OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT

Content Area: Mathematics

Course Title: Geometry	**Grade Level: 10**

Unit Plan 1 **Introducing Geometry/Definitions (Ch. 1)**	**Pacing Guide** **1 – 2 weeks**
Unit Plan 2 **Tools of Geometry/Geometric Art** **(Ch. 0 & 3)**	**Pacing Guide** **2 – 3 weeks**
Unit Plan 3 **Patterns and Linear data** **(Sections 2.1 – 2.4)**	**Pacing Guide** **3 – 4 weeks**
Unit Plan 4 **Angle Relationships and Triangle Properties/Proofs** **(Sections 2.4, 2.5 and Ch. 4)**	**Pacing Guide** **4 – 5 weeks**
Unit Plan 5 **Polygon Properties (Ch. 5)**	**Pacing Guide** **2 – 3 weeks**
Unit Plan 6 **Properties of Circles (Ch. 6)**	**Pacing Guide** **2 – 3 weeks**

Unit Plan 7 **Transformations and Tessellations (Ch. 7)**	**Pacing Guide** **1 – 2 Weeks**
Unit Plan 8 **Area (Ch. 8)**	**Pacing Guide** **2 – 3 Weeks**
Unit Plan 9 **The Pythagorean Theorem and Right Triangle Trig. (Ch. 9 and 12)**	**Pacing Guide** **3 – 4 Weeks**
Unit Plan 10 **Volume (Ch. 10)**	**Pacing Guide** **3 – 4 Weeks**
Unit Plan 11 **Similarity (Ch. 11)**	**Pacing Guide** **2 – 3 Weeks**

Date Created: **February 2012**

Board Approved on: **March 14, 2012**

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Introducing Geometry/Definitions (Ch. 1)

Target Course/Grade Level: Geometry / 10

Unit Summary
Recognize, draw and communicate geometric shapes in 2 and 3 dimensions

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards
Congruence
1. Experiment with transformations in the plane
1. 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.

Unit Essential Questions	**Unit Enduring Understandings**
• What is geometry? • What are the building blocks of geometry? • What are the characteristics of geometric shapes associated with second and third dimension? • How do you communicate what you have observed utilizing inductive reasoning?	*Students will understand that…* • Name, define, draw/sketch, label, and measure two and three dimensional shapes. • Utilize drawing as a problem solving approach. • The components of a good definition.
Unit Objectives *Students will know…* • Recognize basis characteristics of geometric shapes. • Draw two and three dimensional shapes. • Communicate mathematically through observation.	**Unit Objectives** *Students will be able to…* • Recognize, draw and communicate geometric shapes in two and three dimensions.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
For additional ideas please refer to NJ State DOE classroom application documents:
http://www.corestandards.org/resources

- Observation
- Homework
- Class participation
- Do-Now
- Notebook

Summative Assessments
For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
http://www.state.nj.us/education/cccs

- Chapter/Unit Test
- Quizzes
- Presentations
- Unit Projects
- Quarterlies and Final Exams

Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook (Discovering Geometry – An Investigative Approach)
- Geometry Sketchpad
- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATH CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Tools of Geometry/Geometric Art (Ch. 0 & 3)

Target Course/Grade Level: Geometry / 10

Unit Summary
Study geometric art forms of culture around the world and in nature. Develop skills using a compass, a straight edge, patty paper and geometry software.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Congruence:

1. **Experiment with transformations in the plane**
   3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
2. **Make geometric constructions**
   12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*
   13. Construct an equilateral triangle, a square and a regular hexagon inscribed in a circle.

Unit Essential Questions	**Unit Enduring Understandings**
• How do constructions differ from sketches and drawings? • What are the 5 geometric constructions and how are they used to construct other shapes? • What is the significance of each point of concurrency? • How are geometric tools used in other disciplines?	*Students will understand that…* • Five constructions and their applications. • Four points of concurrency and their significance. • To reinforce the concepts learned in Unit I.
Unit Objectives *Students will know…* • To construct the five basic constructions using compass, straightedge and/or patty paper. • Use constructions to observe angle bisectors, perpendicular bisectors, medians, and altitudes.	**Unit Objectives** *Students will be able to…* • Begin to write conjectures based on observations of geometric shapes. • Reinforce definitions from previous unit.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
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Summative Assessments
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- Chapter/Unit Test
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Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
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- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Patterns and Linear Data (Sections 2.1 – 2.4)

Target Course/Grade Level: Geometry / 10

Unit Summary
Use inductive reasoning to discover patterns. Use patterns to enforce the concepts of graphing, writing equations of lines and scatter plots learned in Algebra 1.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
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Learning Targets

Content Standards

Expressing Geometric Properties with Equations

1. Use coordinates to prove simple geometric theorems algebraically

4. Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point(1, √3) lies on the circle centered at the origin and containing the point (0, 2).*
5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

Unit Essential Questions	**Unit Enduring Understandings**
• How do we use graphing to help visualize number patterns? • What equations can be used to represent patterns observed from graphing? • What are the significance of slope and the Y intercept in expressing a number pattern? • What are the connection between the geometry terms learned in previous units and the algebra learned in this unit?	*Students will understand that…* • Linear and quadratic patterns. • Write equations in slope intercept form. • Slopes of parallel and perpendicular lines. • Coordinate geometry.
Unit Objectives *Students will know…* • Identify linear and quadratic patterns. • Define parallel and perpendicular slopes and special quadrilaterals. • Write equations for patterns and lines in coordinate geometry. • Calculate point of intersection algebraically and graphically.	**Unit Objectives** *Students will be able to…* • Reinforce algebra skills and relate them to geometry.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

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Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Angle Relationships and Triangle Properties/Proofs (Sections 2.4, 2.5 and Ch. 4)

Target Course/Grade Level: Geometry / 10

Unit Summary
Angle relationships (vertical angles, linear pairs), special angles associated with parallel lines, relationship between sides and angles of triangles and proving two triangles are congruent using two column or flow chart proofs.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Congruence

1. Understand congruence in terms of rigid motions

6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a rigid motion on a figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
8. Explain how the criteria for triangle congruence (ASA, SAS, AAS and SSS) follow from the definition of congruence.

2. Prove geometric theorems

9. Prove theorems about lines and angles.
Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*

3. Similarity, Right Triangles, and Trigonometry

5. Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

Unit Essential Questions • What are the special angles associated with parallel lines? • What are the significant properties associated with triangles? • What are the methods used to determine that two triangles are congruent? • How do you use logical reasoning to support a conjecture?	**Unit Enduring Understandings** *Students will understand that…* • Triangle congruency. • Forms of Proof. • Properties of Triangles and parallel lines.
Unit Objectives *Students will know…* • How to organize logically in the form of a proof. • How to identify when not enough information is provided. • How to reinforce concepts of congruency.	**Unit Objectives** *Students will be able to…* • Understand the important characteristics of a triangle in geometry. • Develop reasoning skills.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
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- Observation
- Homework
- Class participation
- Do-Now
- Notebook

Summative Assessments
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- Chapter/Unit Test
- Quizzes
- Presentations
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- Quarterlies and Final Exams

Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook (Discovering Geometry – An Investigative Approach)
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- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Polygon Properties (Ch. 5)

Target Course/Grade Level: Geometry / 10

Unit Summary
Properties of polygons, discover relationships among angles, sides and diagonals of polygons and learn real-world applications of special polygons.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Congruence

1. Prove geometric theorems:

9. Prove theorems about lines and angles.
   Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
11. Prove theorems about parallelograms.
   Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other and conversely, rectangle are parallelograms with congruent diagonals.

Unit Essential Questions • What are the many properties of polygons? • What are their real world applications?	**Unit Enduring Understandings** *Students will understand that…* • Interior and exterior angle sums of any polygon. • Angle and diagonals of polygons. • Properties of kites and trapezoids. • Properties of mid segments in triangles and trapezoids. • Properties of special quadrilaterals and the real world applications they possess.
Unit Objectives *Students will know…* • Reinforce characteristics of polygons from Unit 1. • Relationship among angles, sides and diagonals of polygons.	**Unit Objectives** *Students will be able to…* • Reinforce patterns and algebra skills from Unit 3. • Learn about real world applications of special polygons.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

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Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Properties of Circles (Ch. 6)

Target Course/Grade Level: Geometry / 10

Unit Summary
Discover relationships among chords, arcs and angles, properties of tangent lines and how to calculate the length of an arc.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Circles
1. Understand and apply theorems about circles
1. Prove that all circles are similar.
2. Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*
3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
4. Construct a tangent line from a point outside a given circle to the circle.

2. Find arc lengths and areas of sectors of circles
5. 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.

Unit Essential Questions	**Unit Enduring Understandings**
• What are the properties of circles and the relationships among angles, lines and line segments in and around circles? • What is the relationship between the circumference and the diameter of a circle?	*Students will understand that…* • Identify and define characteristics of circles and angles, lines and line segments associated with circles. • Discovery of pi. • Use of drawing as a problem solving approach to problems associated with circles. • Discover arc length.
Unit Objectives *Students will know…* • Identify Characteristics of circles. • Algebra skills for problem solving. • Construction.	**Unit Objectives** *Students will be able to…* • To recognize properties associated with circles. • Understand the origin of pi. • Reinforce construction skills. • Reinforce algebra and problem solving skills.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
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- Observation
- Homework
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- Notebook

Summative Assessments
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- Chapter/Unit Test
- Quizzes
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Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook (Discovering Geometry – An Investigative Approach)
- Geometry Sketchpad
- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Transformations and Tessellations (Ch. 7)

Target Course/Grade Level: Geometry / 10

Unit Summary
Discover some basic properties of transformations and symmetry.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Congruence

1. Experiment with transformations in the plane

2. Model 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 (e.g., translation versus stretch in a specific direction).
3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
4. Develop definitions of rotations, reflections and translations in terms of angles, circles, perpendicular lines, parallel lines and line segments.
5. Given a specified rotation, reflection or translation and a geometric figure, construct the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Construct a sequence of transformations that will carry a given figure onto another.

2. **Understand congruence in terms of rigid motions**

6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a rigid motion on a figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

Unit Essential Questions	**Unit Enduring Understandings**
• What are some basic properties of transformations and symmetry? • What are some techniques used to create an original design?	*Students will understand that…* • Three types of isometries (transformations). • Symmetry. • Tessellations using the three isometries. • Algebra component, shift of graphs and reflections with graphs.
Unit Objectives *Students will know…* • Drawing tessellations. • Use of tools. • Differentiate between types of tessellations. • Graphing calculators.	**Unit Objectives** *Students will be able to…* • Reinforce use of geometric tools. • Reinforce use of geometry in art (ch. 0).

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
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- Observation
- Homework
- Class participation
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- Notebook

Summative Assessments
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- Chapter/Unit Test
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Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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- Geometry Sketchpad
- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Area (Ch. 8)

Target Course/Grade Level: Geometry / 10

Unit Summary
Discover area formulas for rectangles, parallelograms, triangles, trapezoids, kites, regular polygons, circles and other shapes. Learn how to find the surface area of prisms, pyramids, cylinders and cones.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Geometric Measurement and Dimension

1. Find arc lengths and areas of sectors of circles

5. 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; and derive the formula for the area of a sector.

Unit Essential Questions	**Unit Enduring Understandings**
• How do we determine the area of any plane figure? • How is area utilized in distinguishing between 3-dimensional figures?	*Students will understand that…* • Area of figure in units. • Area of all quadrilaterals. • Area of triangles. • Area of regular polygons. • Area of circles and their sections. • Surface area.
Unit Objectives *Students will know…* • Review identification of figures from Chapter 2. • Identify the appropriate formula and utilize to solve area problems. • Calculate area of regions. • Calculate the surface area using either a direct formula or by calculating surface areas of each face and adding. • Calculate area in real life problems.	**Unit Objectives** *Students will be able to…* • Recognize the basic properties of area and identify how figures differ in calculating area. Students will then use these properties to determine area of real problems.

OCEAN COUNTY MATHEMATICS CURRICULUM
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Evidence of Learning

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Modifications (ELLs, Special Education, Gifted and Talented)

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Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

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Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: The Pythagorean Theorem and Right Triangle Trig (Ch. 9 and 12)

Target Course/Grade Level: Geometry / 10

Unit Summary
Discover the Pythagorean theorem and use it to calculate the distance between two points and problem solving. Basic introduction to right triangle trigonometry.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
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Learning Targets

Content Standards

Similarity, Right Triangles and Trigonometry

Define trigonometric ratios and solve problems involving right triangles

6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
7. Explain and use the relationship between the sine and cosine of complementary angles.
8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Unit Essential Questions	**Unit Enduring Understandings**
• How can we measure the distance between any two points by utilizing horizontal and vertical change? • How can we use distance to determine perpendicular lines? • How can we measure the distance between two points in coordinate geometry? • What is the relationship between sides of a right triangle?	*Students will understand that…* • Pythagorean Theorem and its converse including special right triangles. • Distance formula in coordinate geometry. • Trigonometry ratios.
Unit Objectives *Students will know…* • How to find missing side of a right triangle. • How to determine right triangles. • How to determining side length of special right triangles. • How to use Pythagorean triples. • How to determine distance between points in coordinate geometry. • How to determine trigonometric ratios, and use these ratios to calculate side length, etc.	**Unit Objectives** *Students will be able to…* • Understand the relationships between sides of right triangles and utilize these relationships to determine side and angle measure.

OCEAN COUNTY MATHEMATICS CURRICULUM
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Evidence of Learning

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- Class participation
- DO-NOW
- Notebook

Summative Assessments
For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
http://www.state.nj.us/education/cccs/

- Chapter/Unit Test
- Quizzes
- Presentations
- Unit Projects
- Quarterlies and Final Exams

Modifications (ELLs, Special Education, Gifted and Talented)

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Native language texts and native language to English dictionary
- Follow all IEP modifications/504 plan

Curriculum Development Resources/Instructional Materials/Equipment Needed Teacher Resources:

- Textbook (Discovering Geometry – An Investigative Approach)
- Geometry Sketchpad
- HSPA Mathematics Workbooks

Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Volume (Ch. 10)

Target Course/Grade Level: Geometry / 10

Unit Summary
Explore and define many three-dimensional solids, discover volume formulas for prisms, pyramids, cylinders, cones and spheres and surface area of a sphere.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
For further clarification refer to NJ Class Standard Introductions at
http://www.corestandards.org/the-standards/mathematics/high-school-geometry/introduction/

Learning Targets

Content Standards

Geometric Measurements and Dimensions
1. Explain volume formulas and use them to solve problems
1. Give an informal argument for the formulas for the volume of a cylinder, pyramid, and cone.
2. Use volume formulas for cylinders, pyramids, cones and spheres to solve problems.

2.Visualize relationships between two-dimensional and three-dimensional objects
4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Modeling with Geometry
1. Apply geometric concepts in modeling situations
1. Use geometric shapes, their measures and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder)
2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

Unit Essential Questions	**Unit Enduring Understandings**
• What makes a three-dimensional figure a polyhedron? • Where do figures differ in regard to calculating volume? • How does volume relate to density? • How do we calculate volume using only displacement?	*Students will understand that…* • Categories of three-dimensional figures. • Calculating volumes of polyhedrons, spheres, and sections of spheres. • Calculating surface area of a sphere.
Unit Objectives *Students will know…* • Classifying three-dimension figures. • Identify parts of three-dimensional figures. • Calculate volume of a prism and cylinder. • Calculate volume of a pyramid and cone. • Calculate volume based upon displacement. • Calculate volume of a sphere. • Calculate surface area of a sphere.	**Unit Objectives** *Students will be able to…* • Students should understand the meaning of space in three dimensions and calculate ht volume using a formula. Students should also understand the significance of volume in terms of its mass, density, and displacement.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

Formative Assessments
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- Observation
- Homework
- Class participation
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Teacher Notes:

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Unit Overview

Content Area: Mathematics

Unit Title: Similarity (Ch. 11)

Target Course/Grade Level: Geometry / 10

Unit Summary
Review ratio and proportion, define similar polygons, discover short cuts for similar triangles and discover the relationship about area and volume of similar polygons and solids.

Primary interdisciplinary connections:
Infused within the unit are connection to the 2009 NJCCCS for Mathematics, Language Arts Literacy and Technology.

21st century themes:
The unit will integrate the 21st Century Life and Career stand 9.1 strands A-D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, and cross cultural understanding and interpersonal communication.

Technology connections:
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Learning Targets

Content Standards

Congruence

1.Experiment with transformations in the plane

2. Model 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 (e.g., translation versus stretch in a specific direction).

5. Given a specified rotation, reflection or translation and a geometric figure, construct the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Construct a sequence of transformations that will carry a given figure onto another.

Similarity, Right Triangles and Trigonometry

1.Understand similarity in terms of similarity transformations

1b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

2. 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 pairs of angles and the proportionality of all pairs of sides.

3. Use the properties of similarity transformations to establish the AA criterion for similarity of triangles.

2. Prove theorems involving similarity

4. Prove theorems about triangles using similarity transformations. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean theorem proved using triangle similarity.*

5. Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

Unit Essential Questions	**Unit Enduring Understandings**
• When do figures have identical shapes? • What properties of a figure change when we shrink of expand a figure? • What is the relationship in space of similar figures?	*Students will understand that…* • Ratios and proportions. • Similar polygons. • Similar triangles. • Indirect measurements. • Area and volume of similar figures.
Unit Objectives *Students will know…* • Simplify ratios. • Solve proportions. • Determining side measurements of similar figures. • Determine area and volume of similar figures.	**Unit Objectives** *Students will be able to…* • To see beyond congruence and see the common features of similar figure; also, they should see the impact on these features by shrinking and expanding the figure.

OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT
Evidence of Learning

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Teacher Notes: