<table>
<tr><td colspan="2">Subject: Mathematics 12-13
Grade Level: 8th
Unit Title: Algebra</td><td>Timeframe Needed for Completion: 9 weeks
Grading Period: 3rd Nine Weeks</td></tr>
<tr><td colspan="3">Big Idea/Theme: What's your Function?
Understandings:
Ratio, proportion, percent
Proportionality and similarity (including dilations)
Transformations
Congruent and Similar Figures
Parallel lines and Transversal
Pythagorean Theorem
Indirect Measurement</td></tr>
<tr><td colspan="2">Essential Questions:
How has equality or inequality shaped your life?
Equality or inequality? Explain.
What distinguishes one line from another?
How can you determine if things that look different are actually the same?
How could you determine how tall a person is from a picture without a measuring device?
What is important about knowing objects are similar?
How would sports be different if there were no ratios, proportions and percents?
How would your life be different if the right angle was never discovered?
How do we use the Pythagorean Theorem in everyday life?
How can the volume of 3D objects be used to solve real-world problem?</td><td>8.G.1 Understand congruence and similarity using physical models, transparencies or geometry software. Verify experimentally the properties of rotations, reflections and translations (NEW)

8.G.2 Understand congruence and similarity using physical models, transparencies or geometry software. 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. (NEW)

8.G.3 Understand congruence and similarity using physical models, transparencies or geometry software. Describe the effect of dilations, translations, rotations and reflections on two dimensional figures using coordinates. (NEW, moved</td></tr>
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Guiding Questions: How can you determine when lines have the same slope? How can you determine which line is steeper? What is the x and y intercept? If the x-intercept stays the same but the slope changes how is the line affected line? If the slope stays the same but the x-intercept or y-intercept changes, how does that affect the line? What determines if a line moves along the vertical axis? What determines if a line moves along the horizontal axis? Why do most linear equations have two variables? What determines if a dilation results in an enlargement? What determines if a dilation results in a reduction? What determines if a dilation results in a congruent figure? What effect does having a negative scale factor have on a figure? If a figure is dilated by a particular scale factor how is the perimeter and/or area affected? What is the relationship between ratio, proportion and percents? How is percent of change related to dilations? How can we tell that two figures are similar or congruent to each other? How can proportions help when trying to measure something that is too tall to measure by hand?	**from 6th grade)** **8.G.4 Understand congruence and similarity using physical models, transparencies or geometry software. 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 and translations; given two similar figures describe a sequence that exhibits the similarity between them. (NEW)** **8.G.5 Understand congruence and similarity using physical models, transparencies or geometry software. 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. (from Algebra 1)** **8.G.6 Understand and apply the Pythagorean Theorem. Explain a proof of the Pythagorean Theorem and its converse. (NEW)** **8.G.7 Understand and apply the Pythagorean Theorem. 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 Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. (from Algebra 1)**

Essential Skills/Vocabulary:		Assessment Tasks:
Vocabulary: Initial value Slope(m) Rate of change Ordered pair(x,y) Input Output Non-linear Qualitative Increase/decrease Independent Dependent Constant Rotation Reflection Translation Congruence Transformation Corresponding parts Properties Parallel lines Slope/rate of change Sequence Coordinate Figure Ordered pair Reflect Translate	Essential Skills: • Use ratios and similar figures to determine measurements that are difficult or inconvenient to find with direct measurement. • Apply ratios, similarity, and proportional reasoning to solve problems. • Recognize that a transformation of the form (x', y') = (ax, ay) is a dilation that enlarges or reduces the figure by a factor of a. • Use sample notation (see vocabulary bar) to describe dilations. • Use ratio, rates and proportions in real life situations • Recognize transformations such as rotations, reflections and dilations • Apply the understanding of parallel lines and their relationship to a transversal. • Use the Pythagorean Theorem in word problems and when dealing with right triangles	Class Discussions/Philosophical Chairs/Socratic Seminar Learning Logs Cornell Notes Think-Pair-Share Concept Maps Graphic Organizers Interactive Notebook Group work Projects Quick writes Foldables RAFTS Journals

Dilate Rotate Transformation Prime Image X-axis Dilation Transformation Similarity Congruent Similar Triangle Similar Parallel lines Transversal Congruent Supplementary Linear pair Corresponding Vertical Alternate, exterior, interior angles Pythagorean theorem Converse Proof Legs Hypotenuse Right angle Square root Radical Diagonals Ordered pair Coordinate plane Distance formula	Problem Solving Strategies • guess and test • make a table/chart/ • graph • make a diagram/picture • make an organized list • work backwards • work a simpler problem • extraneous information	

Materials Suggestions:

NCDPI Resources:
http://www.ncpublicschools.org/curriculum/mathematics/middlegrades/grade08/
http://mathlearnnc.sharpschool.com/cms/One.aspx?portalId=4507283&pageId=5149151
National Library of Manipulatives
http://nlvm.usu.edu/en/nav/vlibrary.html
NCTM Illuminations
http://illuminations.nctm.org/
Lesson Plan sites and Activities:
http://www.lessonplanspage.com/Math.htm
http://www.ilovemath.org
Math Graphic Organizers
http://www.enchantedlearning.com/graphicorganizers/math/

Problem Solving/Problem Websites
http://library.thinkquest.org/25459/learning/problem/
http://www.geom.uiuc.edu/~lori/mathed/problems/problist.html
http://www.rhlschool.com/math.htm
http://nces.ed.gov/nationsreportcard/itmrlsx/search.aspx

Currituck County Schools – Common Core Resources
http://www.currituck.k12.nc.us/Page/3021

Wheel of Theodoras Project- Using Pythagorean theorem to form spiraling right triangles to create a picture:
http://www.ldlewis.com/Teaching-Mathematics-with-Art/Wheels.html

AVID Library/Mathematics Write Path Books I and II