students apply their understanding of similar triangles to right triangles in order to make sense of and use the Pythagorean Theorem. The geometric properties and representations provide a context for working with exponents, roots, and irrational numbers and also provide a context for problem solving with these skills.

Duration: 30 Days

Standards for Mathematical Practice	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Priority Standards	
Standards	**Clarifications**
Cluster: Understand and apply the Pythagorean Theorem. **KY.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.** MP.1, MP.2, MP.4	Students apply the Pythagorean Theorem to mathematical real-world problems. For example, finding the width of a television given the length and diagonal distance (two-dimensional) and the distance from the top left rear corner of a prism to the bottom right front corner of the prism (three-dimensional). **Coherence KY.8.G.7→KY.HS.G.12**

Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations. **KY.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 combining like terms.** MP.2, MP.3, MP.7	Building upon skills from grade 7, students combine like terms on the same side of the equality and use the distributive property to simplify the equation when solving. Emphasis in this standard is also on using rational number coefficients. Solutions of certain equations may elicit infinitely many or no solutions. **Coherence KY.7.EE.1→ KY.8.EE.7→ KY.HS.A.18**
Cluster: Know that there are numbers that are not rational and approximate them by rational numbers. **KY.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.** MP.2, MP.7, MP.8	For example, by shortening the decimal expansion of √2 by dropping all decimals past a certain point and showing √2 is between 1 and 2, then between 1.4 and 1.5 and so on. Students recognize this process could be repeated an infinite number of times. **Coherence KY.8.NS.2→ KY.HS.N.3**
Supporting Standards	

Standards	Clarifications
Cluster: Work with radicals and integer exponents. **KY.8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that perfect squares and perfect cubes are rational.** MP.5, MP.6	Students do not prove these are the only solutions, but rather use informal methods, such as guess and check. For example, $\sqrt{64} = \sqrt{8^2} = 8$ and $\sqrt[3]{5^3} = 5$. Since $\sqrt{p}$ is defined to mean the positive solution to the equation $x^2 = p$ (when it exists), it is not correct to say (as is common) $\sqrt{64} = \pm 8$. In describing the solutions to $x^2 = 64$, students write $x = \pm\sqrt{64} = \pm 8$. **Coherence KY.8.EE.2→ KY.HS.A.12**
Cluster: Know that there are numbers that are not rational and approximate them by rational numbers. **KY.8.NS.1 Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.** MP.2, MP.6, MP.7	Emphasis is placed on how all rational numbers can be written as an equivalent decimal. The end behavior of the decimal determines the classification of the number. **Coherence KY.7.NS.2→ KY.8.NS.1→ KY.HS.N.3**
Cluster: Understand and apply the Pythagorean Theorem. **KY.8.G.6 Explain a proof of the Pythagorean Theorem and its converse.** MP.3, MP.7	Students verify, using a model, the sum of the squares of the legs is equal to the square of the hypotenuse in a right triangle. Students understand if the sum of the squares of the two smaller legs is equal to the square of the third leg, then the triangle is a right triangle. **Coherence KY.7.G.6→ KY.8.G.6→KY.HS.G.11**
Cluster: Understand and apply the Pythagorean	Students calculate distances on the coordinate plane

Theorem. **KY.8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.** MP.5, MP.6	between two non-vertical or non-horizontal points by applying the Pythagorean Theorem. Students calculate distances between two non-vertical or non-horizontal points not given on a coordinate plane by applying the Pythagorean Theorem to absolute horizontal and vertical distances the student calculates. **KY.HS.G.19** **Coherence KY.8.G.8→ KY.HS.G.21**
Cluster: Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. **KY.8.G.9 Apply the formulas for the volumes and surface areas of cones, cylinders and spheres and use them to solve real-world and mathematical problems.** MP.1, MP.7, MP.8	Cones: $V = \frac{1}{3}\pi r^2 h \quad SA = \pi r\,(r + \sqrt{(r^2 + h^2)})$ Cylinders: $V = \pi r^2 h \quad SA = 2\pi r h + 2\pi r^2$ Spheres: $V = \frac{4}{3}\pi r^3 \quad SA = 4\pi r^2$ **KY.HS.G.29** **Coherence KY.7.G.4→ KY.8.G.9→ KY.HS.G.25**

8th Grade Mathematics

Unit 4: Similarity, Slopes, and Lines

8th Grade Mathematics
Unit 4: Similarity, Slopes, and Lines

This unit extends the students' understanding of transformations and similarly from the last unit to deepen their understanding of graphing proportional and linear equations. They graph proportional relationships, noting that the constant of proportionality is the slope of the line. They translate these lines to create other lines with starting values other than 0. They use similar triangles to show that the slope, m, is a constant between any two points on the line. The students use this conceptual understanding to build procedural fluency in graphing and interpreting lines and in later units, will use it to solve problems involving linear relationships.

Duration: 25 Days

Standards for Mathematical Practice	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Priority Standards	
Standards	**Clarifications**
Cluster: Understand the connections between proportional relationships, lines and linear equations. **KY.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**	Using the properties of similar triangles, demonstrate the slope between any two pairs of points on a non-vertical line create the same rise-run ratio when simplified. Understand $y = mx$ and $y = mx + b$ differ in that $y = mx$ only has the possibility of 0 being the y-intercept and that $y = mx + b$ has infinite possibilities, including 0, for the y- intercept depending on the value of b.

plane; know 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. MP.3, MP.4, MP.7	**KY.HS.G.22** **Coherence KY.7.RP.2→ KY.8.EE.6→ KY.HS.A.23**
Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations. **KY.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 combining like terms.** MP.2, MP.3, MP.7	Building upon skills from grade 7, students combine like terms on the same side of the equality and use the distributive property to simplify the equation when solving. Emphasis in this standard is also on using rational number coefficients. Solutions of certain equations may elicit infinitely many or no solutions. **Coherence KY.7.EE.1→ KY.8.EE.7→ KY.HS.A.18**

Supporting Standards	
Standards	**Clarifications**
Cluster: Understand the connections between proportional relationships, lines and linear equations.	Emphasis is on relating previous knowledge of unit rate to slope in tables, graphs, equations and sets of ordered pairs and comparing the slopes of two different proportional relationships. Different ways the

KY.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. MP.2, MP.3, MP.4	proportional relationships can be represented include tables, graphs, equations, or sets of ordered pairs. **KY.8.F.2** **Coherence KY.7.RP.2→ KY.8.EE.5→ KY.HS.A.23**

8th Grade Mathematics

Unit 5: Linear and Nonlinear Functions

8th Grade Mathematics
Unit 5: Linear and Nonlinear Functions

In this unit, students develop an understanding of functions and function families. They distinguish functions from the equations that model them and use many representations of functions to solve problems. The students extend their understanding of proportional relationships to define linear functions and distinguish them from nonlinear functions. They use equations, description, tables, and graphs as models to describe and compare linear relationships. They understand properties of linear functions and can translate between representations in order to solve equations in one variable.

Duration: 45 Days

<table>
<tr><th colspan="2">Standards for Mathematical Practice</th></tr>
<tr><td>MP.1. Make sense of problems and persevere in solving them.
MP.2. Reason abstractly and quantitatively.
MP.3. Construct viable arguments and critique the reasoning of others.
MP.4. Model with mathematics.</td><td>MP.5. Use appropriate tools strategically.
MP.6. Attend to precision.
MP.7. Look for and make use of structure.
MP.8. Look for and express regularity in repeated reasoning.</td></tr>
<tr><th colspan="2">Priority Standards</th></tr>
<tr><th>Standards</th><th>Clarifications</th></tr>
<tr><td>Cluster: Define, evaluate and compare functions.

KY.8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

MP.1, MP.2, MP.4</td><td>Given a linear function represented using one method listed and another linear function represented by different method listed, determine which function has the greater or lesser rate of change or greater or lesser initial value

Coherence KY.7.RP.2→ KY.8.F.2→ KY.HS.F.1</td></tr>
</table>

Cluster: Use functions to model relationships between quantities. **KY.8.F.4 Construct a function to model a linear relationship between two quantities.** **a. 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.** **b. 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.** MP.4, MP.5, MP.8	Examining a relationship between two quantities yields a function rule. This function rule can be described using its initial value and rate of change, from a variety of representations, including tables, graphs, equations and verbal descriptions. Understand the rate of change and initial value in terms of the situation it models. **KY.HS.F.6** **Coherence KY.7.RP.2→ KY.8.F.4→ KY.HS.F.3**
Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations. **KY.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**	Building upon skills from grade 7, students combine like terms on the same side of the equality and use the distributive property to simplify the equation when solving. Emphasis in this standard is also on using rational number coefficients. Solutions of certain equations may elicit infinitely many or no solutions. **Coherence KY.7.EE.1→ KY.8.EE.7→ KY.HS.A.18**

distributive property and combining like terms. MP.2, MP.3, MP.7	
Supporting Standards	
Standards	**Clarifications**
Cluster: Define, evaluate and compare functions. **KY.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.** MP.7, MP.8	Students understand the reasoning that not all relations are functions. Note: Function notation is not required in grade 8. **Coherence KY.8.F.1→ KY.HS.F.1**
Cluster: Define, evaluate and compare functions. **KY.8.F.3 Understand properties of linear functions.** **a. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line.** **b. Identify and give examples of functions that are not linear.** MP.7	a. For example, the equation c = 3g + 5 models the linear function for the total cost, c, of bowling, where g represents the number of games played and shoe rental is $5. b. 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. **Coherence KY.7.EE.4→ KY.8.F.3→ KY.HS.F.11**

Cluster: Use functions to model relationships between quantities. **KY.8.F.5 Use graphs to represent functions.** **a. Describe qualitatively the functional relationship between two quantities by analyzing a graph.** **b. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.** MP.3, MP.7	Students describe whether a function is increasing or decreasing and linear or nonlinear. Function examples are described in contexts as well as in symbols. **Coherence KY.7.RP.2→ KY.8.F.5→ KY.HS.F.4**

8th Grade Mathematics

Unit 6: Using Linear Functions to Model and Compare Relationships (scatterplots and systems)

8th Grade Mathematics

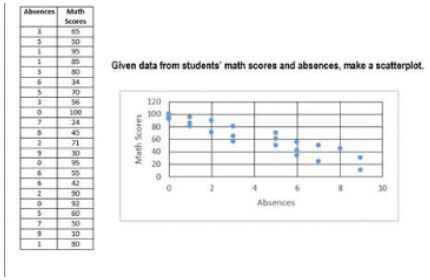
Unit 6: Using Linear Functions to Model and Compare Relationships (scatterplots and systems)

This unit builds on students' understanding of statistical processes. The students create and interpret scatterplots as a model of two-variable relationships. With the tools for analyzing linear functions from Unit 3, they create lines and linear functions to model relationships in scatterplots when appropriate. They write, interpret and solve systems of two simultaneous linear functions to solve problems.

Duration: 40 days

Standards for Mathematical Practice	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
Priority Standards	
Standards	**Clarifications**
Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations. **KY.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**	Building upon skills from grade 7, students combine like terms on the same side of the equality and use the distributive property to simplify the equation when solving. Emphasis in this standard is also on using rational number coefficients. Solutions of certain equations may elicit infinitely many or no solutions.

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 combining like terms.** MP.2, MP.3, MP.7	**Coherence KY.7.EE.1→ KY.8.EE.7→ KY.HS.A.18**
Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations. **KY.8.EE.8 Analyze and solve a system of two 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; understand that a system of two linear equations may have one solution, no solution, or infinitely many solutions.** **b. Solve systems of two linear equations in two variables algebraically by using substitution where at least one equation contains at least one variable whose coefficient is 1 and by inspection for simple cases** **c. Solve real-world and mathematical problems leading to two linear equations in two variables.**	a. Examples are both mathematical and real-life contexts. Emphasis is on determining what types of contexts lead to having no solutions or infinitely many solutions. Students use tables, graphs and equations to explain why a graphed system has infinitely many or no solutions. b. Elimination and/or matrices are not required for grade 8. Emphasis is on choosing a method. Students 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 and select from the other approaches, based on the numbers in the problem. Solving systems algebraically will be with a coefficient of 1; for example, $y = 3x$, $y=-12x+ 6$, $x= 2$, $x=2y+1$. **Coherence KY.7.EE.2→ KY.8.EE.8→ KY.HS.A.20**

MP.1, MP.3, MP.4	
Cluster: Investigate patterns of association in bivariate data. **KY.8.SP.1 Construct and interpret scatter plots for bivariate numerical data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.** MP.2, MP.7	For example, given the data and scatter plot to the left, students explain the relationship between students' absences and math scores shows a negative, linear association and has no obvious outliers.  **KY.HS.SP.6** **Coherence KY.8.SP.1→ KY.HS.SP.8**

Supporting Standards

Standards	Clarifications
Cluster: Investigate patterns of association in bivariate data. **KY.8.SP.2 Know that lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a line and informally assess the model fit by judging the closeness of the data points to the line.** MP.2	Students are informally fitting a line to data; they judge whether or not a given line is a good fit for the data and describe needed adjustments. Students recognize some scatter plots cannot be described by a line. **KY.HS.SP.6** **Coherence KY.8.SP.2→ KY.HS.SP.8**

Cluster: Investigate patterns of association in bivariate data. **KY.8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate numerical data, interpreting the slope and intercept.** MP.2, MP.4	For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height and an initial value of 4 cm means the plant was 4 cm tall when measuring began. **KY.HS.SP.6** **Coherence KY.8.SP.3→ KY.HS.SP.7**