

# **NJ-CCSS AREA: MATHEMATICS**

**North Brunswick Township Public Schools**

## **HONORS GEOMETRY**

### **Acknowledgements**

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**New: May 2012**

**Revision \_\_\_\_\_**

**Board Adoption \_\_\_\_\_**

## New Jersey - Common Core State Standard for Mathematics

### Unit 1: Tools of Geometry

Grades: 9-10

Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-GMD.4</b> Geometric Measurement and Dimension</p> <ul style="list-style-type: none"> <li>How can you represent a three dimensional figure with a two dimensional drawing?</li> </ul>		<p><b>G-GMD.4 Visualize relationships between two dimensional and three dimensional objects.</b> Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.  <b>SMP.4</b> Model with mathematics.  <b>SMP.7</b> Look for and make use of structure.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 1.1</b> Make isometric and orthographic drawings. Draw nets for 3-D figures.</p>	<ul style="list-style-type: none"> <li>Define isometric drawing, orthographic drawing, and foundation drawing and net</li> <li>Use color cubes to model 3-D structures and create necessary drawings</li> <li><b>Technology:</b> Geometer’s Sketchpad. Students use computer to draw and investigate geometric shapes and properties</li> <li>Use manipulatives to discover the unfolding of nets</li> </ul> <p><b>Materials/Technology/Resources:</b> Cubes, Isometric dot paper, Plastic nets, Rulers, Protractors, Calculators, Compasses, Geometer’s Sketchpad <u>Geometry</u>. Pearson, 2012</p> <p><b>Interdisciplinary Connections:</b> Pg. 8 Example 23</p>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>KWL strategies</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Simulations</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 1.1-1.5</li> </ul> <p><b>Performance Assessment:</b></p> <ul style="list-style-type: none"> <li>Isometric Drawing Project</li> </ul>	1 day

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-MG</b> Modeling with Geometry</p> <p><b>G-CO</b> Congruence</p> <ul style="list-style-type: none"> <li>• What are the building blocks of geometry?</li> <li>• How can you describe the attributes of a segment or angle?</li> </ul>		<p><b>G-CO.1 Experiment with transformations in the plane.</b> Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</p> <p><b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles.</p> <p><b>G-CO.12 Make geometric constructions.</b> Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).</p> <p><b>G-MG.1 Apply geometric concepts in modeling situations.</b> Use geometric shapes, their measures, and their properties to describe objects.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.5</b> Use appropriate tools strategically.</p> <p><b>SMP.6</b> Attend to precision.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 1.2</b> Understand basic terms and postulates of geometry.</p> <p><b>Obj. 1.3</b> Find and compare lengths of segments.</p> <p><b>Obj. 1.4</b> Find and compare the measure of angles.</p> <p><b>Obj. 1.5</b> Identify special angle pairs and use the relationships to find angle measures</p> <p><b>Obj. 1.6</b> Make basic constructions using a straightedge and a compass.</p>	<ul style="list-style-type: none"> <li>• Define key terms and present visual examples</li> <li>• Stress correct notation</li> <li>• Compare methods of reasoning to introduce postulates; illustrate postulates with visual representations (index cards and string)</li> <li>• True-false and always, sometimes, never questions as understanding of postulates</li> <li>• <b>Technology:</b> Geometer's Sketchpad. Students use computer to draw and investigate geometric shapes and properties</li> <li>• Measure segments with a ruler and angles using a protractor</li> <li>• Find measurements indirectly using algebra</li> <li>• Introduce Ruler Postulate and Segment Addition Postulate with visual examples</li> <li>• Solve algebraic problems using properties of special angles</li> <li>• Activity: Pair students up to complete constructions using a compass and a ruler. Demonstrate to students methods of using the compass and ruler together to form segments, angles, and bisectors of angles</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• KWL strategies</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Simulations</li> <li>• Pair-share</li> <li>• Notating guides</li> <li>• Previewing materials</li> <li>• Stations Centers</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Quiz 1.1-1.4</li> <li>• Quiz 1.5-1.7</li> </ul>	8 days

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-GPE</b> Expressing Geometric Properties with Equations <ul style="list-style-type: none"> <li>How can we best represent and verify geometric/algebraic relationships?</li> </ul>		<b>G-GPE.4 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to prove simple geometric theorems algebraically. <b>G-GPE.7 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.5</b> Use appropriate tools strategically.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 1.7</b> Find the midpoint of a segment. Find the distance between two points on the coordinate plane.	<ul style="list-style-type: none"> <li>Introduce Distance Formula and Midpoint Formula and apply to real-life situations (for example, find a driving distance, etc.)</li> <li>Emphasize correct algebraic processes in applying formulas</li> <li>Use formulas to verify geometric properties such as the diagonals of a parallelogram bisect each other and the midsegment of a triangle is half the length of the third side</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>KWL strategies</li> <li>Highlighting/and underlining</li> <li>Simulations</li> <li>Notating guides</li> <li>Previewing materials</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>Quiz 1.5-1.7</li> </ul>	1 day

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice	
<p><b>G-MG</b> Modeling with Geometry</p> <p><b>G-GPE</b> Expressing Geometric Properties with Equations</p> <ul style="list-style-type: none"> <li>How can measurements be used to solve problems?</li> </ul>		<p><b>G-MG.1 Apply geometric concepts in modeling situations.</b> Use geometric shapes, their measures, and their properties to describe objects.</p> <p><b>G-GPE.7 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.4</b> Model with mathematics.</p> <p><b>SMP.5</b> Use appropriate tools strategically.</p>	
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks
<p><b>Obj. 1.8</b> Find the perimeter and circumference of basic shapes.</p> <p><b>Obj. 1.9</b> Find the area of basic shapes.</p>	<ul style="list-style-type: none"> <li>Review perimeter and area of all squares, rectangles, and circles using formulas and matching diagrams</li> <li>Find areas of irregular regions</li> <li>Apply formulas to solve real-world problems</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Graphic organizers</li> <li>Color coding</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Games and puzzles</li> <li>Stations/centers</li> <li>Small group instruction</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Chapter 1 Test</li> </ul>

**Unit 2: Reasoning and Proof**

**Grades: 9-10**

**Date: May 2012**

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-CO</b> Congruence  • How can you make a conjecture and prove that it is true?		<b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.2</b> Reason abstractly and quantitatively. <b>SMP.3</b> Construct viable arguments and critique the reasoning of others. <b>SMP.8</b> Look for and express regularity in repeated reasoning.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 2.1</b> Use inductive reasoning to make conjectures.</p> <p><b>Obj. 2.2</b> Recognize conditional statements and their parts. To Write converses, inverses, and contrapositives of conditionals.</p> <p><b>Obj. 2.3</b> Write biconditionals and recognize good definitions.</p> <p><b>Obj. 2.4</b> Use the Law of Detachment and the Law of Syllogism.</p> <p><b>Obj. 2.5</b> Connect reasoning in Algebra and Geometry.</p>	<ul style="list-style-type: none"> <li>Define inductive reasoning, conjectures, and counterexamples</li> <li>Use inductive reasoning to complete patterns</li> <li>Assess examples where conjectures are false (example of points on a circle are joined to make nonoverlapping regions)</li> <li>Define conditional, hypothesis, conclusion, truth value, converse, biconditional, deductive reasoning, Law of Detachment, Law of Syllogism</li> <li>Use examples of Lewis Carroll</li> <li>Identify the hypothesis and conclusion in statements</li> <li>Write a sentence as a conditional or biconditional statement</li> <li>Use Venn diagrams to write converses and determine truth values, support decision by providing a counterexample</li> <li>Write a conditional and its converse as a biconditional</li> <li>Separate biconditional into two separate conditionals</li> <li>Illustrate both Laws using previous examples</li> <li>State and discuss Properties of Equality, Congruence, and the Distributive Property</li> <li>Solve for variables in diagrams and justify each step</li> </ul> <p><b>Materials/Technology/Resources:</b> Calculators, Rulers <u>Geometry</u>. Pearson, 2012</p> <p><b>Interdisciplinary Connections:</b> Literature – Examples of Lewis Carroll</p>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Alternative assessments</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Daily record-keeping assistance</li> <li>Graphic organizers</li> <li>Color coding</li> <li>Highlighting/and underlining</li> <li>Cue cards</li> <li>“Think alouds”</li> <li>Small group instruction</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 2.1-2.4</li> </ul>	5 days

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-CO</b> Congruence  <ul style="list-style-type: none"> <li>How can spatial relationships be described by careful use of geometric language?</li> </ul>		<b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles.  <b>SMP.1</b> Make sense of problems and persevere in solving them.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 2.6</b> Prove and apply theorems about angles.	<ul style="list-style-type: none"> <li>Introduce vertical angles theorem, congruent supplements theorem, congruent complements theorem</li> <li>Explore and discuss reasoning to support theorems using diagrams</li> <li>Apply theorems to solve various problems</li> <li>Work on algebraic applications as well as short proofs</li> <li>Introduce paragraph proof</li> <li>Write conclusions as well as justifications from marked diagrams</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Mnemonics</li> <li>Color coding</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Think-Tac-Toe</li> <li>Small group instruction</li> <li>Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>Chapter 2 Test</li> </ul>	2 days

## Unit 3: Parallel and Perpendicular Lines

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-CO</b> Congruence <b>G-MG</b> Modeling with Geometry <ul style="list-style-type: none"> <li>How do you prove that two lines are parallel or perpendicular?</li> </ul>		<b>G-CO.1 Experiment with transformations in the plane.</b> Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. <b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles. <b>G-CO.10 Prove geometric theorems.</b> Prove theorems about triangles. <b>G-MG.3 Apply geometric concepts in modeling situations.</b> Apply geometric methods to solve design problems.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.2</b> Reason abstractly and quantitatively. <b>SMP.8</b> Look for and express regularity in repeated reasoning.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 3.1</b> Identify relationships between figures and space. Identify angles formed by two lines and a transversal.</p> <p><b>Obj. 3.2</b> Prove theorems about parallel lines. Use properties of parallel lines to find angle measures.</p> <p><b>Obj. 3.3</b> Determine whether two lines are parallel.</p> <p><b>Obj. 3.4</b> Relate parallel and perpendicular lines.</p>	<ul style="list-style-type: none"> <li>Have students discover properties of angle pairs by drawing lines and transversals and measuring angles</li> <li>Define transversal, alternate interior angles, same-side interior angles, corresponding angles, alternate exterior angles, same-side exterior angles, two-column proof</li> <li>Introduce postulates related to parallel lines cut by a transversal and illustrate using diagrams</li> <li>Apply postulates and theorems to solve problems</li> <li>Complete short two-column proofs</li> <li>State all theorems and converses in if-then form</li> <li>Illustrate and solve “crook” problems</li> <li>Introduce converses to postulates and theorems and use to find solutions to real-world situations</li> <li>Use converses to solve geometric diagrams</li> <li>Introduce theorems and discuss proofs that justify each theorem</li> </ul> <p><b>Materials/Technology/Resources:</b> Rulers, Compasses, Calculators, Graph Paper <u>Geometry</u>. Pearson, 2012</p>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Graphic organizers</li> <li>Mnemonics</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Small group instruction</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 3.1-3.4</li> </ul>	6 days



	<b><u>Interdisciplinary Connections:</u></b> Pg. 143 Example 3				
<b>NJ-CCSS Domain Essential Questions</b>		<b>NJ-CCSS Cluster. Standard Standards for Mathematical Practice</b>			
<b>G-CO</b> Congruence <ul style="list-style-type: none"> <li>• What is the sum of the measures of the angles of a triangle?</li> </ul>		<b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles. <b>G-CO.10 Prove geometric theorems.</b> Prove theorems about triangles. <b>G-CO.12 Make geometric constructions.</b> Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <b>G-CO.13 Make geometric constructions.</b> Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.			
<b>Skills/Objectives</b>  SWBAT...	<b>Instructional Strategies</b> Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	<b>Modifications</b> ESL / Special Education Academic Support/G&T Differentiated Instruction	<b>Assessments</b> Formative Summative Benchmarks	<b>Pacing</b>	
<b>Obj. 3.5</b> Use parallel lines to prove a theorem about triangles. Find the measures of angles of triangles.  <b>Obj. 3.6</b> Construct parallel and perpendicular lines.	<ul style="list-style-type: none"> <li>• Review angle types based on measure</li> <li>• Introduce triangle names based on measure of angles and sides Use names to classify triangles</li> <li>• Introduce Triangle Angle-Sum Theorem using activity on Pg. 171, and use to solve for missing angles and variables in triangles</li> <li>• Introduce and illustrate Triangle Exterior Angle Theorem</li> <li>• Use the basic constructions to create right triangles, parallelograms, rectangles, and squares</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Group investigations</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Music or movement</li> <li>• Simulations</li> <li>• Small group instruction</li> <li>• Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> </ul>	3 days	

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-GPE</b> Expressing Geometric Properties with Equations  • How do you write an equation of a line in the coordinate plane?		<b>G-GPE.5 Use coordinates to prove simple geometric theorems algebraically.</b> Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 3.7</b> Graph and write linear equations.  <b>Obj. 3.8</b> Relate slope to parallel and perpendicular lines.	<ul style="list-style-type: none"> <li>Review forms of linear equations: slope-intercept, standard, and point-slope</li> <li>Review graphing lines with equations given in each form</li> <li>Review equations of horizontal and vertical lines</li> <li>Solve word problems and discuss the significance and meaning of the slope and y-intercept in the context of the problem</li> <li>Review relationship between slope and parallel/perpendicular lines</li> <li>Use relationships to determine whether lines are parallel, perpendicular, or neither</li> <li>Write equations of parallel and perpendicular lines</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Alternative assessments</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Graphic organizers</li> <li>Music or movement</li> <li>Simulations</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>Chapter 3 Test</li> </ul>	4 days

## Unit 4: Congruent Triangles

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-CO</b> Congruence <b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <ul style="list-style-type: none"> <li>• How do you identify corresponding parts of congruent triangles?</li> <li>• How do you show that two triangles are congruent?</li> <li>• How can you tell whether a triangle is isosceles or equilateral?</li> </ul>		<b>G-CO.10 Prove geometric theorems.</b> Prove theorems about triangles. <b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.3</b> Construct viable arguments and critique the reasoning of others. <b>SMP.8</b> Look for and express regularity in repeated reasoning.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 4.1</b> Recognize congruent figures and their corresponding parts.</p> <p><b>Obj. 4.2</b> Prove two triangles congruent using the SSS and SAS postulates</p> <p><b>Obj. 4.3</b> Prove two triangles congruent using the ASA postulate and AAS theorem.</p> <p><b>Obj. 4.6</b> Prove triangles congruent using the HL Theorem.</p> <p><b>Obj. 4.4</b> Use triangle congruence and CPCTC to prove that parts of two triangles are congruent.</p> <p><b>Obj. 4.5</b> Use and apply properties of isosceles triangles.</p>	<ul style="list-style-type: none"> <li>• Define congruent polygons, legs, base, vertex angle, base angles, corollary, hypotenuse, leg of a right triangle</li> <li>• Identify and name corresponding parts</li> <li>• Write congruence statements placing emphasis on the relationship of corresponding parts</li> <li>• Introduce congruency Theorem 4.1</li> <li>• Determine if two figures are congruent based on given information</li> <li>• Show video to illustrate real world application of congruent triangles (Pg. 217)</li> <li>• Have students complete Building Congruent Triangle Activity on Pg. 225</li> <li>• Introduce and illustrate the SSS, SAS, and ASA postulates, and the AAS and HL theorems</li> <li>• Stress writing plans for proofs and following correct two-column format</li> <li>• Show counterexample to “ASS”</li> <li>• Emphasize correct names of triangles in congruence statements</li> <li>• Emphasize the use of the step “definition of right triangle” in HL proofs</li> <li>• Discuss Sierpinski’s Triangle (Pg. 232)</li> <li>• Use the postulates to determine if two triangles are congruent, if so write the congruence statements</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Alternative assessments</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Graphic organizers</li> <li>• Color coding</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Games and puzzles</li> <li>• Small group instruction</li> <li>• Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Quiz 4.1-4.3</li> <li>• Quiz 4.2, 4.3, 4.6</li> <li>• Chapter 4 Test</li> </ul>	12 days

<p><b>Obj. 4.7</b> Identify congruent overlapping triangles. Prove two triangles congruent by first proving two other triangles congruent.</p>	<ul style="list-style-type: none"> <li>• Explain and emphasize that triangles must be first proven congruent in order to utilize CPCTC</li> <li>• Practice writing proofs as class, in groups/pairs, and individually</li> <li>• Have students complete paper-folding activity on Pg. 249 to demonstrate properties of equilateral and isosceles triangles</li> <li>• Demonstrate techniques for working with overlapping triangles (outline with colored chalk; separate triangles)</li> <li>• Use overlapping triangles in proofs</li> <li>• Challenge students to correctly rearrange proofs that have been written out of order</li> <li>• Continued emphasis on writing plans and marking diagrams before writing proofs</li> </ul> <p><b><u>Materials/Technology/Resources:</u></b> Protractors, Rulers, Calculators, Colored pencils, Colored Chalk, Triangle Graph Paper <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b> Engineering – Pg. 227 Problem 1</p>			
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## Unit 5: Relationships within Triangles

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-CO</b> Congruence <b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <b>G-C</b> Circles</p> <ul style="list-style-type: none"> <li>• How do you use coordinate geometry to find relationships within triangles?</li> <li>• How do you solve problems that involve measurements of triangles?</li> </ul>		<p><b>G-CO.9 Prove geometric theorems.</b> Prove theorems about lines and angles.  <b>G-CO.10 Prove geometric theorems.</b> Prove theorems about triangles.  <b>G-CO.11 Prove geometric theorems.</b> Prove theorems about parallelograms.  <b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.  <b>G-C.3 Understand and apply theorems about circles.</b> Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.  <b>SMP.4</b> Model with mathematics.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 5.1</b> Use properties of midsegments to solve problems.</p> <p><b>Obj. 5.2</b> Use properties of perpendicular bisectors and angle bisectors.</p> <p><b>Obj. 5.3</b> Identify properties of perpendicular bisectors and angle bisectors.</p> <p><b>Obj. 5.4</b> Identify properties of medians and altitudes of a triangle.</p> <p><b>Obj. 5.5</b> Use indirect reasoning to write proofs.</p> <p><b>Obj. 5.6</b> Use inequalities involving angles and sides of triangles.</p> <p><b>Obj. 5.7</b> Apply inequalities in two</p>	<ul style="list-style-type: none"> <li>• Complete Hands-On Activity: Midsegments of Triangles, introduce the Triangle Midsegment Thm. (Pg. 285)</li> <li>• Apply the Triangle Midsegment Thm to solve applicable problems</li> <li>• Introduce and illustrate theorems 5.2-5.12</li> <li>• Discuss determining the distance from a point to a line</li> <li>• Complete Paper-Folding Bisectors Activity (Pg. 300)</li> <li>• Complete two-column proofs using theorems</li> <li>• <b>Technology:</b> Computer activity to verify midsegment theorem as well as perpendicular bisector and angle bisector theorems</li> <li>• <b>Technology:</b> Computer activity to draw concurrent lines and investigate the effects of changing type of triangle (acute, right, obtuse)</li> <li>• Stress practice in sketching the concurrencies after computer investigations</li> <li>• Define and provide examples of key terms</li> <li>• Complete Paper-Folding Activity for medians and altitudes (Pg. 314)</li> <li>• Show video – Journey to the Center of a Triangle</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Open-ended questions</li> <li>• Exit prompts</li> <li>• Study Island assignments</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Quiz 5.1-5.4</li> <li>• Chapter 5 Test</li> </ul>	12 days

triangles.	<ul style="list-style-type: none"><li>• Use template for steps of indirect proof</li><li>• Discuss Comparison Property of Inequality</li><li>• Use straws or pipe cleaners to investigate triangle inequality</li><li>• <b>Technology:</b> Use computer software to measure sides and angles of a triangle verifying that the longest side is opposite the largest angle, etc</li><li>• Apply the swing ride to The Hinge Theorem (class trip to Great Adventure)</li></ul> <p><b><u>Materials/Technology/Resources:</u></b> Rulers, Calculators, Geometer's Sketchpad, Triangle Video, Straws, Pipe Cleaners <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b> Physics – Pg. 333 Problem 2</p>			
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## Unit 6: Polygons and Quadrilaterals

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <ul style="list-style-type: none"> <li>How can you find the sum of the measures of the polygon angles?</li> </ul>		<b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.7</b> Look for and make use of structure.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 6.1</b> Find the sums of the measures of the interior angles of a polygon. Find the sum of the measures of the exterior angles of a polygon.	<ul style="list-style-type: none"> <li>Introduce Polygon Angle-Sum Theorem using discovery activity, and use to solve for missing angles and variables in triangles</li> <li>Define exterior angle of a polygon</li> <li>Define various polygons: convex, concave, equilateral, equiangular, and regular polygon</li> </ul> <p><b>Materials/Technology/Resources:</b> Rulers, Protractors, Calculators, Geo-boards, Geometer's Sketchpad, Kites, Graph Paper <u>Geometry</u>. Pearson, 2012</p> <p><b>Interdisciplinary Connections:</b> My Math Video – Architecture Pg. 351</p>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Previewing materials</li> <li>Graphic organizers</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 6.1-6.3</li> </ul>	2 days

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-CO</b> Congruence <b>G-SRT</b> Similarity, Right Triangles, and Trigonometry  <ul style="list-style-type: none"> <li>How can you classify quadrilaterals?</li> </ul>		<b>G-CO.11 Prove geometric theorems.</b> Prove theorems about parallelograms. <b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.8</b> Look for and express regularity in repeated reasoning.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 6.2</b> Use relationships among sides and among angles of parallelograms. Use relationships involving diagonals of parallelograms or transversals.</p> <p><b>Obj. 6.3</b> Determine whether a quadrilateral is a parallelogram.</p> <p><b>Obj. 6.4</b> Define and classify special types of parallelograms. Use properties of diagonals of rhombuses and rectangles.</p> <p><b>Obj. 6.5</b> Determine whether a parallelogram is a rhombus or a rectangle.</p> <p><b>Obj. 6.6</b> Verify and use properties of trapezoids and kites.</p>	<ul style="list-style-type: none"> <li>Use definitions of special quadrilaterals and algebra to find lengths of sides and measures of angles</li> <li>Complete a Venn diagram or family tree to show relationships between special quadrilaterals</li> <li>Use Geo-boards to illustrate theorems involving parallelograms</li> <li>Introduce and illustrate theorems 6.1-6.17 and complete proofs.</li> <li>Solve problems using consecutive angles</li> <li>Complete proofs of select theorems (6.1-6.17)</li> <li>Apply theorems to solve for lengths of sides and measures of angles</li> <li>Assign practice proofs using various theorems throughout the chapter</li> <li>Complete examples proving that quadrilaterals are parallelograms</li> <li>Activity: Have students identify real-world objects that have one or more special quadrilaterals</li> <li><b>Technology:</b> Use Geometer's Sketchpad to illustrate different properties of special parallelograms</li> <li>Have students make and fly kites</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Previewing materials</li> <li>Graphic organizers</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 6.1-6.3</li> <li>Quiz 6.4-6.6</li> </ul> <p><b>Performance Assessment:</b></p> <ul style="list-style-type: none"> <li>Quadrilateral Family Project</li> </ul>	8 days



NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-SRT</b> Similarity, Right Triangles, and Trigonometry</p> <p><b>G-GPE</b> Expressing Geometric Properties with Equations</p> <ul style="list-style-type: none"> <li>How can you use coordinate geometry to prove general relationships?</li> </ul>		<p><b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures</p> <p><b>G-GPE.4 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to prove simple geometric theorems algebraically.</p> <p><b>G-GPE.7 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.  <b>SMP.2</b> Reason abstractly and quantitatively.  <b>SMP.6</b> Attend to precision.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 6.7</b> Classify polygons in the coordinate plane.</p> <p><b>Obj. 6.8</b> Name coordinates of special figures by using their properties.</p> <p><b>Obj. 6.9</b> Prove theorems using figures in the coordinate plane.</p>	<ul style="list-style-type: none"> <li>Complete examples of classifying quadrilaterals including in the coordinate plane</li> <li>Find missing numerical coordinates for quadrilaterals drawn on graph paper and substitute letters for numbers</li> <li>Use slope, distance, and midpoint formulas with literal coordinates</li> <li>Emphasize correct algebraic procedures</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Previewing materials</li> <li>Graphic organizers</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Chapter 6 Test</li> </ul>	4 days

## Unit 7: Similarity

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <b>G-GPE</b> Expressing Geometric Properties with Equations <ul style="list-style-type: none"> <li>• How do you use proportions to find side lengths and similar polygons?</li> <li>• How do you show two triangles are similar?</li> <li>• How to you identify corresponding parts of similar triangles?</li> </ul>		<b>G-SRT.4 Prove theorems involving similarity.</b> Prove theorems about triangles. <b>G-SRT.5 Prove theorems involving similarity.</b> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. <b>G-GPE.4 Use coordinates to prove simple geometric theorems algebraically.</b> Use coordinates to prove simple geometric theorems algebraically.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 7.1</b> Write ratios and solve proportions.  <b>Obj. 7.2</b> Identify and apply similar polygons.  <b>Obj. 7.3</b> Use AA, SAS, and SSS similarity statements. Use similarity to find indirect measurements.  <b>Obj. 7.4</b> Find and use relationships in similar right triangles.  <b>Obj. 7.5</b> Use the Side-Splitter Theorem. Use the Triangle-Angle-Bisector Theorem.	<ul style="list-style-type: none"> <li>• Define ratio, proportion, extended proportion, Cross-Product property, all properties of proportions, scale drawing, scale, similar, similarity ratio, golden rectangle, golden ratio, indirect measurement</li> <li>• Complete examples where students write ratios and solve proportions</li> <li>• Use supplemental materials where students learn how to find distance on a map using a scale</li> <li>• Identify corresponding parts of similar polygons</li> <li>• Solve for measures of angles and lengths of sides using properties of similar polygons</li> <li>• Determine if polygons are similar</li> <li>• Complete Activity: Triangles with Two Pairs of Congruent Angles, using precut pairs of similar triangles</li> <li>• Introduce and illustrate AA, SAS, and SSS similarity</li> <li>• Write similarity statements and similarity ratios given a diagram</li> <li>• Use theorems to determine if triangles are similar</li> <li>• Use similar figures to solve real-world problems</li> <li>• Concept Byte: Fractal Activity Pg. 448-449</li> <li>• Concept Byte: Golden Ratio Pg. 468</li> <li>• Show video – Donald Duck in Mathmagic Land</li> <li>• Apply theorems to solve for variables in similar figures</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Study Island assignments</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>• Quiz 7.1-7.3</li> <li>• Chapter 7 Test</li> </ul>	10 days

	<ul style="list-style-type: none"> <li>• Complete Radicals Review packet</li> <li>• Define geometric mean</li> <li>• Use index cards to create and demonstrate similarity in right triangles</li> <li>• Introduce and illustrate theorem 7.3 and its corollaries emphasizing the altitudes as the geometric means</li> <li>• Find geometric means of pairs of numbers</li> <li>• Use theorem 7.3 and its corollaries to solve various problems including problems that require the Pythagorean Theorem and factoring</li> <li>• Introduce and illustrate the Side-Splitter Theorem, its corollary, and the Triangle-Angle-Bisector Theorem</li> <li>• Complete exercises applying the Side-Splitter Theorem, its corollary, and the Triangle-Angle-Bisector Theorems</li> <li>• Algebraic applications to include solving quadratic equations</li> <li>• Examine and practice proofs throughout chapter (use supplemental materials)</li> </ul> <p><b><u>Materials/Technology/Resources:</u></b>  Index cards, Study Island, Radical Review Packet, Donald Duck in Mathmagic Land Video, Triangle Graph Paper, Rulers  <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b>  Geography – Pg. 446 Example 2</p>			
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**Unit 8: Right Triangles and Trigonometry**
**Grades: 9-10**
**Date: May 2012**

<b>NJ-CCSS Domain Essential Questions</b>		<b>NJ-CCSS Cluster. Standard Standards for Mathematical Practice</b>		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry  <ul style="list-style-type: none"> <li>How do you find a side length or angle measure in a right triangle?</li> </ul>		<b>G-SRT.4 Prove theorems involving similarity.</b> Prove theorems about triangles <b>G-SRT.7 Define trigonometric ratios and solve problems involving right triangles.</b> Explain and use the relationship between the sine and cosine of complementary angles. <b>G-SRT.8 Define trigonometric ratios and solve problems involving right triangles.</b> Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
<b>Skills/Objectives</b>  SWBAT...	<b>Instructional Strategies</b> Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	<b>Modifications</b> ESL / Special Education Academic Support/G&T Differentiated Instruction	<b>Assessments</b> Formative Summative Benchmarks	<b>Pacing</b>
<b>Obj. 8.1</b> Use the Pythagorean Theorem and its converse.  <b>Obj. 8.2</b> Use the properties of 45-45-90 and 30-60-90 triangles.	<ul style="list-style-type: none"> <li>Concept Byte: Pythagorean Theorem Pg. 490</li> <li>Introduce and illustrate theorems 8.1-8.6</li> <li>Define Pythagorean Triple</li> <li>Complete practice problems using the Pythagorean Theorem including real-world applications</li> <li>Find diagonal of rectangular prism</li> <li>Establish and emphasize patterns for special right triangles</li> <li>Give shortcuts for dividing by <math>\sqrt{2}</math> and <math>\sqrt{3}</math></li> <li>Solve for missing lengths of special right triangles</li> <li>Complete word problems using special right triangles</li> <li>Use special right triangles to solve for missing lengths in trapezoids</li> </ul> <p><b>Materials/Technology/Resources:</b>            Graph Paper, Rulers, Calculators, Trigonometric Table  <u>Geometry</u>. Pearson, 2012</p> <p><b>Interdisciplinary Connections:</b>            Home Maintenance – Pg. 496 #22            Farming – Pg. 504 #25</p>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Previewing materials</li> <li>Graphic organizers</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>Quiz 8.1-8.2</li> </ul>	3 days

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <b>G-MG</b> Modeling with Geometry <ul style="list-style-type: none"> <li>How do trigonometric ratios relate to similar right triangles?</li> </ul>		<b>G-SRT.7 Define trigonometric ratios and solve problems involving right triangles.</b> Explain and use the relationship between the sine and cosine of complementary angles. <b>G-SRT.8 Define trigonometric ratios and solve problems involving right triangles.</b> Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. <b>G-MG.1 Apply geometric concepts in modeling situations.</b> Use geometric shapes, their measures, and their properties to describe objects. <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 8.3</b> Use the sine cosine and tangent ratios to determine side lengths and angle measures in right triangles.  <b>Obj. 8.4</b> Use angles of elevation and depression to solve problems.	<ul style="list-style-type: none"> <li>Define sine, cosine, and tangent ratios (SOH CAH TOA)</li> <li>Complete examples where students must differentiate between solving for a missing side and a missing angle</li> <li>Stress correct key sequences for scientific and graphing calculators</li> <li>Give exact values for sine, cosine, and tangent for 30, 45, and 60 degrees</li> <li>Complete problems solving right triangles including word problems with real world applications</li> <li>Identify angles of elevation or depression in diagrams</li> <li>Solve word problems where students must draw and label a diagram, identify angles of elevation or depression, and correctly apply the appropriate trigonometric ratio</li> <li>Emphasize correct rounding</li> </ul>	<ul style="list-style-type: none"> <li>Extended time</li> <li>Assignment modification</li> <li>Group investigations</li> <li>Note taking guides</li> <li>Previewing materials</li> <li>Graphic organizers</li> <li>Highlighting/and underlining</li> <li>Manipulatives</li> <li>Stations/centers</li> <li>Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>In class practice problems</li> <li>Board work</li> <li>Do Now prompts</li> <li>Class work</li> <li>Homework</li> <li>Problem solving activities</li> <li>Think and Discuss</li> <li>Open-ended questions</li> <li>Exit prompts</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>Quiz 8.3-8.4</li> </ul> <b>Performance Assessment:</b> <ul style="list-style-type: none"> <li>Trigonometry Story Project</li> </ul>	4 days

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry  • How do trigonometric ratios relate to similar right triangles?		<b>G-SRT.7 Define trigonometric ratios and solve problems involving right triangles.</b> Explain and use the relationship between the sine and cosine of complementary angles. <b>G-SRT.8 Define trigonometric ratios and solve problems involving right triangles.</b> Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 8.5</b> Apply the Law of Sines.  <b>Obj. 8.6</b> Apply the Law of Cosines.	<ul style="list-style-type: none"> <li>• Guided Activity to explore the Law of Sines and Law of Cosines</li> <li>• Activate prior knowledge about right triangle trig to write an expression to describe for the area of the shaded region that uses a, b, and c</li> <li>• Think About a Plan: Guided Problem Solving</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Exit prompts</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>• Chapter 8 Test</li> </ul>	5 days

**Unit 9: Transformations**

**Grades: 9-10**

**Date: May 2012**

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-CO</b> Congruence</p> <ul style="list-style-type: none"> <li>• How can you change a figures position without changing its size and shape?</li> <li>• How can you represent a transformation in the coordinate plane?</li> <li>• How do you recognize congruence in figures?</li> </ul>		<p><b>G-CO.2 Experiment with transformations in the plane.</b> Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.</p> <p><b>G-CO.3 Experiment with transformations in the plane.</b> Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.</p> <p><b>G-CO.4 Experiment with transformations in the plane.</b> Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</p> <p><b>G-CO.5 Experiment with transformations in the plane.</b> Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using. Specify a sequence of transformations that will carry a given figure onto another.</p> <p><b>G-CO.6 Understand congruence in terms of rigid motions.</b> Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</p> <p><b>G-CO.7 Understand congruence in terms of rigid motions.</b> Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</p> <p><b>G-CO.8 Understand congruence in terms of rigid motions.</b> Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.</p>		
Skills/Objectives	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
SWBAT...				
<b>Obj. 9.1</b> Identify isometries. Find translation images of figures.	<ul style="list-style-type: none"> <li>• Define transformation, preimage, image, isometry, translation, composition, reflection, rotation, center of rotation, glide reflection, symmetry, reflectional symmetry, rotational symmetry, point symmetry, tessellation</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> </ul>	8 days

<p><b>Obj. 9.2</b> Find reflection images of figures.</p> <p><b>Obj. 9.3</b> Draw and identify rotation images of figures.</p> <p><b>Obj. 9.4</b> Find compositions of isometries including glide reflections. Classify isometries.</p> <p><b>Obj. 9.5</b> Identify congruence transformations. Prove triangle congruence using isometries.</p>	<ul style="list-style-type: none"> <li>• Identify if transformations are isometries</li> <li>• Differentiate between an image and a preimage, and name using corresponding parts</li> <li>• Complete examples applying different translations</li> <li>• Write a rule to describe a translation using ordered pair notation and vector notation</li> <li>• Discussion of vectors and matrices to be completed in Section 9.1 (using supplemental materials)</li> <li>• Use MIRAs to simulate reflections and compositions of reflections</li> <li>• Complete reflections in the coordinate plane over different types of lines of reflections (use coordinate plane whiteboards)</li> <li>• Develop “rules” for reflecting <math>(x, y)</math> in the <math>x</math>- and <math>y</math>-axes, in any vertical or horizontal line, and in the lines <math>y = x</math> and <math>y = -x</math></li> <li>• Complete examples of rotations in the coordinate plane (use coordinate plane whiteboards)</li> <li>• Develop “rules” for rotating <math>(x, y)</math> <math>90^\circ</math>, <math>180^\circ</math>, and <math>270^\circ</math></li> <li>• Find the equation for the line of reflection</li> <li>• Identify types of symmetry in objects by drawing the lines of symmetry or by finding the angle of rotation</li> <li>• Identify symmetries in everyday objects including car logos</li> <li>• Complete glide reflections in the coordinate plane</li> <li>• Complete examples of classifying isometries</li> <li>• Distinguish between odd and even isometries</li> <li>• Show video on creating a tessellation and have students create their own tessellation</li> </ul> <p><b><u>Materials/Technology/Resources:</u></b>  Geometer’s Sketchpad, MIRAs, Rulers, Graph Paper, Tessellation Video, White Boards, Calculators  <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b>  Ophthalmology – Getting Ready Pg. 587</p>	<ul style="list-style-type: none"> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<ul style="list-style-type: none"> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Exit prompts</li> </ul> <p><b><u>Summative:</u></b></p> <ul style="list-style-type: none"> <li>• Quiz 9.1-9.4</li> </ul> <p><b><u>Performance Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Kaleidoscope Activity</li> </ul>	
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NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <ul style="list-style-type: none"> <li>• How do you recognize similarity in figures?</li> <li>• How can you change a figures size without changing its shape?</li> </ul>		<b>G-SRT.2 Understand similarity in terms of similarity transformations.</b> Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. <b>G-SRT.3 Understand similarity in terms of similarity transformations.</b> Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.  <b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<b>Obj. 9.6</b> Understand dilation images of figures.  <b>Obj. 9.7</b> Identify similarity transformations and verify properties of similarity.	<ul style="list-style-type: none"> <li>• Define dilation, enlargement, reduction</li> <li>• Discuss if dilations are isometries as well as how dilations are present in the real-world (architecture, etc.)</li> <li>• Complete dilations centered at the origin in the coordinate plane using scalar multiplication (supplemental materials)</li> <li>• Identify the scale factor of a given dilation</li> <li>• Distinguish between positive and negative scale factors</li> <li>• Introduce and illustrate theorems</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Manipulatives</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<b>Formative:</b> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Exit prompts</li> </ul> <b>Summative:</b> <ul style="list-style-type: none"> <li>• Chapter 9 Test</li> </ul> <b>Performance Assessment:</b> <ul style="list-style-type: none"> <li>• Tessellation Project</li> </ul>	3 days

**Unit 10: Area**

**Grades: 9-10**

**Date: May 2012**

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-SRT</b> Similarity, Right Triangles, and Trigonometry <b>G-C</b> Circles</p> <ul style="list-style-type: none"> <li>• How do you find the area of a polygon or find the circumference and area of a circle?</li> <li>• How do perimeters and areas of similar polygons compare?</li> </ul>		<p><b>G-SRT.9 Apply trigonometry to general triangles.</b> Derive the formula <math>A = \frac{1}{2} ab \sin(C)</math> for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.</p> <p><b>G-C.5 Find arc lengths and areas of sectors of circles.</b> Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.4</b> Model with mathematics.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 10.1</b> Find the area of a parallelogram or a triangle.</p> <p><b>Obj. 10.2</b> Find the area of a trapezoid, rhombus, or kite.</p> <p><b>Obj. 10.3</b> Find the area of a regular polygon.</p> <p><b>Obj. 10.5</b> Find areas of regular polygons and triangles using trigonometry.</p> <p><b>Obj. 10.4</b> Find the perimeters and areas of similar figures.</p> <p><b>Obj. 10.6</b> Find the measures of central angles and arcs. To find the circumference and arc length.</p> <p><b>Obj. 10.7</b> Find the areas of circles,</p>	<ul style="list-style-type: none"> <li>• Review perimeter and area formulas for rectangles and squares</li> <li>• Include coordinate geometry and algebraic applications</li> <li>• Give formulas and situations for Heron’s formula and area of an equilateral triangle</li> <li>• Develop formula for area of a regular polygon from formula for triangle area</li> <li>• Emphasize applications given squares, equilateral triangles, and regular hexagons</li> <li>• State area of a square = <math>\frac{1}{2}d^2</math></li> <li>• Use trigonometry to find areas of any regular polygon given one measurement</li> <li>• Encourage rounding only at the end of the calculation</li> <li>• Discuss area of a triangle using <math>A = \frac{1}{2} ab \sin(C)</math> given SAS</li> <li>• Activity: Pg. 635 to develop the ratios of perimeters and ratios of areas of similar figures</li> <li>• Stress necessity for consistency in proportions</li> <li>• Emphasize correct vocabulary and notation for parts of a circle</li> <li>• Complete examples of finding the length of an arc and area of a sector of a circle</li> <li>• Relate formula for circle area to area of a regular polygon</li> </ul>	<ul style="list-style-type: none"> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Open-ended questions</li> <li>• Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Quiz 10.1-10.3, 10.5</li> <li>• Chapter 10 Test</li> </ul>	7 days

sectors, and segments of circles.	<ul style="list-style-type: none"><li>• Use real-world applications</li><li>• Complete complex area problems using sample HSPA problems</li></ul> <p><b><u>Materials/Technology/Resources:</u></b> Calculators, HSPA Reference Sheet, Chapter 10 Packet <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b> Urban Design – Pg. 620 #17</p>			
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**Unit 11: Surface Area and Volume**

**Grades: 9-10**

**Date: May 2012**

NJ-CCSS Domain Essential Questions	NJ-CCSS Cluster. Standard Standards for Mathematical Practice
<p><b>G-MG</b> Modeling with Geometry</p> <p><b>G-GMD</b> Geometric Measurement and Dimension</p> <ul style="list-style-type: none"> <li>• How can you determine the intersection between a solid and a plane?</li> <li>• How do you find the surface area of a solid?</li> </ul>	<p><b>G-GMD.1 Explain volume formulas and use them to solve problems.</b> Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.</p> <p><b>G-GMD.4 Visualize relationships between two-dimensional and three-dimensional objects.</b> Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects</p> <p><b>G-MG.1 Apply geometric concepts in modeling situations.</b> Use geometric shapes, their measures, and their properties to describe objects</p> <p><b>G-MG.2 Apply geometric concepts in modeling situations.</b> Apply concepts of density based on area and volume in modeling situations</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.4</b> Model with mathematics</p> <p><b>SMP.7</b> Look for and make use of structure.</p>

Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 11.1</b> Recognize polyhedral and their parts. Visualize cross sections of space figures.</p> <p><b>Obj. 11.2</b> Find the surface area of a prism and cylinder.</p> <p><b>Obj. 11.3</b> Find the surface area of a pyramid and cone.</p>	<ul style="list-style-type: none"> <li>• Students will work independently on surface area and volume packet</li> <li>• Use the relationship between similarity ratio, area ratio, and volume ratio to find missing quantities and solve word problems</li> <li>• Identify the number of vertices, edges, and faces of polyhedral</li> <li>• Introduce and apply Euler’s Formula</li> <li>• Describe a cross section</li> <li>• Include extension on “Perspective Drawing” Pg. 696-697</li> <li>• Stress that surface area can be calculated with or without formulas</li> <li>• Activity: Take apart a net to demonstrate surface area</li> <li>• Introduce and illustrate theorems 11.1-11.4</li> <li>• Complete examples finding various surface areas</li> <li>• Use theorems 11.3 and 11.4 to find lateral areas and surface areas of pyramids and cones</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Daily record-keeping assistance</li> <li>• Previewing materials</li> <li>• KWL strategies</li> <li>• Graphic organizers</li> <li>• Cue cards</li> <li>• Manipulatives</li> <li>• Simulations</li> <li>• Stations/centers</li> <li>• Small group instruction</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Open-ended questions</li> <li>• Study Island assignments</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Surface Area and Volume Packet</li> </ul>	3 days

	<p><b><u>Materials/Technology/Resources:</u></b> Nets, Plastic Models, Calculators, Surface Area and Volume Packet <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b> • Containers – Pg. 745 Problem 4</p>			
<p><b>NJ-CCSS Domain Essential Questions</b></p>		<p><b>NJ-CCSS Cluster. Standard Standards for Mathematical Practice</b></p>		
<p><b>G-MG</b> Modeling with Geometry <b>G-GMD</b> Geometric Measurement and Dimension</p> <ul style="list-style-type: none"> <li>• How do the surface area and volume of similar solids compare?</li> <li>• How do you find the volume of a solid?</li> </ul>	<p><b>G-GMD.1 Explain volume formulas and use them to solve problems.</b> Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.</p> <p><b>G-GMD.3 Explain volume formulas and use them to solve problems.</b> Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.</p> <p><b>G-GMD.4 Visualize relationships between two-dimensional and three-dimensional objects.</b> Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.</p> <p><b>G-MG.1 Apply geometric concepts in modeling situations.</b> Use geometric shapes, their measures, and their properties to describe objects.</p> <p><b>G-MG.2 Apply geometric concepts in modeling situations.</b> Apply concepts of density based on area and volume in modeling situations.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.4</b> Model with mathematics.</p> <p><b>SMP.7</b> Look for and make use of structure.</p>			
<p><b>Skills/Objectives</b>  SWBAT...</p>	<p><b>Instructional Strategies</b> Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity</p>	<p><b>Modifications</b> ESL / Special Education Academic Support/G&amp;T Differentiated Instruction</p>	<p><b>Assessments</b> Formative Summative Benchmarks</p>	<p><b>Pacing</b></p>
<p><b>Obj. 11.6</b> Find the surface area and volume of a sphere.</p> <p><b>Obj. 11.4</b> Find the volume of a prism and cylinder.</p>	<ul style="list-style-type: none"> <li>• Hands-On Activity: Finding Volume Pg. 728</li> <li>• Use theorems 11.6-11.7 to find volumes of prisms and cylinders</li> <li>• Use theorems 11.8 and 11.9 to find volumes of pyramids and cones</li> <li>• Stress the pairing of prisms and cylinders; of pyramids and cones</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Daily record-keeping assistance</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> </ul>	<p>3 days</p>

<p><b>Obj. 11.5</b> Find the volume of a pyramid and cone.</p> <p><b>Obj. 11.7</b> Compare and find the areas and volumes of similar solids.</p>	<ul style="list-style-type: none"> <li>• Use models to demonstrate that the pyramid has volume = <math>\frac{1}{3}</math> of prism with the same base area and height</li> <li>• Include composite figures</li> <li>• Solve word problems with real-world applications</li> <li>• Use theorem 11.11 to find the volume of any sphere</li> <li>• Review previously-stated relationships for 2-D figures</li> <li>• Extend to 3-D figures emphasizing the difference among similarity ratio, area ratio, and volume ratio</li> <li>• Stress consistency in proportions</li> <li>• Use tables such as the one shown on Pg. 748 to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>• Previewing materials</li> <li>• KWL strategies</li> <li>• Graphic organizers</li> <li>• Cue cards</li> <li>• Manipulatives</li> <li>• Simulations</li> <li>• Stations/centers</li> <li>• Small group instruction</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Open-ended questions</li> <li>• Exit prompts</li> <li>• Study Island assignments</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Surface Area and Volume Packet</li> <li>• Chapter 11 Test</li> </ul>	
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**Unit 12: Circles**

**Grades: 9-10**

**Date: May 2012**

NJ-CCSS Domain Essential Questions		NJ-CCSS Cluster. Standard Standards for Mathematical Practice		
<p><b>G-C</b> Circles <b>G-GPE</b> Expressing Geometric Properties with Equations</p> <ul style="list-style-type: none"> <li>• How can you prove relationships between angles and arcs in a circle?</li> <li>• When lines intersect a circle or within a circle how do you find the measures of resulting angles, arcs, and segments?</li> <li>• How do you find the equation of a circle in the coordinate plane?</li> </ul>		<p><b>G-C.2 Understand and apply theorems about circles</b>, Identify and describe relationships among inscribed angles, radii, and chords.</p> <p><b>G-C.3 Understand and apply theorems about circles</b>. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p><b>G-C.4 Understand and apply theorems about circles</b>. (+) Construct a tangent line from a point outside a given circle to the circle.</p> <p><b>G-GPE.1 Translate between the geometric description and the equation for a conic section</b>. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them. <b>SMP.8</b> Look for and express regularity in repeated reasoning.</p>		
Skills/Objectives  SWBAT...	Instructional Strategies Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	Modifications ESL / Special Education Academic Support/G&T Differentiated Instruction	Assessments Formative Summative Benchmarks	Pacing
<p><b>Obj. 12.1</b> Use properties of a tangent to a circle.</p> <p><b>Obj. 12.2</b> Use congruent chords, arcs, and central angles. To use perpendicular bisectors to chords.</p> <p><b>Obj. 12.3</b> Find the measure of an inscribed angle. Find the measure of an angle formed by a tangent and a chord.</p> <p><b>Obj. 12.4</b> Find measures of angles formed by chords, secants, and tangents. Find the lengths of segments associated with circles.</p>	<ul style="list-style-type: none"> <li>• Define locus, tangent to a circle, point of tangency, inscribed, circumscribed, chord, inscribed angle, intercepted arc, secant</li> <li>• Review and apply Pythagorean Theorem, special right triangles</li> <li>• Include applications involving “foil”</li> <li>• Introduce and illustrate theorems 12.1-12.3</li> <li>• Additional material on common tangents and tangent circles</li> <li>• Complete problems applying theorems of circles</li> <li>• Include algebraic and proof applications</li> <li>• Complete proof of theorem 12.5</li> <li>• Use theorems 12.4 to 12.8 to find missing variables in circles</li> <li>• Use theorems to find intercepted arcs, inscribed angles, and inscribed polygons</li> <li>• Stress correct position of intercepted arc(s)</li> <li>• Determine which special quadrilaterals can be inscribed in a circle</li> <li>• Justify corollaries on Pg. 782</li> <li>• Summarize all formulas and distribute summary sheets for angle measures</li> </ul>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Assignment modification</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• Previewing materials</li> <li>• Graphic organizers</li> <li>• Highlighting/and underlining</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<p><b>Formative:</b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Exit prompts</li> </ul> <p><b>Summative:</b></p> <ul style="list-style-type: none"> <li>• Quiz 12.1-12.3</li> <li>• Chapter 12 Test</li> </ul>	10 days

<p><b>Obj. 12.5</b> Write the equation of a circle. Find the center and radius of a circle.</p> <p><b>Obj. 12.6</b> Draw and describe a locus.</p>	<ul style="list-style-type: none"> <li>• Review distance and midpoint formulas</li> <li>• Write the equation of a circle given the center and the radius</li> <li>• Graph a circle given its equation</li> <li>• Write the equation of a circle given the center and a point on the circle</li> <li>• Draw and describe various loci</li> <li>• Emphasize the need to identify loci as 2-D or 3-D</li> </ul> <p><b><u>Materials/Technology/Resources:</u></b> Calculators, Rulers <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b> Archeology – Pg. 775 Problem 3</p>			
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## Unit 13: Probability

Grades: 9-10Date: May 2012

NJ-CCSS Domain Essential Questions	NJ-CCSS Cluster.Standard Standards for Mathematical Practice
<p><b>S-CP</b> Conditional Probability and the Rules of Probability</p> <p><b>S-MD</b> Using Probability to Make Decisions</p> <ul style="list-style-type: none"> <li>• What is the difference between experimental probability and theoretical probability?</li> <li>• What is a frequency table?</li> <li>• What does it mean for an event to be random?</li> </ul>	<p><b>C-CP.1 Understand independence and conditional probability and use them to interpret data.</b> Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).</p> <p><b>C-CP.2 Understand independence and conditional probability and use them to interpret data.</b> Understand that two events <math>A</math> and <math>B</math> are independent if the probability of <math>A</math> and <math>B</math> occurring together is the product of their probabilities, and use this characterization to determine if they are independent.</p> <p><b>C-CP.3 Understand independence and conditional probability and use them to interpret data.</b> Understand the conditional probability of <math>A</math> given <math>B</math> as <math>P(A \text{ and } B)/P(B)</math>, and interpret independence of <math>A</math> and <math>B</math> as saying that the conditional probability of <math>A</math> given <math>B</math> is the same as the probability of <math>A</math>, and the conditional probability of <math>B</math> given <math>A</math> is the same as the probability of <math>B</math>.</p> <p><b>C-CP.4 Understand independence and conditional probability and use them to interpret data.</b> Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.</p> <p><b>C-CP.5 Understand independence and conditional probability and use them to interpret data.</b> Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.</p> <p><b>C-CP.6 Use the rules of probability to compute probabilities of compound events in a uniform probability model.</b> Find the conditional probability of <math>A</math> given <math>B</math> as the fraction of <math>B</math>'s outcomes that also belong to <math>A</math>, and interpret the answer in terms of the model.</p> <p><b>C-CP.7 Use the rules of probability to compute probabilities of compound events in a uniform probability model.</b> Apply the Addition Rule, <math>P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)</math>, and interpret the answer in terms of the model.</p> <p><b>C-CP.8 Use the rules of probability to compute probabilities of compound events in a uniform probability model.</b> Apply the general Multiplication Rule in a uniform probability model, <math>P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)</math>, and interpret the answer in terms of the model.</p> <p><b>C-CP.9 Use the rules of probability to compute probabilities of compound events in a uniform probability model.</b> Use permutations and combinations to compute probabilities of compound events and solve problems.</p> <p><b>S-MD.6 Use probability to evaluate outcomes of decisions.</b> Use probabilities to make fair decisions.</p> <p><b>S-MD.7 Use probability to evaluate outcomes of decisions.</b> Analyze decisions and strategies using probability concepts</p> <p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.6</b> Attend to precision.</p>

<b>Skills/Objectives</b>  SWBAT...	<b>Instructional Strategies</b> Activities/ Materials /Technology Interdisciplinary Connections Cultural Diversity	<b>Modifications</b> ESL / Special Education Academic Support/G&T Differentiated Instruction	<b>Assessments</b> Formative Summative Benchmarks	<b>Pacing</b>
<p><b>Obj. 13.1</b> Calculate experimental and theoretical probability.</p> <p><b>Obj. 10.8</b> Use segment and area models to find the probabilities of events.</p> <p><b>Obj. 13.2</b> Make and use frequency tables and probability distributions.</p> <p><b>Obj. 13.3</b> Use permutations and combinations to solve problems.</p> <p><b>Obj. 13.4</b> Identify and independent and independent events. Find compound probabilities.</p> <p><b>Obj. 13.5</b> Construct and use probability models.</p> <p><b>Obj. 13.6</b> Understand and calculate conditional probabilities</p> <p><b>Obj. 13.7</b> Understand random numbers. Use probabilities in decision making.</p>	<ul style="list-style-type: none"> <li>• Define outcome, event, sample space, experimental , theoretical , geometric probability, permutation, combination, independent, dependent, mutually exclusive</li> <li>• Complete dice activity to compare theoretical and experimental probability</li> <li>• Use a bullseye to calculate geometric probability</li> <li>• Applications include number lines, areas of shaded figures comprised of circles, triangles, squares</li> <li>• Use color cubes in paper bags to discover the difference between independent and dependent events</li> <li>• Use counting principle to find the number of possible outcomes</li> <li>• Distinguish between mutually exclusive and non-mutually exclusive events</li> </ul> <p><b><u>Materials/Technology/Resources:</u></b>            Calculators, Dice, Bullseye, Spinners, Study Island  <u>Geometry</u>. Pearson, 2012</p> <p><b><u>Interdisciplinary Connections:</u></b>            Home Economics – Pg. 837 Problem 1</p>	<ul style="list-style-type: none"> <li>• Extended time</li> <li>• Group investigations</li> <li>• Note taking guides</li> <li>• KWL strategies</li> <li>• Color coding</li> <li>• Manipulatives</li> <li>• Simulations</li> <li>• Games and puzzles</li> <li>• Stations/centers</li> <li>• Pair-share</li> </ul>	<p><b><u>Formative:</u></b></p> <ul style="list-style-type: none"> <li>• In class practice problems</li> <li>• Board work</li> <li>• Do Now prompts</li> <li>• Class work</li> <li>• Homework</li> <li>• Problem solving activities</li> <li>• Think and Discuss</li> <li>• Open-ended questions</li> <li>• Exit prompts</li> <li>• Study Island assignments</li> </ul> <p><b><u>Summative:</u></b></p> <ul style="list-style-type: none"> <li>• Quiz 13.1-13.4 and 10.8</li> <li>• Chapter 13 Test</li> </ul> <p><b><u>Performance Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Student created survey</li> </ul>	10 days

## NORTH BRUNSWICK TOWNSHIP HIGH SCHOOL

**(2135) Honors Geometry**

Grades 9, 10

5 credits - 1 year

Pre-requisite: Honors Algebra I

**Course Description:**

*Honors Geometry* has a three-fold approach using deductive reasoning, transformations and coordinate geometry to apply postulates, definitions and theorems. Students will explore the properties of triangles and quadrilaterals. Other units include circles, polygons, area and volume, introductory trigonometry and probability. Students will be expected to have fluency in algebra skills to meet the demands of this rigorous course. A scientific calculator or better is required. Students must complete a summer assignment.

**Proficiencies:**

At the completion of the course the student should be able to:

- Experiment with transformations in the plane.
- Understand congruence in terms of rigid motions.
- Prove geometric theorems.
- Make geometric constructions.
- Understand similarity in terms of similarity transformations.
- Prove theorems involving similarity.
- Define trigonometric ratios and solve problems involving right triangles.
- Apply trigonometry to general triangles.
- Understand and apply theorems about circles.
- Find arc lengths and areas of sectors of circles.
- Translate between the geometric description and the equation for a conic section.
- Use coordinates to prove simple geometric theorems algebraically.
- Explain volume formulas and use them to solve problems.
- Visualize relationships between two-dimensional and three-dimensional objects.
- Apply geometric concepts in modeling situations.
- Understand independence and conditional probability and use them to interpret data.
- Use the rules of probability to compute probabilities of compound events in a uniform probability model.
- Use probability to evaluate outcomes of decisions.

**Course Requirements:**

- Students will be expected to maintain a high level of participation and preparedness, including bringing textbooks and other necessary tools to class daily.
- Students will be expected to attend class regularly.
- Students will be expected to complete all assignments.
- Students will be expected to successfully accomplish all graded work including tests, quizzes, and class projects.
- Students will be cooperative in class and contribute to the growth of the class.

**Evaluation Procedures:**

Marking period grades will be determined by:

Performance Assessments	90%
Homework	5%
Classwork	5%