

<b>The Number System</b>		<b>Strand:</b> Know that there are numbers that are not rational, and approximate them by rational numbers.
<b>New Jersey Student Learning Standards:</b>		
<p><u>Math.Content.8.NS.A.1</u> 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.</p> <p><u>.Math.Content.8.NS.A.2</u> 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., <math>\pi^2</math>). <i>For example, by truncating the decimal expansion of <math>\sqrt{2}</math>, show that <math>\sqrt{2}</math> is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.</i></p>		
<b>Big Ideas:</b>		
<p>How can mathematical ideas be represented?          Why is it helpful to write numbers in different ways?</p>		
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>	
<ul style="list-style-type: none"> <li>How do mathematical ideas interconnect and build on one another to produce a coherent whole?</li> </ul>	<ul style="list-style-type: none"> <li>Numeric fluency that includes both the understanding of and the ability to appropriately use numbers.</li> </ul>	
<b>Knowledge, Skills, and Instructional Objectives:</b>		
<ul style="list-style-type: none"> <li>Understand irrational numbers as non-repeating, non-terminating decimals.</li> </ul>		
<b>Instructional Materials/Resources:</b>	<b>Suggested Vocabulary:</b>	
<p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u>          Glencoe: <u>Pre-Algebra</u>          Triumph Learning: <u>Common Core Coach Mathematics 8</u>          Glencoe: <u>Math Common Core Edition, Course 3</u></p>	<p>Terminating decimal, repeating decimal, rational and irrational number</p>	
	<b>Technology:</b>	
	<ul style="list-style-type: none"> <li>Calculator</li> <li>ActivBoard</li> <li>ipads</li> <li>Safari Montage</li> <li>Document camera</li> <li>Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>	
<b>Recommended Instructional Activities:</b>		
<ul style="list-style-type: none"> <li>Problem of the Day/Warm Up activity</li> <li>Direct Instruction</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>Cooperative group Activities</li> <li>Homework assignments</li> </ul>		

**Eastampton Township School District**

Curriculum Guide

Grade: 8<sup>th</sup> Grade    Content Area: Mathematics

**Extension Strategies/Activities:**

21<sup>st</sup> Century Career: Robotics Engineer

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**Cross-curricular Connections/Standards:**

RI.8.2; NJSLSA.W2; W.8.2; NJSLSA.SL2; SL.8.1

21<sup>st</sup> Century Skills

CRP1; CRP3; CRP6; CRP11; CRP12

**Suggested Assessments:**

- Problem of the Day
- Homework
- Developmental Assessments
- Summative Assessments
- Notebooks
- Final Exam
- Benchmarks
- Projects

<b>Expressions and Equations</b>		<b>Strand:</b> Expressions and Equations Work with radicals and integer exponents.
<b>New Jersey Student Learning Standards:</b>		
<p><u>Math.Content.8.EE.A.1</u> Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, <math>3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27</math>.</p> <p><u>Math.Content.8.EE.A.2</u> Use square root and cube root symbols to represent solutions to equations of the form <math>x^2 = p</math> and <math>x^3 = p</math>, where <math>p</math> is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that <math>\sqrt{2}</math> is irrational.</p> <p><u>Math.Content.8.EE.A.3</u> 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. <i>For example, estimate the population of the United States as 3 times <math>10^8</math> and the population of the world as 7 times <math>10^9</math>, and determine that the world population is more than 20 times larger.</i></p> <p><u>Math.Content.8.EE.A.4</u> 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</p>		
<b>Big Ideas:</b>		
<p>How can mathematical ideas be represented?          How can you communicate mathematical ideas effectively?          How can algebraic concepts be applied to geometry?          Why is it helpful to write numbers in different ways?</p>		
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>	
<p>How can measurements be used to solve problems?          How do mathematical ideas interconnect and build on one another to produce a coherent whole?          How do operations affect numbers?</p>	<ul style="list-style-type: none"> <li>• Measurements can be used to describe, compare and make sense of phenomena.</li> <li>• One representation may sometimes be more helpful than another; and used together, multiple representations give a fuller understanding of the problem. Numeric fluency includes both the understanding and the ability to appropriately use numbers.</li> <li>• The magnitude of numbers affects the outcome of operations on them.</li> </ul>	
<b>Knowledge, Skills, and Instructional Objectives:</b>		
<ul style="list-style-type: none"> <li>• Understand square roots as lengths of sides of squares.</li> <li>• Multiply, divide, and simplify expressions with exponents.</li> </ul>		
<b>Instructional Materials/Resources:</b>	<b>Suggested Vocabulary:</b>	
<p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u>          Glencoe: <u>Pre-Algebra</u>          Triumph Learning: <u>Common Core Coach Mathematics 8</u>          Glencoe: <u>Math Common Core Edition, Course 3</u></p>	<p>Coefficient, identity, multiplicative inverse, properties, null set, and scientific notation</p>	
	<b>Technology:</b>	
	<ul style="list-style-type: none"> <li>• Calculator</li> </ul>	

	<ul style="list-style-type: none"> <li>• ActivBoard</li> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
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<p><b>Recommended Instructional Activities:</b></p> <ul style="list-style-type: none"> <li>• Problem of the Day/Warm Up activity</li> <li>• Direct Instruction</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• Cooperative group Activities</li> <li>• Homework assignments</li> </ul>
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<p><b>Extension Strategies/Activities:</b></p> <p>21<sup>st</sup> Century Career: Robotics Engineer</p>	
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<p><b>Cross-curricular Connections/Standards:</b>        RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills        CRP1; CRP3; CRP6; CRP11; CRP12</p>
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<p><b>Suggested Assessments:</b></p> <ul style="list-style-type: none"> <li>• Problem of the Day</li> <li>• Homework</li> <li>• Developmental Assessments</li> <li>• Summative Assessments</li> <li>• Notebooks</li> <li>• Final Exam</li> <li>• Benchmarks</li> <li>• Projects</li> </ul>
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<p><b>Expressions and Equations</b></p>	<p><b>Strand:</b> Understand the connections between proportional relationships, lines, and linear equations.</p>
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<p><b>New Jersey Student Learning Standards:</b></p> <p><u>.Math.Content.8.EE.B.5</u> 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.</p> <p><u>.Math.Content.8.EE.B.6</u> Use similar triangles to explain why the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation <math>y = mx</math> for a line through the origin and the equation <math>y = mx + b</math> for a line intercepting the vertical axis at <math>b</math>.</p>
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<b>Big Ideas:</b>	
Why are graphs helpful?	
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>
<ul style="list-style-type: none"> <li>How can we use mathematical models to describe physical relationships?</li> </ul>	<ul style="list-style-type: none"> <li>Mathematical models can be used to describe and quantify physical relationships.</li> </ul>
<b>Knowledge, Skills, and Instructional Objectives:</b>	
<ul style="list-style-type: none"> <li>Understand that a function is a rule that assigns a unique output to each input, and that a graph of a function is a set of ordered pairs consisting of each input and corresponding output.</li> </ul>	
<b>Instructional Materials/Resources:</b>	<b>Suggested Vocabulary:</b>
<p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u>          Glencoe: <u>Pre-Algebra</u>          Triumph Learning: <u>Common Core Coach Mathematics 8</u>          Glencoe: <u>Math Common Core Edition, Course 3</u></p>	<p>Constant rate of change, rise, run, slope, slope-intercept form, x and y-intercept</p>
	<b>Technology:</b>
	<ul style="list-style-type: none"> <li>Calculator</li> <li>ActivBoard</li> <li>ipads</li> <li>Safari Montage</li> <li>Document camera</li> <li>Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
<b>Recommended Instructional Activities:</b>	
<ul style="list-style-type: none"> <li>Problem of the Day/Warm Up activity</li> <li>Direct Instruction</li> <li>Guided Practice</li> <li>Independent Practice</li> <li>Cooperative group Activities</li> <li>Homework assignments</li> </ul>	
<b>Extension Strategies/Activities:</b>	
<p>21<sup>st</sup> Century Career: Skateboard designer          21<sup>st</sup> Century Career: Mastering Engineer</p>	
<b>Cross-curricular Connections/Standards:</b>	
<p>RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills</p>	

CRP1; CRP3; CRP6; CRP11; CRP12

**Suggested Assessments:**

- Problem of the Day
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**Expressions and Equations**

**Strand:** Analyze and solve linear equations and pairs of simultaneous linear equations.

**New Jersey Student Learning Standards:**

.Math.Content.8.EE.C.7 Solve linear equations in one variable.

- .Math.Content.8.EE.C.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  $a = b$  results (where  $a$  and  $b$  are different numbers).
- .Math.Content.8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Math.Content.8.EE.C.8 Analyze and solve pairs of simultaneous linear equations.

- .Math.Content.8.EE.C.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.
- .Math.Content.8.EE.C.8b 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.*
- Math.Content.8.EE.C.8c 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.*

**Big Ideas:**

What is equivalence?

**Essential Questions:**

- How are patterns of change related to the behavior of functions?
- How can we use mathematical models to describe physical relationships?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- What makes an algebraic algorithm both effective and efficient?

**Enduring Understandings:**

- Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.
- Mathematical models can be used to describe and quantify physical relationships.
- Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole.
- One representation may sometimes be more helpful than another; and used together, multiple

	<p><b>representations give a fuller understanding of the problem. Numeric fluency includes both the understanding and the ability to appropriately use numbers.</b></p> <ul style="list-style-type: none"> <li>• <b>A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.</b></li> </ul>
<p><b>Knowledge, Skills, and Instructional Objectives:</b></p> <ul style="list-style-type: none"> <li>• Solve linear equations</li> <li>• Understand that a function is a rule that assigns a unique output to each input, and that a graph of a function is a set of ordered pairs consisting of each input and corresponding output.</li> <li>• Write and interpret symbolic expressions and statements.</li> <li>• Write and solve systems of linear equations.</li> </ul>	
<p><b>Instructional Materials/Resources:</b></p> <p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u>          Glencoe: <u>Pre-Algebra</u>          Triumph Learning: <u>Common Core Coach Mathematics 8</u>          Glencoe: <u>Math Common Core Edition, Course 3</u></p>	<p><b>Suggested Vocabulary:</b></p> <p>Substitution, systems of equations, point-slope form, standard form</p> <p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>• Calculator</li> <li>• ActivBoard</li> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
<p><b>Recommended Instructional Activities:</b></p> <ul style="list-style-type: none"> <li>• <b>Problem of the Day/Warm Up activity</b></li> <li>• <b>Direct Instruction</b></li> <li>• <b>Guided Practice</b></li> <li>• <b>Independent Practice</b></li> <li>• <b>Cooperative group Activities</b></li> <li>• <b>Homework assignments</b></li> </ul>	
<p><b>Extension Strategies/Activities:</b></p> <p>21<sup>st</sup> Century Career: Skateboard designer          21<sup>st</sup> Century Career: Mastering Engineer</p>	
<p><b>Cross-curricular Connections/Standards:</b>          RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills          CRP1; CRP3; CRP6; CRP11; CRP12</p>	

**Eastampton Township School District**

Curriculum Guide

Grade: 8<sup>th</sup> Grade Content Area: Mathematics

**Suggested Assessments:**

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<b>Functions</b>		<b>Strand:</b> Define, evaluate, and compare functions.
<b>New Jersey Student Learning Standards:</b>		
<p><u>.Math.Content.8.F.A.1</u> 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.<sup>1</sup></p> <p><u>.Math.Content.8.F.A.2</u> Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>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.</i></p> <p><u>.Math.Content.8.F.A.3</u> Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function <math>A = s^2</math> 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.</i></p>		
<b>Big Ideas:</b>		
<p>How can you find and use patterns to model real-world situations?          Why are graphs helpful?          How can we use functions to model relationships between quantities?</p>		
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>	
<ul style="list-style-type: none"> <li>• How can change be best represented mathematically?</li> <li>• How are patterns of change related to the behavior of functions?</li> <li>• How can we use mathematical models to describe physical relationships?</li> </ul>	<ul style="list-style-type: none"> <li>• The symbolic language of algebra is used to communicate and generalize patterns and relationships.</li> <li>• Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.</li> <li>• Algebraic numeric procedures are interconnected and build on one another to produce a coherent whole.</li> <li>• Mathematical models can be used to describe and quantify physical relationships.</li> </ul>	
<b>Knowledge, Skills, and Instructional Objectives:</b>		
<ul style="list-style-type: none"> <li>• Recognize linear and nonlinear functions from verbal descriptions, tables, and graphs and describe those patterns using words and equations.</li> <li>• Solve linear equations</li> <li>• Use linear and inverse equations to solve problems and make predictions.</li> <li>• Understand that a function is a rule that assigns a unique output to each input, and that a graph of a function is a set of ordered pairs consisting of each input and corresponding output.</li> <li>• Build and analyze an exponential model.</li> <li>• Attach contextual meaning to equations.</li> <li>• Graph linear functions in the form <math>y = mx + b</math> and <math>ax + by = c</math>.</li> </ul>		
<b>Instructional Materials/Resources:</b>	<b>Suggested Vocabulary:</b>	
<p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u></p>	<p>Function, domain, range, relation, independent and dependent variable, linear equation and function, nonlinear function, and</p>	

<p><b>Glencoe: <u>Pre-Algebra</u></b>  <b>Triumph Learning: <u>Common Core Coach Mathematics 8</u></b>  <b>Glencoe: <u>Math Common Core Edition, Course 3</u></b></p>	<p><b>quadratic function</b></p> <hr/> <p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>• Calculator</li> <li>• ActivBoard</li> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
<p><b>Recommended Instructional Activities:</b></p> <ul style="list-style-type: none"> <li>• Problem of the Day/Warm Up activity</li> <li>• Direct Instruction</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• Cooperative group Activities</li> <li>• Homework assignments</li> </ul>	
<p><b>Extension Strategies/Activities:</b></p> <p>21<sup>st</sup> Century Career: Physical Therapist          21<sup>st</sup> Century Career: Mastering Engineer</p>	
<p><b>Cross-curricular Connections/Standards:</b>          RI.8.2; NJSLSA.W2; W.8.2; NJSLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills          CRP1; CRP3; CRP6; CRP11; CRP12</p>	
<p><b>Suggested Assessments:</b></p> <ul style="list-style-type: none"> <li>• Problem of the Day</li> <li>• Homework</li> <li>• Developmental Assessments</li> <li>• Summative Assessments</li> <li>• Notebooks</li> <li>• Final Exam</li> <li>• Benchmarks</li> <li>• Projects</li> </ul>	
<p><b>Functions</b></p>	<p><b>Strand:</b> Use functions to model relationships between quantities.</p>
<p><b>New Jersey Student Learning Standards:</b></p>	

.Math.Content.8.F.B.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.

.Math.Content.8.F.B.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.

**Big Ideas:**

How can we use functions to model relationships between quantities?  
 Why are graphs helpful?

**Essential Questions:**

- How are patterns of change related to the behavior of functions?
- How can we use physical models to describe physical relationships?
- How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations.
- What makes an algebraic algorithm both effective and efficient?
- How can we use mathematical models to describe physical relationships?
- How can we use physical models to clarify mathematical relationships?

**Enduring Understandings:**

- Algebraic representation can be used to generalize patterns and relationships.
- Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole.
- Physical models can be used to describe and quantify physical relationships.
- Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.
- Mathematical models can be used to describe and quantify physical relationships.
- Physical models can be used to clarify mathematical relationships.

**Knowledge, Skills, and Instructional Objectives:**

- Solve linear equations
- Build and analyze an exponential model.
- Make sense of the symbols used in  $y = a(b)^x$
- Calculate growth based on growth rates.
- Recognize linear and nonlinear functions from verbal descriptions, tables, and graphs and describe those patterns using words and equations.
- Recognize and describe situations that can be modeled by an exponential function.
- Analyze quadratic relationships by examining patterns of change in table, graph, and symbolic representations.

**Instructional Materials/Resources:**

Glencoe: Mathematics – Applications and Concepts-Course 3  
 Glencoe - Algebra 1  
 Glencoe: Pre-Algebra  
 Triumph Learning: Common Core Coach Mathematics 8  
 Glencoe: Math Common Core Edition, Course 3

**Suggested Vocabulary:**

Function, domain, range, relation, independent and dependent variable, linear equation and function, nonlinear function, and quadratic function

	<b>Technology:</b> <ul style="list-style-type: none"><li>• Calculator</li><li>• ActivBoard</li><li>• ipads</li><li>• Safari Montage</li><li>• Document camera</li><li>• Study island</li></ul> 8.1.2.A.4; 8.1.P.C.1
<b>Recommended Instructional Activities:</b> <ul style="list-style-type: none"><li>• Problem of the Day/Warm Up activity</li><li>• Direct Instruction</li><li>• Guided Practice</li><li>• Independent Practice</li><li>• Cooperative group Activities</li><li>• Homework assignments</li></ul>	
<b>Extension Strategies/Activities:</b>  21 <sup>st</sup> Century Career: Physical Therapist 21 <sup>st</sup> Century Career: Mastering Engineer	
<b>Cross-curricular Connections/Standards:</b> RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1  21 <sup>st</sup> Century Skills CRP1; CRP3; CRP6; CRP11; CRP12	
<b>Suggested Assessments:</b> <ul style="list-style-type: none"><li>• Problem of the Day</li><li>• Homework</li><li>• Developmental Assessments</li><li>• Summative Assessments</li><li>• Notebooks</li><li>• Final Exam</li><li>• Benchmarks</li><li>• Projects</li></ul>	

<b>Geometry</b>	<b>Strand:</b> Understand congruence and similarity using physical models, transparencies, or geometry software.
<b>New Jersey Student Learning Standards:</b>	
<p><u>.Math.Content.8.G.A.1</u> Verify experimentally the properties of rotations, reflections, and translations:</p> <ul style="list-style-type: none"> <li>• <u>.Math.Content.8.G.A.1a</u> Lines are taken to lines, and line segments to line segments of the same length.</li> <li>• <u>.Math.Content.8.G.A.1b</u> Angles are taken to angles of the same measure.</li> <li>• <u>.Math.Content.8.G.A.1c</u> Parallel lines are taken to parallel lines.</li> </ul> <p><u>Math.Content.8.G.A.2</u> 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.</p> <p><u>Math.Content.8.G.A.3</u> Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p><u>.Math.Content.8.G.A.4</u> 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.</p> <p><u>.Math.Content.8.G.A.5</u> 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. <i>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.</i></p>	
<p><b>Big Ideas:</b></p> <p>How can algebraic concepts be applied to geometry?        How can we best show or describe the change in position of a figure?        How can you determine congruence and similarity?        Why are formulas important in Math and Science?</p>	
<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• What situations can be analyzed using transformations and symmetries?</li> <li>• How can we best represent and verify geometric/algebraic relationships?</li> <li>• How can spatial relationships be described by careful use of geometric language?</li> <li>• How can measurements be used to solve problems?</li> </ul>	<p><b>Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>• Shape and area can be conserved during mathematical transformations.</li> <li>• Coordinate geometry can be used to represent and verify geometric/algebraic relationships.</li> <li>• Geometric properties can be used to construct geometric figures.</li> <li>• Measurements can be used to describe, compare, and make sense of phenomena.</li> </ul>
<p><b>Knowledge, Skills, and Instructional Objectives:</b></p> <ul style="list-style-type: none"> <li>• Recognize symmetry in design; determine the design element that has been reflected, rotated, or translated to produce a design with symmetry</li> <li>• Describe rigid motions in words and with coordinate rules.</li> <li>• Relate rigid motions to the concept of symmetry and congruence of figures.</li> <li>• Describe the effects of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.</li> <li>• Describe the sequence of translations, rotations, reflections, or dilations that exhibits the similarity of two similar figures.</li> </ul>	

**Eastampton Township School District**

Curriculum Guide

Grade: 8<sup>th</sup> Grade Content Area: Mathematics

- Using facts about angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and angle-angle criterion for similarity of triangles, find the measurements of angles.

**Instructional Materials/Resources:**

Glencoe: Mathematics – Applications and Concepts-Course 3  
Glencoe - Algebra 1  
Glencoe: Pre-Algebra  
Triumph Learning: Common Core Coach Mathematics 8  
Glencoe: Math Common Core Edition, Course 3

**Suggested Vocabulary:**

Alternate interior and exterior angles, corresponding angles, exterior angles, interior angles, legs, regular polygon, transversal

**Technology:**

- Calculator
- ActivBoard
- ipads
- Safari Montage
- Document camera
- Study island

8.1.2.A.4; 8.1.P.C.1

**Recommended Instructional Activities:**

- Problem of the Day/Warm Up activity
- Direct Instruction
- Guided Practice
- Independent Practice
- Cooperative group Activities
- Homework assignments

**Extension Strategies/Activities:**

21<sup>st</sup> Century Career: Computer Animator  
21<sup>st</sup> Century Career: Travel Agent  
21<sup>st</sup> Century Career: Car Design

**Cross-curricular Connections/Standards:**

RI.8.2; NJSLA.W2; W.8.2; NJSLA.SL2; SL.8.1

21<sup>st</sup> Century Skills  
CRP1; CRP3; CRP6; CRP11; CRP12

**Suggested Assessments:**

- Problem of the Day

<ul style="list-style-type: none"> <li>• Homework</li> <li>• Developmental Assessments</li> <li>• Summative Assessments</li> <li>• Notebooks</li> <li>• Final Exam</li> <li>• Benchmarks</li> <li>• Projects</li> </ul>	
<b>Geometry</b>	<b>Strand:</b> Understand and apply the Pythagorean Theorem.
<p><b>New Jersey Student Learning Standards</b></p> <p><u>.Math.Content.8.G.B.6</u> Explain a proof of the Pythagorean Theorem and its converse.</p> <p><u>Math.Content.8.G.B.7</u> Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</p> <p><u>Math.Content.8.G.B.8</u> Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>	
<p><b>Big Ideas:</b></p> <p>How can algebraic concepts be applied to geometry?</p>	
<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• How do we decide when to use an exact answer and when to use an estimate?</li> </ul>	<p><b>Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>• Context is critical when using estimation.</li> </ul>
<p><b>Knowledge, Skills, and Instructional Objectives:</b></p> <ul style="list-style-type: none"> <li>• Explain a proof of the Pythagorean Theorem and its converse.</li> <li>• Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.</li> <li>• Apply the Pythagorean Theorem to find the distance between two points in a coordinate</li> </ul>	
<p><b>Instructional Materials/Resources:</b></p> <p>Glencoe: <b>Mathematics – Applications and Concepts-Course 3 Algebra 1</b></p> <p>Glencoe: <b>Pre-Algebra</b></p> <p>Triumph Learning: <b>Common Core Coach Mathematics 8</b></p> <p>Glencoe: <b>Math Common Core Edition, Course 3</b></p>	<p><b>Suggested Vocabulary:</b></p> <p>Distance Formula, hypotenuse, Pythagorean Theorem</p> <hr/> <p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>• Calculator</li> <li>• ActivBoard</li> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>

<b>Recommended Instructional Activities:</b> <ul style="list-style-type: none"> <li>• Problem of the Day/Warm Up activity</li> <li>• Direct Instruction</li> <li>• Guided Practice</li> <li>• Independent Practice</li> <li>• Cooperative group Activities</li> <li>• Homework assignments</li> </ul>	
<b>Extension Strategies/Activities:</b>  21 <sup>st</sup> Century Career: Travel Agent	<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Cross-curricular Connections/Standards:</b> RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1  21 <sup>st</sup> Century Skills CRP1; CRP3; CRP6; CRP11; CRP12	
<b>Suggested Assessments:</b> <ul style="list-style-type: none"> <li>• Problem of the Day</li> <li>• Homework</li> <li>• Developmental Assessments</li> <li>• Summative Assessments</li> <li>• Notebooks</li> <li>• Final Exam</li> <li>• Benchmarks</li> <li>• Projects</li> </ul>	
<b>Geometry</b>	<b>Strand:</b> Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
<b>New Jersey Student Learning Standards:</b>	
<u>.Math.Content.8.G.C.9</u> Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	
<b>Big Ideas:</b>  Why are formulas important in math and science?	
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>



<ul style="list-style-type: none"> <li>• <b>How can measurements be used to solve problems?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Measurements can be used to describe, compare, and make sense of phenomena</b></li> </ul>
<p><b>Knowledge, Skills, and Instructional Objectives:</b></p> <ul style="list-style-type: none"> <li>• Calculate the volume of cones, cylinders, and spheres and use them to solve real-world world and mathematical problems.</li> </ul>	
<p><b>Instructional Materials/Resources:</b></p> <p>Glencoe: <b>Mathematics – Applications and Concepts-Course 3</b>          Glencoe - <b>Algebra 1</b>          Glencoe: <b>Pre-Algebra</b>          Triumph Learning: <b>Common Core Coach Mathematics 8</b>          Glencoe: <b>Math Common Core Edition, Course 3</b></p>	<p><b>Suggested Vocabulary:</b></p> <p>Composite solids, cone, cylinder, hemisphere, lateral area, nets, polyhedron, precision, prism, similar solids, sphere, surface are, volume</p> <p><b>Technology:</b></p> <ul style="list-style-type: none"> <li>• Calculator</li> <li>• ActivBoard</li> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
<p><b>Recommended Instructional Activities:</b></p> <ul style="list-style-type: none"> <li>• <b>Problem of the Day/Warm Up activity</b></li> <li>• <b>Direct Instruction</b></li> <li>• <b>Guided Practice</b></li> <li>• <b>Independent Practice</b></li> <li>• <b>Cooperative group Activities</b></li> <li>• <b>Homework assignments</b></li> </ul>	
<p><b>Extension Strategies/Activities:</b></p> <p>21<sup>st</sup> Century Career: Space Architect</p>	<ul style="list-style-type: none"> <li>•</li> </ul>
<p><b>Cross-curricular Connections/Standards:</b>          RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills          CRP1; CRP3; CRP6; CRP11; CRP12</p>	
<p><b>Suggested Assessments:</b></p> <ul style="list-style-type: none"> <li>• Problem of the Day</li> <li>• Homework</li> <li>• Developmental Assessments</li> </ul>	

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- Summative Assessments
- Notebooks
- Final Exam
- Benchmarks
- Projects

<b>Statistics and Probability</b>		<b>Strand:</b> Investigate patterns of association in bivariate data.
<b>New Jersey Student Learning Standards:</b>		
<p><u>.Math.Content.8.SP.A.1</u> 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.</p> <p><u>.Math.Content.8.SP.A.2</u> 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.</p> <p><u>.Math.Content.8.SP.A.3</u> Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. <i>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.</i></p> <p><u>Math.Content.8.SP.A.4</u> 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. <i>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?</i></p>		
<b>Big Ideas:</b>		
How are patterns used when comparing two quantities?		
<b>Essential Questions:</b>	<b>Enduring Understandings:</b>	
<ul style="list-style-type: none"> <li>• What makes an algebraic algorithm both effective and efficient?</li> <li>• How are patterns of change related to the behavior of functions?</li> <li>• How can the collection, organization, interpretation, and display of data be used to answer questions?</li> <li>• How can experimental and theoretical probabilities be used to make predictions or draw conclusions?</li> </ul>	<ul style="list-style-type: none"> <li>• Patterns and relationships can be represented graphically, numerically, symbolically, or verbally.</li> <li>• Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole.</li> <li>• The message conveyed by the data depends on how the data is collected, represented, and summarized.</li> <li>• The result of a statistical investigation can be used to support or refute an argument.</li> </ul>	
<b>Knowledge, Skills, and Instructional Objectives:</b>		
<ul style="list-style-type: none"> <li>• Solve linear equations.</li> <li>• Graph linear functions in the form <math>y = mx + b</math> and <math>ax + by = c</math>.</li> <li>• Develop a linear equation to characterize a display of data on a scatter plot.</li> <li>• Construct and interpret two-way tables summarizing bivariate data, categorical data, including relative frequencies.</li> </ul>		
<b>Instructional Materials/Resources:</b>	<b>Suggested Vocabulary:</b>	
<p>Glencoe: <u>Mathematics – Applications and Concepts-Course 3</u>          Glencoe - <u>Algebra 1</u>          Glencoe: <u>Pre-Algebra</u>          Triumph Learning: <u>Common Core Coach Mathematics 8</u>          Glencoe: <u>Math Common Core Edition, Course 3</u></p>	<p>Bivariate data, line of best fit, scatter plot, relative frequency, standard deviation, and outlier</p>	
	<b>Technology:</b>	
	<ul style="list-style-type: none"> <li>• Calculator</li> <li>• ActivBoard</li> </ul>	

	<ul style="list-style-type: none"> <li>• ipads</li> <li>• Safari Montage</li> <li>• Document camera</li> <li>• Study island</li> </ul> <p>8.1.2.A.4; 8.1.P.C.1</p>
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<p><b>Extension Strategies/Activities:</b></p> <p>21<sup>st</sup> Century Career: Sports Marketer</p>	<ul style="list-style-type: none"> <li>•</li> </ul>
<p><b>Cross-curricular Connections/Standards:</b>          RI.8.2; NJLSA.W2; W.8.2; NJLSA.SL2; SL.8.1</p> <p>21<sup>st</sup> Century Skills          CRP1; CRP3; CRP6; CRP11; CRP12</p>	
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<p><b>Modifications for SpEd/ELL/Students at Risk/Gifted</b>  <b>Supports, Accommodations, and Modifications must be provided as stated in IEP, 504 Plan or I-Team Intervention Plan, and may include (but not limited to) the following:</b>  <b>Presentation accommodations:</b></p> <ul style="list-style-type: none"> <li>• Listen to audio recordings instead of reading text</li> <li>• Learn content from audio books, movies, videos and digital media instead of reading print versions</li> <li>• Use alternate texts at lower readability level</li> <li>• Work with fewer items per page or line and /or materials in a larger print size</li> <li>• Use magnification device, screen reader, or Braille/Nemeth Code</li> <li>• Use audio amplification device (e.g., hearing aide(s), auditory trainer, sound-field system( which may require teacher use of microphone)</li> <li>• Be given a written lists of instructions</li> <li>• Record a lesson, instead of taking notes</li> <li>• Have another student share class notes with him</li> </ul>	

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- Be given an outline of lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use visual presentations of verbal material, such as word webs and visual organizers
- Use manipulatives to teach or demonstrate concepts
- Have curriculum materials translated into native language

**Response accommodations:**

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses to an audio recorder
- Use a spelling dictionary or electronic spell-checker
- Use a word processor to type notes or give responses in class
- Use a calculator or table or "math facts"
- Respond directly in the test booklet rather than on an answer sheet.

**Setting accommodations:**

- Work or take a test in a different setting, such as quiet room with few distractions
- Sit where he learns best (for example, near the teacher, away from distractions)
- Use special lighting or acoustics
- Take a test in small group setting
- Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)
- Use noise buffers such as headphones, earphones, or earplugs

**Timing accommodations:**

- Take more time to complete a task or a test
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

**Scheduling accommodations:**

- Take more time to complete a project
- Take a test in several timed sessions or over several days
- Take sections of a test in a different order
- Take a test at a specific time of day

**Organization skills accommodations:**

- Use an alarm to help with time management
- Mark texts with a highlighter
- Have help coordinating assignments in a book or planner
- Receive study skills instruction

**Assignment modifications:**

- Complete fewer or different homework problems than peers
- Write shorter paper
- Answer fewer or different test questions
- Create alternate projects or assignments

**Curriculum modifications:**

- Learn different material (such as continuing to work on multiplication while classmates move on to fractions, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get graded or assessed using a different standard than the one for classmates