

**OCEAN COUNTY MATHEMATICS CURRICULUM
SOUTHERN REGIONAL SCHOOL DISTRICT**

Content Area: Mathematics

Course Title: Geometry Honors

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) and Introduction to
Integration (Area under the curve)

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: **March 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 Honors / 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>

Learning Targets

Content Standards

- G-CO.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.*
- G-GPE.6** *Find the point on a directed line segment between two given points that partitions the segment in a given ratio.*

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Name, define, draw/sketch, label, and measure two and three dimensional shapes. • Utilize drawing as a problem solving approach • The characteristics of a good definition, including classifying and differentiating the figure.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • Recognize basis characteristics of geometric shapes. • Draw two and three dimensional shapes. • Communicate mathematically through observation. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Recognize, draw and communicate geometric shapes in two and three dimensions. • Classify triangles by both their angle measurements and side lengths • Calculate the midpoint and endpoint of a segment on the coordinate plane using the coordinate midpoint formula. • Classify polygons using terms such as <i>concave</i>, <i>convex</i>, <i>equilateral</i>, <i>equiangular</i>, and <i>regular</i>.

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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):

<http://www.corestandards.org/the-standards/mathematics>

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

Target Course/Grade Level: Geometry Honors / 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>

Learning Targets

Content Standards

- G-CO.3.** *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.*
- G-CO.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.*
- G-CO.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.*
- G-CO.13** *Construct an equilateral triangle, a square and a regular hexagon inscribed in a circle.*

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Five constructions and their applications. • Four points of concurrency and their significance. • To reinforce the concepts learned in Unit I. • Conjectures outlining the special characteristics of certain constructions. • Points of concurrency in a triangle can model real world situations.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • How to construct the five basic constructions using compass, straightedge and/or patty paper. • How to use constructions to observe angle bisectors, perpendicular bisectors, medians, and altitudes. • The 4 points of concurrency and the special characteristics that differentiate them from each other. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Begin to write conjectures based on observations of geometric shapes. • Reinforce definitions from previous unit. • Utilize the properties of constructions (<i>perpendicular bisector is equidistant from the endpoints, angle bisector is equidistant from the sides of an angle, the perpendicular is the shortest distance from a point to a line</i>) for problem solving and real world problem solving. • Use computer software to carry out constructions, especially with points of concurrency. • Use the properties of points of concurrency to solve real world problems.

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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):

<http://www.corestandards.org/the-standards/mathematics>

- 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: Patterns and Linear Data (Sections 2.1 – 2.4)

Target Course/Grade Level: Geometry Honors / 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:

For further clarification refer to NJ Class Standard Introductions at:

<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

- G-GPE.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 $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.*
- G-GPE.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).
- F-LE.2.** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Linear and quadratic patterns. • Write equations in slope intercept form. • Slopes of parallel and perpendicular lines. • Coordinate geometry.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • 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. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Use inductive reasoning to predict future values of number patterns and shape patterns. • Use deductive reasoning to determine conclusions without physical models. • Use algebra skills to determine the rate of change and starting value for a linear function. • Use diagonals and sides of a polygon to model real world situations in which every item has a direct relationship with every other item.

**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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

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

Target Course/Grade Level: Geometry Honors / 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>

Learning Targets

Content Standards

- G-CO.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.
- G-CO.8.** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence.
- G-CO.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.*
- G-CO.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.*
- G-SRT.5** Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • There are specific relationships between angles created by intersecting lines, especially when the lines are parallel. • Proofs are used to justify statements of congruence and other properties of definitions. • There is a direct relationship between the angles of a triangle and their sum. • There are other properties of isosceles triangles that go beyond its sides being congruent. • There are several inequality relationships in a triangle that are used to list relationships in sides and angles of a triangle.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • 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. • How to compare sides and angles of a triangle based upon the other. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Understand the important characteristics of a triangle in geometry. • Develop reasoning skills. • Find the missing angle of a triangle. • Utilize properties of a triangle (congruent base angles, altitude as median and vertex angle bisector) to solve problems. • List the sides or angles of a triangle in increasing or decreasing order based upon the other's measurements. • Create a compound inequality that represents the possible sides of a triangle based upon its other two sides. • Define an exterior angle and utilize its measure to find missing interior angles of a triangle.

**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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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: Polygon Properties (Ch. 5)

Target Course/Grade Level: Geometry Honors / 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>

Learning Targets

Content Standards

- G-CO.3.** *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.*
- G-CO.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, rectangles are parallelograms with congruent diagonals.*
- G-GPE.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).

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • What are the many properties of polygons? • What are their real world applications? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • 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.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • Reinforce characteristics of polygons from Unit 1. • Relationship among angles, sides and diagonals of polygons. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Reinforce patterns and algebra skills from Unit 3. • Learn about real world applications of special polygons. • Find the missing interior and exterior angle of a polygon based upon their sum. • Find the individual interior angle measure of a polygon that is equiangular. • Use the properties of midsegments to find missing side lengths, angle measures, and perimeter measures. • Find side lengths and angle measures based upon the properties of parallelograms.

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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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: Properties of Circles (Ch. 6)

Target Course/Grade Level: Geometry Honors / 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>

Learning Targets

Content Standards

G-C.1. Prove that all circles are similar.

G-C.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.*

G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

G-C.4. (+) Construct a tangent line from a point outside a given circle to the circle.

G-C.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.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • There exists many connections between chord lengths, tangent lines, arc measures, central angles, and inscribed angles. • Pi was discovered as a ratio between circle measures. • Use of drawing as a problem solving approach to problems associated with circles. • Discover arc length.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • Angle, chord, and tangent characteristics found in circles. • Algebra skills for problem solving. • Construction. • The real world significance of circumference and arc length. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Recognize properties associated with circles. • Understand the origin of pi. • Reinforce construction skills. • Reinforce algebra and problem solving skills. • Find missing angle and segment measures based upon the properties of circles. • Find the circumference in a circle, and use circumference to find other measures(radius, diameter, arc length) within a circle. • Find the speed and number of revolutions that occur when an object travels in circular motion.

**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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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: Transformations and Tessellations (Ch. 7)

Target Course/Grade Level: Geometry Honors / 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>

Learning Targets

Content Standards

- G-CO.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).
- G-CO.3** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
- G-CO.4** Develop definitions of rotations, reflections and translations in terms of angles, circles, perpendicular lines, parallel lines and line segments.
- G-CO.5.** Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using e.g. graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure into another.
- G-CO.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.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • What are some basic properties of transformations and symmetry? • What are some techniques used to create an original design? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Isometries exist that preserve congruent figures • Symmetry can be described in multiple ways. • Tessellations exist using the three isometries. • Ordered pair rules can be used to describe these transformations and composite transformations.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • The types of isometries and their compositions. • The ordered pair rules associated with isometries and their compositions. • Tessellations and how to identify how they were created. • Use of tools. • Differentiate between types of tessellations. • Graphing calculators. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Identify an isometry and which kind was used in a figure. • The properties of composite transformations. • Find an ordered pair rule for a given drawing on the coordinate plane that describes a transformation. • Identify a tessellation by the vertices of its figures. • Create a tessellation with their own shape using translations or rotations.

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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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: Area (Ch. 8) and Introduction to Integration (Area under the curve)

Target Course/Grade Level: Geometry Honors / 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. Introduce integrals as area under the curve using geometric shapes.

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>

Learning Targets

Content Standards

G-C.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.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • How do we determine the area of any plane figure? • How is area utilized in distinguishing between 3-dimensional figures? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • The measurements used to calculate area of a figure often are perpendicular • The area of irregular figures can often be found using the formulas of regular figures and dividing it up. • The area formulas for more complex figures is developed from rectangles. • There is a connection between area of regular polygons and circles. • Surface area is the sum of the areas of all its plane figures.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • What measurements are used in calculating area and how to identify them in a figure. • How to solve real world problems using these area formulas. • How the shapes affect maximum and minimum areas of figures (both quadrilaterals and circles). 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • 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
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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

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

Target Course/Grade Level: Geometry Honors / 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:

For further clarification refer to NJ Class Standard Introductions at:
<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

- G-SRT.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.
- G-SRT.7** Explain and use the relationship between the sine and cosine of complementary angles.
- G-SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Pythagorean theorem and its converse including special right triangles can be used to classify triangles and find side measurements, as well as to determine if 2 lines are perpendicular • The distance formula in coordinate geometry can be used as an application of Pythagorean Theorem. • Trigonometry ratios represent relationships between sides and angles in all right triangles.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • 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. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Use Pythagorean theorem to find missing sides of a triangle. • Simplify radicals, including rationalizing a denominator. • Use the converse of Pythagorean theorem to classify triangles by its angles. • Use special right triangles to find two missing sides of a triangle, as well as coordinates on the unit circle. • Use the distance formula to find the distance between points in coordinate geometry. • Find the equation of a circle in _____ form on the coordinate plane. • Apply Pythagorean theorem to area problems in order to find missing 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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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 Honors / 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>

Learning Targets

Content Standards

- G-GMD.1.** Give an informal argument for the formulas for the volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*
- G-GMD.2** (+) Given an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.
- G-GMD.3** Use volume formulas for cylinders, pyramids, cones and spheres to solve problems.
- G-GMD.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.
- G-MG.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)
- G-MG.2.** Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • 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? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Different characteristics create different categories of solids, and that these characteristics create different formulas for three-dimensional figures. • There is a direct connection between the base area of many solids and its volume. • Density is a measure that allows us to relate mass and volume of a figure.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • How to classify three-dimensional figures. • How to identify parts of three-dimensional figures. • The development of formulas for finding the volume of figures with constant width and non-constant width, along with spheres. • How to calculate volume of irregular figures based upon displacement. • How to use displacement to determine what type of material a solid is made of. • Calculate surface area of a sphere. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Classify solids as polyhedrons, and then classify polyhedrons based upon their bases and lateral surfaces. • Utilize Euler's formula to find the vertices, faces, and edges of a polyhedron. • Find the volume of prisms, pyramids, and spheres. • Use displacement to find the volume of irregular figures. • Determine the density of a figure given its mass and volume. • Use density to determine what type of material it is.

**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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):

<http://www.corestandards.org/the-standards/mathematics>

- 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: Similarity (Ch. 11)

Target Course/Grade Level: Geometry Honors / 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:

For further clarification refer to NJ Class Standard Introductions at:
<http://www.corestandards.org/the-standards/mathematics>

Learning Targets

Content Standards

- G-CO.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).
- G-CO.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.
- G-SRT.1** The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- G-SRT.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.
- G-SRT.3.** Use the properties of similarity transformations to establish the AA criterion for similarity of triangles.
- G-SRT.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.*
- G-SRT.5.** Use triangle congruence and similarity criteria to solve problems and to prove relationships in geometric figures.

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • When do figures have identical shapes? • What properties of a figure change when we shrink or expand a figure? • What is the relationship in space of similar figures? 	<p>Unit Enduring Understandings</p> <p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Ratios and proportions are used to find side lengths in similar polygons. • Conjectures can be used to justify similar triangles. • Lengths and heights not able to be found using standard measuring tools can often be found using indirect measurements. • Similar figures have relationships not only with linear measurements but with area and volume as well.
<p>Unit Objectives</p> <p><i>Students will know...</i></p> <ul style="list-style-type: none"> • The necessity of simplifying ratios and solving proportions. • How to find side measurements of similar figures. • Techniques used to determine area and volume of similar figures. • How indirect measurement can be used to solve real world problems. 	<p>Unit Objectives</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> • Define similar figures and determine if two figures are indeed similar. • Find angle measurements and side lengths of similar figures. • Use indirect measurement to find lengths of figures in the real world. • Use the scale factor between sides of similar figures to find areas and volumes of the same similar figures.

**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/the-standards/mathematics>

- Observation
- Homework
- Class participation
- DO-NOW
- Notebook

Summative Assessments

For additional ideas please refer to NJ State DOE Professional Education Port (PEP):
<http://www.corestandards.org/the-standards/mathematics>

- 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: