Common Core Georgia Performance Standards
8th Grade - At a Glance

<table>
<tr><th colspan="9">Common Core Georgia Performance Standards: Curriculum Map</th></tr>
<tr><th colspan="5">Semester 1</th><th colspan="4">Semester 2</th></tr>
<tr><th>Unit 1</th><th>Unit 2</th><th>Unit 3</th><th>Unit 4</th><th>Unit 5</th><th>Unit 6</th><th>Unit 7</th><th>Unit 8</th><th>Unit 9</th></tr>
<tr><th>3 weeks</th><th>5 weeks</th><th>4 weeks</th><th>1 week</th><th>4 weeks</th><th>5 weeks</th><th>4 weeks</th><th>3 weeks</th><th>5 weeks</th></tr>
<tr><th>Transformations, Congruence and Similarity</th><th>Exponents</th><th>Geometric Applications of Exponents</th><th>Functions</th><th>Linear Functions</th><th>Linear Models and Tables</th><th>Solving Systems of Equations</th><th>Review</th><th>Show What We Know</th></tr>
<tr>
<td>MCC8.G.1
MCC8.G.2
MCC8.G.3
MCC8.G.4
MCC8.G.5

Transition Standard (2012-2013 only)
MCC7.G.5</td>
<td>MCC8.EE.1
MCC8.EE.2 (evaluating)
MCC8.EE.3
MCC8.EE.4
MCC8.EE.7a
MCC8.EE.7b
MCC8.NS.1
MCC8.NS.2

Transition Standard (2012-2013 only)
MCC7.EE.4b</td>
<td>MCC8.G.6
MCC8.G.7
MCC8.G.8
MCC8.G.9
MCC8.EE.2 (equations)</td>
<td>MCC8.F.1
MCC8.F.2</td>
<td>MCC8.EE.5
MCC8.EE.6
MCC8.F.3</td>
<td>MCC8.F.4
MCC8.F.5
MCC8.SP.1
MCC8.SP.2
MCC8.SP.3
MCC8.SP.4</td>
<td>MCC8.EE.8a
MCC8.EE.8b
MCC8.EE.8c</td>
<td>ALL</td>
<td>ALL PLUS
High School Prep Review
• inequalities
• exponent rules word problems
• expressions
• exponential graphs
• graphing calculators

Transition Standards (2012-2013 only)
MCC7.SP.7a
MCC7.SP.7b
MCC7.SP.8a
MCC7.SP.8b
MCC7.SP.8c</td>
</tr>
<tr><td colspan="9">Power Standards are highlighted above and are linked to the Unwrapped Standard.
2 Buffer Days are included after each Unit for Remediation and Enrichment</td></tr>
<tr><th colspan="9">Incorporated Standards</th></tr>
<tr><td></td><td></td><td>MCC8.EE.7</td><td></td><td>MCC8.EE.7</td><td>MCC8.EE.7</td><td>MCC8.EE.7</td><td></td><td></td></tr>
<tr><th colspan="9">Standards for Mathematical Practice</th></tr>
<tr><td colspan="4">1 Make sense of problems and persevere in solving them.
2 Reason abstractly and quantitatively.
3 Construct viable arguments and critique the reasoning of others.
4 Model with mathematics</td><td colspan="5">5 Use appropriate tools strategically.
6 Attend to precision.
7 Look for and make use of structure.
8 Look for and express regularity in repeated reasoning.</td></tr>
</table>

Adapted from GA DOE by

FORSYTH COUNTY SCHOOLS

1st Semester	
Unit 1: Transformations, Congruence and Similarity	
Understand congruence and similarity using physical models, transparencies, or geometry software. **MCC8.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. **MCC8.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.	**MCC8.G.3** Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates. **MCC8.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. **MCC8.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. **Transition Standard (Teach 2012-2013 only):** **MCC7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
Unit 2: Exponents	
Work with radicals and integer exponents. **MCC8.EE.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. **MCC8.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 √2 is irrational. **MCC8.EE.3** 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. **MCC8.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. **Analyze and solve linear equations and pairs of simultaneous linear equations.** **MCC8.EE.7** Solve linear equations in one variable.	**MCC8.EE.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. **Know that there are numbers that are not rational, and approximate them by rational numbers.** **MCC8.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. **MCC8.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). **Transition Standard (Teach 2012-2013 only):** **MCC7.EE.4b** Solve word problems leading to inequalities of the form $px + q > r$ or $+q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

MCC8.EE.7a 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 $x = a, a = a, or\ a = b$, (where a and b are different numbers).	
Unit 3: Geometric Applications of Exponents	
Understand and apply the Pythagorean Theorem. **MCC8.G.6** Explain a proof of the Pythagorean Theorem and its converse. **MCC8.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. **MCC8.G.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.** **MCC8.G.9** Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. **Work with radicals and integer exponents.** **MCC8.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 √2 is irrational.
Unit 4: Functions	
Define, evaluate, and compare functions. **MCC8.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.	**MCC8.F.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
Unit 5: Linear Functions	
Understand the connections between proportional relationships, lines, and linear equations. **MCC8.EE.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. **MCC8.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 $y = mx + b$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	**Define, evaluate, and compare functions.** **MCC8.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.

2nd Semester	
Unit 6: Linear Models and Tables	
Use functions to model relationships between quantities. **MCC8.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. **MCC8.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. **Investigate patterns of association in bivariate data.** **MCC8.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.	**MCC8.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. **MCC8.SP.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. **MCC8.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.
Unit 7: Solving Systems of Equations	
Analyze and solve linear equations and pairs of simultaneous linear equations. **MCC8.EE.8** Analyze and solve pairs of simultaneous linear equations. **MCC8.EE.8a** 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.	**MCC8.EE.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. **MCC8.EE.8c** Solve real-world and mathematical problems leading to two linear equations in two variables.
Unit 8/9: Review/Show What We Know	
ALL STANDARDS **Transition Standard (Teach 2012-2013 only):** **MCC7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **MCC7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events **MCC7.SP.7b** Develop a probability model (which may not be uniform) by observing	**MCC7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **MCC7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. **MCC7.SP.8b** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. **MCC7.SP.8c** Design and use a simulation to generate frequencies for compound events.

CCGPS Unwrapped Standard

Forsyth County Schools

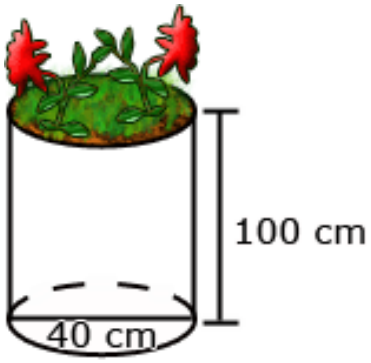
Content Area	Mathematics
Grade/Course	8th Grade
Unit of Study	Unit 3: Geometric Applications of Exponents
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.G.9 Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Know	**Formulas (Volume)**	**1**
Use	**Cones, Cylinders, and Spheres**	**2**
Solve	**Real-world problems**	**2**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Know and use volume formulas for cones, cylinders, and spheres **Solve real-world problems involving cones, cylinders, and spheres.**	**What is volume?** **How are cones, spheres, and cylinders related?** **When would you need to find the volume of a cone, cylinder, or sphere?**

Explanations and Examples
Example: • James wanted to plant pansies in his new planter. He wondered how much potting soil he should buy to fill it. Use the measurements in the diagram below to determine the planter's volume.      cylindrical planter
Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard

Forsyth County Schools

Content Area	Mathematics
Grade/Course	8th Grade
Unit of Study	Unit 2: Exponents
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.
Example: $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Know **Apply** **Generate**	**Properties of integer exponents** **Equivalent numerical expressions**	**1** **2** **2**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Know and apply properties of integer exponents. **Integer exponents are used to generate equivalent numerical expressions when multiplying, dividing, or raising a power to a power.**	**When can we use properties of exponents?** **Why do we use properties of exponents?** **Why does $x^0 = 1$?** **How do I generate equivalent expressions using numerical bases and the laws of exponents?**

Explanations and Examples
Examples: • $\frac{4^3}{5^2} = \frac{64}{25}$ • $\frac{4^3}{4^7} = 4^{3-7} = 4^{-4} = \frac{1}{4^4} = \frac{1}{256}$ • $\frac{4^{-3}}{5^2} = 4^{-3} \times \frac{1}{5^2} = \frac{1}{4^3} \times \frac{1}{5^2} = \frac{1}{64} \times \frac{1}{25} = \frac{1}{16,000}$
Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard

Forsyth County Schools

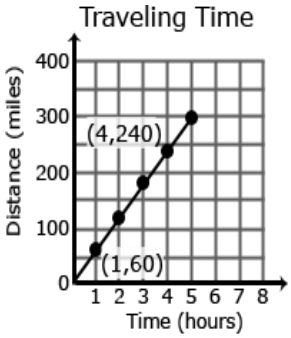
Content Area	Math
Grade/Course	8th Grade
Unit of Study	Unit 5: Linear Functions
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.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.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
graph **interpret** **compare**	**proportional relationships** **unit rate** **slope**	2 2/3 3

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Graph and compare proportional relationships. **Discover that unit rate is the slope of a graph.** **Identify the unit rate (or slope) in graphs, tables, and equations to compare two or more proportional relationships.**	**How are equations and graphs related?** **What does slope mean?**

Explanations and Examples
Using graphs of experiences that are familiar to students increases accessibility and supports understanding and interpretation of proportional relationship. Students are expected to both sketch and interpret graphs. **Example:** • **Compare the scenarios to determine which represents a greater speed. Include a description of each scenario including the unit rates in your explanation.** **Scenario 1:**      **Scenario 2:** ***y* = 50*x*** ***x* is time in hours** ***y* is distance in miles**
Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard Forsyth County Schools

Content Area	Math
Grade/Course	8th Grade
Unit of Study	Unit 2: Exponents
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.EE.7a and 7b

7a. Solve linear equations in one variable. Give examples of linear equations with one solution, infinitely many, or no solution. Transform given equations into simpler forms.

7b. Solve linear equations with rational coefficients, including those solutions that require using distributive property and collecting like terms.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Solve **Transform** **Expanding (forms)** **Collecting (combining)**	**Linear equations** **Solutions (one, infinitely many, or none)** **Variable** **Equations forms** **Rational number coefficient** **Distributive property** **Like terms**	**1** **2**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Solve equations in one variable, including single and multi-step equations. Equations shall include rational numbers, distributive property, and combining like terms. **Identify the number of solutions of an algebraic equation.**	**When solving an algebraic equation, how do I know which operations to use?** **How do I use algebraic equations to solve real-world word problems?** **When solving an algebraic equation, how do I know if an equation has one, many, or no solutions?**

Explanations and Examples
As students transform linear equations in one variable into simpler forms, they discover the equations can have one solution, infinitely many solutions, or no solutions. **When the equation has one solution, the variable has one value that makes the equation true as in 12-4*y*=16. The only value for y that makes this equation true is -1.** **When the equation has infinitely many solutions, the equation is true for all real numbers as in 7*x* + 14 = 7 (*x*+2). As this equation is simplified, the variable terms cancel leaving 14 = 14 or 0 = 0. Since the expressions are equivalent, the value for the two sides of the equation will be the same regardless which real number is used for the substitution.** **When an equation has no solutions it is also called an inconsistent equation. This is the case when the two expressions are not equivalent as in 5*x* - 2 = 5(*x*+1). When simplifying this equation, students will find that the solution appears to be two numbers that are not equal or -2 = 1. In this case, regardless which real number is used for the substitution, the equation is not true and therefore has no solution.** **Examples:** • **Solve for x:** o $-3(x+7)=4$ o $3x-8=4x-8$ o $3(x+1)-5=3x-2$ • **Solve:** o $7(m-3)=7$ o $\frac{1}{4}-\frac{2}{3}y=\frac{3}{4}-\frac{1}{3}y$
Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard

Forsyth County Schools

Content Area	Math
Grade/Course	8th Grade
Unit of Study	Unit 7: Solving Systems of Equations
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.EE.8c Solve real world and mathematical problems leading to two linear equations in two variables.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Solve	**real world problems**	**2**
Graph	**mathematical problems**	**2**
Create	**linear equations**	**3**
Interpret	**two variable**	**2**
Determine		**1**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Solve and graph linear equations of real world problems, such that one may compare and interpret.	**What methods can be used to solve systems?** **How can you represent real-world problems algebraically?** **How can you represent real-world problems graphically?** **How do we interpret the solutions of a system of linear equations?**

Explanations and Examples

Systems of linear equations can also have one solution, infinitely many solutions or no solutions. Students will discover these cases as they graph systems of linear equations and solve them algebraically.

A system of linear equations whose graphs meet at one point (intersecting lines) has only one solution, the ordered pair representing the point of intersection. A system of linear equations whose graphs do not meet (parallel lines) has no solutions and the slopes of these lines are the same. A system of linear equations whose graphs are coincident (the same line) has infinitely many solutions, the set of ordered pairs representing all the points on the line.

By making connections between algebraic and graphical solutions and the context of the system of linear equations, students are able to make sense of their solutions. Students need opportunities to work with equations and context that include whole number and/or decimals/fractions.

Examples:

- **Find x and y using elimination and then using substitution.**

  $3x + 4y = 7$

  $-2x + 8y = 10$

- **Plant A and Plant B are on different watering schedules. This affects their rate of growth. Compare the growth of the two plants to determine when their heights will be the same.**

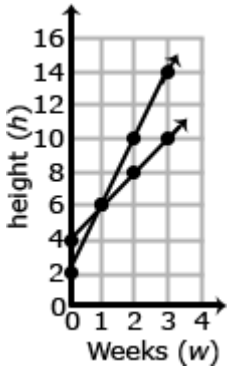
  Let *W* = number of weeks

  Let *H* = height of the plant after *W* weeks

Plant A		
W	**H**	
0	**4**	**(0,4)**
1	**6**	**(1,6)**
2	**8**	**(2,8)**
3	**10**	**(3,10)**

Plant B		
W	**H**	
0	**2**	**(0,2)**
1	**6**	**(1,6)**
2	**10**	**(2,10)**
3	**14**	**(3,14)**

- **Given each set of coordinates, graph their corresponding lines.**
  Solution:



- **Write an equation that represent the growth rate of Plant A and Plant B.**
  Solution:

  Plant A $H = 2W + 4$

  Plant B $H = 4W + 2$

- **At which week will the plants have the same height?**
  Solution:

  The plants have the same height after one week.

  Plant A: $H = 2W + 4$ **Plant B:** $H = 4W + 2$

  Plant A: $H = 2(1) + 4$ **Plant B:** $H = 4(1) + 2$

  Plant A: $H = 6$ **Plant B:** $H = 6$

  After one week, the height of Plant A and Plant B are both 6 inches.

Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard

Forsyth County Schools

Content Area	Mathematics
Grade/Course	8th grade
Unit of Study	Unit 4: Functions
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.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 a algebraic expression, determine which function has the greater rate of change.***

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Compare **Represent**	**Properties of functions** **Function table**	**1** **2**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Use properties of functions to convert between representations.	**How can I convert a function from one representation to another?**

Explanations and Examples

Examples:

- The table below shows the cost of renting a car. The company charges $45 a day for the car as well as charging a one-time $25 fee for the car's navigation system (GPS).Write an expression for the cost in dollars, *c,* as a function of the number of days, *d*.

  Students might write the equation $c = 45d + 25$ using the verbal description or by first making a table.

Days (*d*)	Cost (*c*) in dollars
1	70
2	115
3	160
4	205

Students should recognize that the rate of change is 45 (the cost of renting the car) and that initial cost (the first day charge) also includes paying for the navigation system. Classroom discussion about one time fees vs. recurrent fees will help students model contextual situations.

- When scuba divers come back to the surface of the water, they need to be careful not to ascend too quickly. Divers should not come to the surface more quickly than a rate of 0.75 ft per second. If the divers start at a depth of 100 feet, the equation $d = 0.75t - 100$ shows the relationship between the time of the ascent in seconds (*t)* and the distance from the surface in feet (*d*).
  - Will they be at the surface in 5 minutes? How long will it take the divers to surface from their dive?
- Make a table of values showing several times and the corresponding distance of the divers from the surface. Explain what your table shows. How do the values in the table relate to your equation?

Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard

Forsyth County Schools

Content Area	Math
Grade/Course	8th Grade
Unit of Study	Unit 6: Linear Models and Tables
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.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.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Construct	**Function**	2/3
Model	**Linear Relationship**	2 2/3
Determine	**Rate of change**	1 2/3
Read	**Initial value of a function**	
Interpret	**Initial value of a linear function**	

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Students will be able to determine and interpret the rate of change of a linear function using multiple criteria. (table, graph, ordered pairs, word problems) **Students will be able to determine and interpret the initial value of a linear function using multiple criteria. (table, graph, ordered pairs, word problems)**	**What is a rate of change?** **What is an initial value?** **How can we model a linear function?** **How can I find the rate of change?** **How can I find the initial value?**

Explanations and Examples

Examples:

- **The table below shows the cost of renting a car. The company charges $45 a day for the car as well as charging a one-time $25 fee for the car's navigation system (GPS).Write an expression for the cost in dollars, *c,* as a function of the number of days, *d*.**

  Students might write the equation $c = 45d + 25$ using the verbal description or by first making a table.

Days (*d*)	Cost (*c*) in dollars
1	70
2	115
3	160
4	205

Students should recognize that the rate of change is 45 (the cost of renting the car) and that initial cost (the first day charge) also includes paying for the navigation system. Classroom discussion about one time fees vs. recurrent fees will help students model contextual situations.

- **When scuba divers come back to the surface of the water, they need to be careful not to ascend too quickly. Divers should not come to the surface more quickly than a rate of 0.75 ft per second. If the divers start at a depth of 100 feet, the equation $d = 0.75t - 100$ shows the relationship between the time of the ascent in seconds (*t)* and the distance from the surface in feet (*d*).**
  - **Will they be at the surface in 5 minutes? How long will it take the divers to surface from their dive?**

Make a table of values showing several times and the corresponding distance of the divers from the surface. Explain what your table shows. How do the values in the table relate to your equation?

Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard Forsyth County Schools

Content Area	Mathematics
Grade/Course	8th grade
Unit of Study	Unit 1: Transformations, Congruence, and Similarity
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.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.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Understand	**Two-dimensional figure**	**1**
Describe	**Similarity**	**2**
Compare	**Congruence**	**2**
	Rotation	
	Reflection	
	Image	
	Pre-image	
	Translation	
	Dilation	

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)

CCGPS Unwrapped Standard

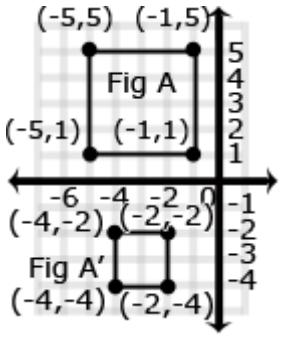
Forsyth County Schools

After transforming a two-dimensional figure, recognize the image is similar to the pre-image. **Describe the sequence of transformations applied to two-dimensional figures.**	**How can I tell if two-dimensional figures that have been transformed are similar?** **How can I determine what kind of transformations have been applied to two-dimensional figures that have been transformed are similar?**

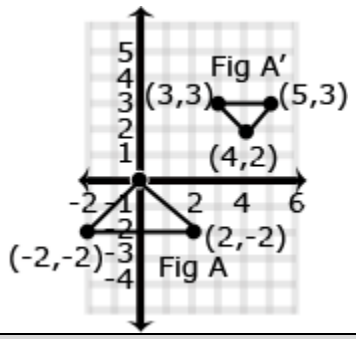
Explanation and Examples

Examples:

- Is Figure A similar to Figure A'? Explain how you know.



- Describe the sequence of transformations that results in the transformation of Figure A to Figure A'.



Next step, create assessments and engaging learning experiences

CCGPS Unwrapped Standard Forsyth County Schools

Content Area	Mathematics
Grade/Course	8th grade
Unit of Study	Unit 1: Transformations, Congruence, and Similarity
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.G.5 Use informal arguments to establish facts about the angle sum and exterior angles of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Concepts (what students need to know)	**Skills** (what students must be able to do)	**DOK Level / Bloom's**
Use	**Informal argument** **Exterior angles** **Angle sum of a triangle** **Parallel lines** **Transversals** **Angle-angle similarity**	**1** **1** **1**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Understand the relationship between the interior and exterior angles of a triangle. **When parallel lines are cut by a transversal recognize alternate interior, alternate exterior and corresponding angles.**	**How can I determine the measure of the exterior angle of a triangle?** **When I draw a transversal through parallel lines, what are the special angle relationships that occur?**

Explanations and Examples

- Examples: Students can informally prove relationships with transversals.

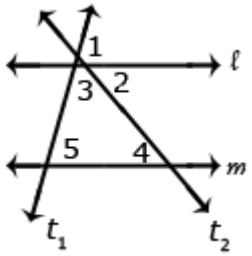
Show that m $\angle 3$ + *m* $\angle 4$ + *m* $\angle 5$ = 180˚ if ℓ and *m* are parallel lines and t_1 & t_2 are transversals.

$\angle 1$ + $\angle 2$ + $\angle 3$ = 180˚. Angle 1 and Angle 5 are congruent because they are corresponding angles ($\angle 5 \cong \angle 1$). $\angle 1$ can be substituted for $\angle 5$.

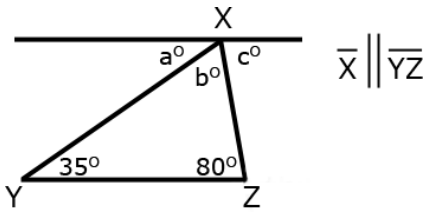
$\angle 4 \cong \angle 2$: because alternate interior angles are congruent.

$\angle 4$ can be substituted for $\angle 2$

Therefore m $\angle 3$ + m $\angle 4$ + m $\angle 5$ = 180˚



Students can informally conclude that the sum of a triangle is 180º (the angle-sum theorem) by applying their understanding of lines and alternate interior angles. In the figure below, line x is parallel to line *yz*:



$\overline{X} \parallel \overline{YZ}$

Angle *a* is 35º because it alternates with the angle inside the triangle that measures 35º. Angle *c* is 80º because it alternates with the angle inside the triangle that measures 80º. Because lines have a measure of 180º, and angles *a* + *b* + *c* form a straight line, then angle *b* must be 65 º (180 – 35 + 80 = 65). Therefore, the sum of the angles of the triangle are 35º + 65 º + 80 º

Next step, create assessments and engaging learning experiences

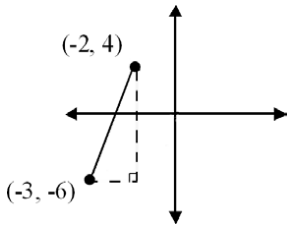
Content Area	Math
Grade/Course	8th Grade
Unit of Study	Unit 3: Geometric Applications of Exponents
Duration of Unit	

Insert a CCGPS standard below (include code). **CIRCLE** the **SKILLS** that students need to be able to do and **UNDERLINE** the **CONCEPTS** that students need to know.

MCC8.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.

Skills (what students must be able to do)	**Concepts** (what students need to know)	**DOK Level / Bloom's**
Apply **Determine**	**Pythagorean Theorem** **Right Triangles** **Real-World Problems** **Two & Three Dimension**	**2** **2/3**

Step 5: Determine BIG Ideas (enduring understandings students will remember long after the unit of study)	**Step 6: Write Essential Questions** (these guide instruction and assessment for all tasks. The big ideas are answers to the essential questions)
Apply the Pythagorean Theorem to solve real-world problems in two and three dimensions.	**When do I use the Pythagorean Theorem?** **What does the Pythagorean Theorem tell me?** **How do I know for which side I am solving?** **When will I use the Pythagorean Theorem in real life?** **How can I find the length of the diagonal in a box?**

Explanations and Examples
Through authentic experiences and exploration, students should use the Pythagorean Theorem to solve problems. Problems can include working in both two and three dimensions. Students should be familiar with the common Pythagorean triplets. **Students will create a right triangle from the two points given (as shown in the diagram below) and then use the Pythagorean Theorem to find the distance between the two given points.**   
Next step, create assessments and engaging learning experiences