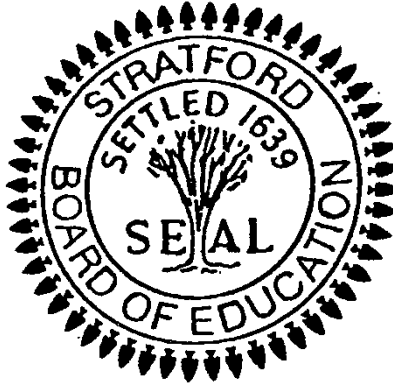


STRATFORD PUBLIC SCHOOLS

Stratford, Connecticut



“Tantum eruditi sunt liberi”
Only The Educated Are Free

Integrated Math Curriculum

Adopted by the Board of Education on June 2013

Janet Robinson
Superintendent

Elaine Watson
Assistant Superintendent

DISTRICT MISSION

The mission of the Stratford Public Schools is to develop a community of learners in which students acquire the knowledge, skills and confidence to meet the challenges of a changing and increasingly diverse 21st century society.

DISTRICT CORE VALUES

Students will acquire content knowledge, strengthen higher-order thinking, and develop character in order to address 21st century challenges.

BUNNELL HIGH SCHOOL BELIEFS

We believe teachers must work collaboratively in support of student learning and to model collaboration as a social skill with students. We believe that a rigorous curriculum for all students, an acceptance of diversity, and a culture that actively welcomes all learners will contribute to a more knowledgeable community and society. We believe in the value of a strong education as a means of preparing students for work and life in the remainder of the 21st century.

STRATFORD HIGH SCHOOL BELIEFS

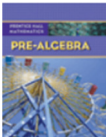
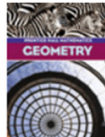
- a safe, positive school climate that embraces diversity is essential to ensure respect and opportunity for each individual
- students should understand the world beyond their community in order to contribute to a global society
- parents and students must share responsibility and work in partnership with the school in order to improve academic performance and to develop lifelong learners
- students should use technology effectively to acquire, process, and deliver information

BUNNELL HIGH SCHOOL and STRATFORD HIGH SCHOOL LEARNING EXPECTATIONS

All students will...

- use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks. (Academic)
- work independently and collaboratively to solve problems and accomplish goals. (Civic-Social)
- communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. (Academic)
- demonstrate innovation, flexibility and adaptability in thinking patterns, work habits and working/learning conditions. (Academic)
- effectively apply the analysis, synthesis and evaluation processes that enable productive problem solving. (Academic)
- value and demonstrate personal responsibility, character, cultural understanding and ethical behavior. (Civic-Social)
- show competence in all core academic subjects and other fields of interest, including the ability to clearly and effectively communicate content information in multiple formats. (Academic)

INTEGRATED MATH PACING GUIDE

Unit Name and Synopsis	Projected # Instructional Days	Curriculum and Unit Design
<p align="center"><u>Unit 1</u></p> <p><u>Spatial thinking</u> solidifies students' previous work with geometric exploration. Students develop rigorous definitions of three familiar congruence transformations: reflections, translations and rotations. Students use these transformations to discover and prove geometric properties. Throughout the course, students will use transformations as a tool to analyze and describe relationships between geometric figures as well as linear functions with respect to Parent Functions.</p>	<p align="center">30 days</p>	<p>Prentice Hall Pre-Algebra Chapter 9 Graphic Organizer</p> <p>Prentice Hall Pre-Algebra Chapter 9-1 Introduction to Geometry: Points, Lines and Planes</p> <p>Prentice Hall Pre-Algebra Chapter 9-8 Translations: Dilations in the coordinate plane</p> <p>Prentice Hall Geometry Chapter 12-2 Translations</p> <p>Prentice Hall Pre-Algebra Chapter 9-9 Symmetry and Reflections</p> <p>Prentice Hall Geometry Chapter 12-1 Reflections</p> <p>Prentice Hall Pre-Algebra Chapter 9-10 Rotations</p> <p>Prentice Hall Geometry Chapter 12-3 Rotations</p> <div style="display: flex; justify-content: center; gap: 10px;">   </div> <p>Extension: Tessellations PBA Activity Labs: Dilations</p>
<p align="center"><u>Unit 2</u></p> <p><u>Exponents</u></p>	<p align="center">25 days</p>	<p>Eureka http://commoncore.org/maps/math/home Prentice Hall Pre-Algebra</p>
<p align="center"><u>Unit 3</u></p> <p><u>Similarity</u></p>	<p align="center">25 days</p>	<p>Prentice Hall Pre-Algebra Eureka NCTM Illuminations</p>
<p align="center"><u>Unit 4</u></p> <p><u>Linear, Midpoint, Distance formula, Slope</u></p>	<p align="center">30 days</p>	
<p align="center"><u>Unit 5</u></p> <p><u>Pythagorean Theorem</u></p>	<p align="center">20 days</p>	

<p style="text-align: center;"><u>Unit 6</u></p> <p><u>Geometric Modeling in 2D and 3D with Surface Area, Volume</u> explores three-dimensional geometry including representations of real-world situations with three-dimensional objects and calculating volume. Students make connections between two-dimensional and three-dimensional representations of objects. This course culminates with modeling problems involving three-dimensional objects, allowing students to integrate their knowledge and apply complex geometric reasoning to real-life problems. This unit provides an opportunity to bring together all of the relationships students have learned in this unit and apply them to real-world situations. The focus is on in-depth problems that require students to draw on their understanding of geometric figures and strategically use the tools that have been developing throughout the units.</p>	30 days	

Integrated Math Sequenced Units for the Common Core State Standard in Mathematics

Unit 1: Transformations	Suggested number of instructional days: 30 days
<p>This unit solidifies students' previous work with geometric exploration. Students develop rigorous definitions of three familiar congruence transformations: reflections, translations and rotations. Students use these transformations to discover and prove geometric properties. Throughout the course, students will use transformations as a tool to analyze and describe relationships between geometric figures.</p>	
STUDENT LEARNING GOALS	

CCSS Math Standards

Congruence G-CO

[CCSS.Math.Content.8.G.A.1](#)

Verify experimentally the properties of rotations, reflections, and translations:

[CCSS.Math.Content.8.G.A.1.a](#)

Lines are taken to lines, and line segments to line segments of the same length.

[CCSS.Math.Content.8.G.A.1.b](#)

Angles are taken to angles of the same measure.

[CCSS.Math.Content.8.G.A.1.c](#)

Parallel lines are taken to parallel lines.

[CCSS.Math.Content.8.G.A.2](#)

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

[CCSS.Math.Content.8.G.A.3](#)

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

[CCSS.Math.Content.8.G.A.4](#)

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

Experiment with transformations in the plane

G-CO. 1 Link: [CCSS.Math.Content.HSG-CO.A.1](#)

G-CO. 2 Link: [CCSS.Math.Content.HSG-CO.A.2](#)

G-CO. 3 Link: [CCSS.Math.Content.HSG-CO.A.3](#)

G-CO. 4 Link: [CCSS.Math.Content.HSG-CO.A.4](#)

G-CO. 5 Link: [CCSS.Math.Content.HSG-CO.A.5](#)

21st Century Skills and Expectations

Rubric: Critical Skills

1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.
2. Work independently and collaboratively to solve problems and accomplish goals.
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.
5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.
6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.

<p><u>Math Practices</u> <u>CCSS.Math.Practice.MP1</u> Make sense of problems and persevere in solving them. <u>CCSS.Math.Practice.MP2</u> Reason abstractly and quantitatively. <u>CCSS.Math.Practice.MP3</u> Construct viable arguments and critique the reasoning of others. <u>CCSS.Math.Practice.MP4</u> Model with mathematics. <u>CCSS.Math.Practice.MP5</u> Use appropriate tools strategically. <u>CCSS.Math.Practice.MP6</u> Attend to precision. <u>CCSS.Math.Practice.MP7</u> Look for and make use of structure. <u>CCSS.Math.Practice.MP8</u> Look for and express regularity in repeated reasoning.</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
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<p>Enduring Understandings</p> <p>Students will develop rigorous definitions of transformations and will discover and prove geometric properties among reflections, translations and rotations. Understand that a two-dimensional figure is both similar and congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations.</p>	<p>Essential Questions</p> <ul style="list-style-type: none"> • When are translations necessary within a school day? • How can translations affect a photograph? • What connections exist between transformations and dilations? • How are congruence and similarity connected? • How are transformations used in real world settings?
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<p>Key Vocabulary</p> <ul style="list-style-type: none"> • Angle of Rotation: The amount of rotation (in degrees) of a figure about a fixed point such as the origin. • Image: The result of a transformation. • Intersection: The point at which two or more lines intersect or cross. • Isometry: a distance preserving map of a geometric figure to another location using a reflection, rotation or translation indicates an isometry of the figure M to a new location M'. M and M' remain congruent. • Line: One of the undefined terms of geometry that represents an infinite set of points with no thickness and its length continues in two opposite directions indefinitely indicates a line that passes through points A and B. • Line segment: A part of a line between two points on the line indicates the line segment between points A and B. • Parallel lines: Two lines are parallel if they lie in the same plane and do not intersect indicates that line AB is parallel to line CD. • Perpendicular lines: Two lines are perpendicular if they intersect to form right angles indicates that line AB is perpendicular to line CD. • Point: One of the basic undefined terms of geometry that represents a location. A dot is used to symbolize it and it is thought of as having no length, width or thickness. • Pre-image: A figure before a transformation has taken place.

- **Ray:** A part of a line that begins at a point and continues forever in one direction indicates a ray that begins at point A and continues in the direction of point B indefinitely.
- **Reflection:** A transformation of a figure that creates a mirror image, “flips,” over a line.
- **Reflection Line (or line of reflection):** A line that acts as a mirror so that corresponding points are the same distance from the mirror.
- **Rotation:** A transformation that turns a figure about a fixed point through a given angle and a given direction, such as 90° clockwise.
- **Segment:** See line segment.
- **Transformation:** The mapping, or movement, of all points of a figure in a plane according to a common operation, such as translation, reflection or rotation.
- **Translation:** A transformation that slides each point of a figure the same distance in the same direction.
- **Vertex:** The location at which two lines, line segments or rays intersect.

Learning Objectives / Grade Level Expectations***

Students will:

- *Verify and prove the properties of transformations.*
- *Develop definitions of similarity in terms of transformations.*
- *Understand congruence in terms of rigid motion.*
- *Describe and compare function transformations on a set of points, including translations and horizontal or vertical stretching.*
- *Represent and compare rigid and size transformations of figures in a coordinate plane using.*

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning

PBA: Activity Lab: Transformations

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

Unit 1: 30 Days

Daily Note taking Worksheets used where needed. ☺

Prentice Hall Pre-Algebra Chapter 9-1

Introduction to Geometry: Points, Lines and Planes: Pages 462 - 466

Prentice Hall Pre-Algebra Chapter 9-8

Translations: Dilations in the coordinate plane: Pages 501 - 505

Prentice Hall Geometry Chapter 12-2

Translations: Pages 643 - 644

Prentice Hall Pre-Algebra Chapter 9-9

Symmetry and Reflection: Pages 507 - 509

Prentice Hall Geometry Chapter 12-1

Reflections: Page 12-1

Prentice Hall Pre-Algebra Chapter 9-10

Rotations: Pages 511 - 514

Prentice Hall Geometry Chapter 12-3

Rotations: Investigation Page 647

Supplemental Materials

SMARTBoard Exchange Transformation (*See links*)
<http://exchange.smarttech.com>
 Software – Reflection APPS



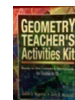
Illuminations- NCTM

<http://illuminations.nctm.org>

Symmetries and Rotations 1 - III
 Transformations and Frieze Patterns (C)

Suggested Homework and Practice

Reteach 9-1 Points lines and Planes
Reteach 9-8
Reteach 9-8
Reteach 9-10
Practice 9-1
Practice 9-8
Practice 9-10
 Pearson CC worksheets



Geometry Teachers Activities Kit Transformations
 Pages 189 – 195 (TD)

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccsmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/commmon-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <http://commoncoresheets.com/>

• [Transformations: Types of Transformations](#) [SMART Notebook lesson]

• [Transformations of Polygons](#) [SMART Notebook lesson]

• [Properties of Transformations: Rotation](#)[SMART Notebook lesson]

• [Properties of Transformations: Reflection](#)[SMART Notebook lesson]

• [Transformations of Polygons in the Coordinate Plane](#) [SMART Notebook lesson]

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Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 2: Exponents	Suggested number of instructional days: 15 days
<p>This unit demonstrates that a two-dimensional figure is similar to another if the second can be obtained from a dilation followed by congruence. Knowledge of basic rigid motions is reinforced throughout the module, specifically when students describe the sequence that exhibits a similarity between two given figures. In Unit 1, students used vectors to describe the translation of the plane. Figures are bound to the coordinate plane, students will describe translations in terms of units left or right and/or units up or down. When figures on the coordinate plane are rotated, the center of rotation is the origin of the graph.</p>	

STUDENT LEARNING GOALS

CCSS Math Standards

[CCSS.Math.Content.8.EE.A.1](#)
[CCSS.Math.Content.8.EE.A.2](#)
[CCSS.Math.Content.8.EE.A.3](#)
[CCSS.Math.Content.8.EE.A.4](#)
[CCSS.Math.Content.8.EE.A.1](#)

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

[CCSS.Math.Content.8.EE.A.2](#)

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

[CCSS.Math.Content.8.EE.A.3](#)

Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. **For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9 , and determine that the world population is more than 20 times larger.**

[CCSS.Math.Content.8.EE.A.4](#)

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology

21st Century Skills and Expectations

Rubric: Critical Skills

1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.
2. Work independently and collaboratively to solve problems and accomplish goals.
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.
5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.
6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.

Math Practices

[CCSS.Math.Practice.MP1](#)

Make sense of problems and persevere in solving them.

[CCSS.Math.Practice.MP2](#)

Reason abstractly and quantitatively.

[CCSS.Math.Practice.MP3](#)

Construct viable arguments and critique the reasoning of others.

[CCSS.Math.Practice.MP4](#)

Model with mathematics.

[CCSS.Math.Practice.MP5](#)

Use appropriate tools strategically.

[CCSS.Math.Practice.MP6](#)

Attend to precision.

[CCSS.Math.Practice.MP7](#)

Look for and make use of structure.

[CCSS.Math.Practice.MP8](#)

Look for and express regularity in repeated reasoning.

Interdisciplinary Standards (Technology Integration)

Standard 1: Information Strategies

Students determine their need for information and apply strategies to select, locate, and access information resources.

Standard 2: Information Use

Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.

Standard 3: Information and Technology Application

Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.

Standard 4: Literacy and Literary Appreciation

Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.

Standard 5: Personal Management

Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.

Enduring Understandings

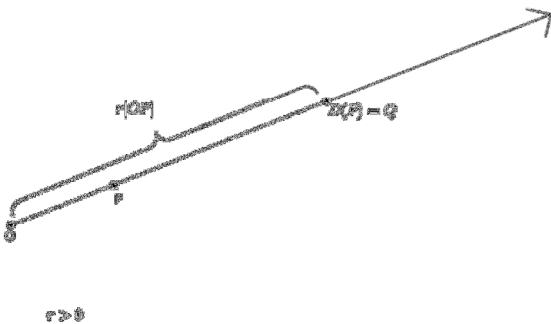
It should be noted that congruence, together with similarity, is *the* fundamental concept in planar geometry. It is a concept defined without coordinates. In fact, it is most transparently understood when introduced without the extra conceptual baggage of a coordinate system. This is partly because a coordinate system picks out a preferred point (the origin), which then centers most discussions of rotations, reflections, and translations at or in reference to that point. These discussions are further restricted to rotations, reflections, or translations that are easy to do in a coordinate plane.

Essential Questions

- How are the definitions?
- How
- Why are

Key Vocabulary

Dilation (Dilation, DD , is a transformation of the plane with center O and scale factor r ($r > 0$) if $f(O) = O$ and if $P \neq O$, then the point $D(P)$, to be denoted by Q , is the point on the ray OP so that $|OQ| = r|OP|$. A dilation in the coordinate plane is a transformation that shrinks or magnifies a figure by multiplying each coordinate of the figure by the scale factor.



Congruence (A finite composition of basic rigid motions—reflections, rotations, translations—of the plane. Two figures in a plane are *congruent* if there is a congruence that maps one figure onto the other figure.)

Similar (Two figures in the plane are similar if there exists a similarity transformation taking one figure to the other.)

Similarity Transformation (A *similarity transformation*, or *similarity*, is a composition of a finite number of basic rigid motions or dilations. The *scale factor* of a similarity transformation is the product of the scale factors of the dilations in the composition; if there are no dilations in the composition, the scale factor is defined to be 1.)

Similarity (A similarity is an example of a transformation.)

Learning Objectives / Grade Level Expectations

Students will:

- Experiment with transformations in the plane
- Prove geometric theorems about lines and angles
- Use coordinates to prove simple geometric theorems
- Verify experimentally with dilations in the coordinate plane to develop the definition of similarity.
- Use the properties of similarity transformations to develop the criteria for proving similar triangles.
- Use descriptions of rigid motion and transformed geometric figures to predict the effects rigid motion has on figures in the coordinate plane.
- Use the definition of congruence, based on rigid motion, to show two triangles are congruent if and only if their corresponding sides and corresponding angles are congruent.

- Apply the definition of congruence, based on rigid motion, to develop and explain the triangle congruence criteria; ASA, SSS, and SAS.

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning

**PBA 1
Points Lines and Planes**

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

Unit 2: Days

Eureka Math Unit Exponents



Supplemental Materials

Lesson 1: Exponential Notation

Classwork

5^6 means $5 \times 5 \times 5 \times 5 \times 5 \times 5$ and $(\frac{2}{3})^4$ means $\frac{2}{3} \times \frac{2}{3} \times \frac{2}{3} \times \frac{2}{3}$

You have seen this kind of notation before, it is called **exponential notation**. In general, for any number x and any positive integer n ,

$$x^n = \underbrace{(x \cdot x \cdot \dots \cdot x)}_{n \text{ times}}$$

The number x^n is called x raised to the n -th power, n is the **exponent** of x in x^n , and x is the **base** of x^n .

Pearson: Exponents, Multiplication and Division

Suggested Homework and Practice

Eureka PDF worksheets

Reteach and Practice Worksheet

Pearson Common Core Practice

PBA 1

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccssmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>

Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 3: Similarity	Suggested number of instructional days: 15 days
<p>This unit explores basic theorems and conjectures about triangles, including the triangle inequality conjecture, the Triangle Sum Theorem, and theorems regarding centers of a triangle. Students have previously explored some of these relationships but will build on this with deductive reasoning and proofs related to triangles. Students make and verify conjectures related to isosceles triangles and explore physical properties of the centroid of a triangle. Basic construction techniques will be used to explore properties of triangles. Attention to precise definitions throughout this, and previous units, will be continued.</p>	
STUDENT LEARNING GOALS	
<p><u>CCSS Math Standards</u> <u>CCSS.Math.Content.8.G.A.4</u> Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p> <p>Congruence G-CO <u>Prove geometric theorems</u> G-CO. 10 Link: <u>CCSS.Math.Content.HSG-CO.C.10</u> <u>Make geometric constructions</u> G-CO. 12 Link: <u>CCSS.Math.Content.HSG-CO.D.12</u> G-CO. 13 Link: <u>CCSS.Math.Content.HSG-CO.D.13</u></p> <p>Circles G-C <u>Understand and apply theorems about circles</u> G-C. 3 Link: <u>CCSS.Math.Content.HSG-C.A.3</u></p> <p>Modeling with geometry – G-MG <u>Apply geometric concepts in modeling situations</u> G-MG .1 Link: <u>CCSS.Math.Content.HSG-MG.A.1</u></p>	<p><u>21st Century Skills and Expectations</u> <u>Rubric: Critical Skill</u></p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.

<p>Math Practices</p> <p><u>CCSS.Math.Practice.MP1</u> Make sense of problems and persevere in solving them.</p> <p><u>CCSS.Math.Practice.MP2</u> Reason abstractly and quantitatively.</p> <p><u>CCSS.Math.Practice.MP3</u> Construct viable arguments and critique the reasoning of others.</p> <p><u>CCSS.Math.Practice.MP4</u> Model with mathematics.</p> <p><u>CCSS.Math.Practice.MP5</u> Use appropriate tools strategically.</p> <p><u>CCSS.Math.Practice.MP6</u> Attend to precision.</p> <p><u>CCSS.Math.Practice.MP7</u> Look for and make use of structure.</p> <p><u>CCSS.Math.Practice.MP8</u> Look for and express regularity in repeated reasoning.</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
<p>Enduring Understandings</p> <p>Students will explore theorems about triangles and their conjectures. Students will use deductive reason to develop proofs about triangles. Constructions will be used to explore applications of the properties of triangles.</p>	<p>Essential Questions</p> <ul style="list-style-type: none"> • How can properties of similar properties be applied to real world situations? • How can basic construction explorations help prove basic triangle properties? • Why are the properties of the centroid of a triangle important?
<p>Key Vocabulary</p> <ul style="list-style-type: none"> • Angle: Angles are created by two distinct rays that share a common endpoint (also known as a vertex). $\triangle ABC$ or $\angle B$ denote angles with vertex B. 	

- **Bisector:** A bisector divides a segment or angle into two equal parts.
- **Centroid:** The point of concurrency of the medians of a triangle.
- **Circumcenter:** The point of concurrency of the perpendicular bisectors of the sides of a triangle.
- **Coincidental:** Two equivalent linear equations overlap when graphed.
- **Complementary Angles:** Two angles whose sum is 90 degrees.
- **Congruent:** Having the same size, shape and measure. Two figures are congruent if all of their corresponding measures are equal.
- **Congruent Figures:** Figures that have the same size and shape.
- **Corresponding Angles:** Angles that have the same relative positions in geometric figures.
- **Corresponding Sides:** Sides that have the same relative positions in geometric figures
- **Dilation:** Transformation that changes the size of a figure, but not the shape.
- **Endpoints:** The points at an end of a line segment
- **Equiangular:** The property of a polygon whose angles are all congruent.
- **Equilateral:** The property of a polygon whose sides are all congruent.
- **Exterior Angle of a Polygon:** an angle that forms a linear pair with one of the angles of the polygon.
- **Incenter:** The point of concurrency of the bisectors of the angles of a triangle.
- **Intersecting Lines:** Two lines in a plane that cross each other.

Learning Objectives

Students will:

- Prove geometric theorems about triangles
- Make geometric constructions
- Apply geometric concepts modeling geometric situations

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning

PBA



Discovering Geometry – An Inductive Approach

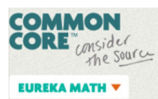
Adventurer: Dakota Davis, Land Heritage, Billiard Ball

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

Unit 3: Similarity



(2 days)

Prentice Hall Geometry 2-5

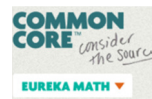
Page 131: Investigation

Ex 1 – 3 with Check/understanding

Vocabulary review

Supplementary

Suggested Homework and Practice



(2 days)

Prentice Hall Geometry 5-5

Example 2: Theorems 5-10, 5-11, 5-12 are essential to understanding.




Triangle congruence

Straw manipulative activity

Prentice Hall Geometry

Pages 277 # 4 - 27 (TD)

Math Practice: # 28, 32, 34 – 36, 40, 41

Developing proof: Page 278 # 33		
(2 days) Prentice Hall Geometry 4-5 Isosceles triangles Theorem 4-3 to 4-5 Page 211	<i>Angles</i> discovery – manipulatives Technology SMART Exchange	Prentice Hall Geometry Pages 213 – 214 # 7 – 16 Math Practices: 20, 29, 30, 31
(3 days) Prentice Hall Geometry Chapter 5-3 <i>Vocabulary important!</i> Examples 1 - 3 page 258		Prentice Hall Geometry Page 260 # 11 – 13 Page 262 # 32
(3 days) Prentice Hall Geometry Chapter 5-3 Theorems 5-6 and 5-7 Investigation Theorem 5-8, page 257	 Discovering Geometry – An Inductive Approach Chapter 3 Page 155 - 159	 Discovering Geometry – An Inductive Approach Pages 164: 10, 11, 12 and 13 Adventurer: Dakota Davis, Land Heritage, Billiard Ball  Geometry Teachers Activities Kit

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccsmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>

Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 4: Linear, Distance and Midpoint	Suggested number of instructional days: 20 days
<p>This unit builds on students' work from Geometric Transformations and properties of Triangles from previous units. Students formalize definitions of congruent triangles using this knowledge. Students reason to identify criteria for triangle congruence and use precise notation to describe the correspondence in congruent triangles.</p>	
STUDENT LEARNING GOALS	

<p><u>CCSS Math Standards</u></p> <p>Congruence G-CO</p> <p><u>Understand congruence in terms of rigid motions</u></p> <p>G-CO. 6 CCSS.Math.Content.HSG-CO.B.6</p> <p>G-CO. 7 Link: CCSS.Math.Content.HSG-CO.B.7</p> <p>G-CO. 8 Link: CCSS.Math.Content.HSG-CO.B.8</p>	<p><u>21st Century Skills and Expectations</u></p> <p><u>Rubric: Critical Skills</u></p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.
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<p><u>Math Practices</u></p> <p>CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.</p> <p>CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.</p> <p>CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.</p> <p>CCSS.Math.Practice.MP4 Model with mathematics.</p> <p>CCSS.Math.Practice.MP5 Use appropriate tools strategically.</p> <p>CCSS.Math.Practice.MP6 Attend to precision.</p> <p>CCSS.Math.Practice.MP7 Look for and make use of structure.</p> <p>CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
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<p><u>Enduring Understandings</u></p> <p>Students will develop and understanding and definition of congruent triangles and will identify criteria to prove triangles congruent.</p>	<p><u>Essential Questions</u></p> <ul style="list-style-type: none"> • How can you prove figures congruent? • How can corresponding parts be applied with congruency? • How can congruent figures be modeled in the real world?
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<p><u>Key Vocabulary</u></p> <p>http://intermath.coe.uga.edu/dictnary/descript.asp?termID=365</p> <ul style="list-style-type: none"> • Adjacent Angles: Angles in the same plane that have a common vertex and a common side, but no common interior

points.

- **Alternate Exterior Angles:** Alternate exterior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are outside the other two lines. When the two other lines are parallel, the alternate exterior angles are equal.
- **Alternate Interior Angles:** Alternate interior angles are pairs of angles formed when a third line (a transversal) crosses two other lines. These angles are on opposite sides of the transversal and are in between the other two.
- **Corresponding Angles:** Angles that have the same relative positions in geometric figures.
- **Corresponding Sides:** Sides that have the same relative positions in geometric figures
- **Dilation:** Transformation that changes the size of a figure, but not the shape.
- **Endpoints:** The points at an end of a line segment
- **Equiangular:** The property of a polygon whose angles are all congruent.
- **Equilateral:** The property of a polygon whose sides are all congruent.
- **Exterior Angle of a Polygon:** an angle that forms a linear pair with one of the angles of the polygon.
- **Regular Polygon:** A polygon that is both equilateral and equiangular.
- **Remote Interior Angles of a Triangle:** the two angles non-adjacent to the exterior angle.
- **Triangle:** A polygon with three sides.
- **Triangle, Isosceles:** A triangle with only two equal sides.
- **Triangle, Obtuse:** A triangle with only one obtuse angle.
- **Triangle, Right:** A triangle with only one right angle
- **Triangle, Scalene:** A triangle with no equal sides.

Learning Objectives

Students will:

- *Understand and apply congruence in figures*
- *Explain the criteria for triangle congruence*
- *Investigate applications that use triangle congruency and conjectures*

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning PBA: Buried Treasure



Discovering Geometry – An Inductive Approach: Page 264

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

Unit 4: Pythagorean Theorem and Application

Examples and Check Understanding should be used where appropriate.

Daily Note taking Worksheets used where needed. ☺

(3 days)

Prentice Hall Geometry 4-1 Congruent Triangles

Page 180

Ex 1 – 4 with Check/understanding

Example 4 - Include CPCTC

Overlap page 203

Supplementary



Suggested Homework and Practice

Prentice Hall Geometry

Pages: 182 - 185 # 1 – 52 (TD)

Focus on selection to show growth (miniset)

Math Practice: # 36, 37, 41, 44

<p>Investigation page 186 Chapter 4-2 and 4-3 with examples</p>		
<p>(14 days) Prentice Hall Geometry 4-1 Prove triangle congruence SSS, SAS, ASA Postulates: Chapter: 4-1 page 187 Postulates: Chapter: 4-2 page 188 Postulates: Chapter: 4-3 page 195 Investigation page 194</p>		<p>Prentice Hall Geometry Page 190 # 14 – 27 Math Practice # 33,34,35,41,42,43,44,45 – 48 Page 198 # 19 – 21 Paragraph/Proof/Justification Page 199 # 28, 29 and 35 Kuta Software: SSS, SAS and ASA (May need to change) QUIZ: Page 201 # 1 – 10</p>
<p>(3 Days) Application and Modeling of SSS, SAS and ASA</p>	<p>PBA: Buried Treasure  Discovering Geometry – An Inductive Approach: Page 264</p>	<p> Discovering Geometry – An Inductive Approach: Page 246 - 263</p>

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccssmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>

Geometry Sequenced Units for the Common Core State Standard in Mathematics
Stratford Public Schools

Unit 5: Pythagorean Theorem and Application	Suggested number of instructional days: 15 days
This unit focuses on dilations and similarity and moves away from rigid motion. Students prove theorems involving similarity and apply dilations and similarity to model situations in the real world.	
STUDENT LEARNING GOALS	
<p><u>CCSS Math Standards</u> Congruence G-CO <i>Prove geometric theorems</i> G-CO. 10 Link: CCSS.Math.Content.HSG-CO.C.10</p> <p><u>CCSS.Math.Content.8.G.A.4</u> Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p> <p>Similarity, Right Triangles, & Trigonometry G-SRT <i>Understand similarity in terms of similarity transformations</i> G-SRT 1.Link: CCSS.Math.Content.HSG-SRT.A.1</p> <p>G-SRT 1.a Link: CCSS.Math.Content.HSG-SRT.A.1a</p> <p>G-SRT 1.b Link: CCSS.Math.Content.HSG-SRT.A.1b</p> <p>G-SRT 2. Link: CCSS.Math.Content.HSG-SRT.A.2.</p> <p>G-SRT 3. Link: CCSS.Math.Content.HSG-SRT.A.3</p> <p>Prove theorems involving similarity G-SRT G-SRT 4. Link: CCSS.Math.Content.HSG-SRT.B.4</p> <p>G-SRT 5. Link: CCSS.Math.Content.HSG-SRT.B.5</p> <p>Modeling with Geometry G-MG <i>Apply geometric concepts in modeling situations</i> G-MG 3. Link: CCSS.Math.Content.HSG-MG.A.3</p>	<p><u>21st Century Skills and Expectations</u> Rubric: Critical Skills</p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.
<p><u>Math Practices</u></p> <p><u>CCSS.Math.Practice.MP1</u> Make sense of problems and persevere in solving them.</p> <p><u>CCSS.Math.Practice.MP2</u> Reason abstractly and quantitatively.</p> <p><u>CCSS.Math.Practice.MP3</u> Construct viable arguments and critique the reasoning of others.</p> <p><u>CCSS.Math.Practice.MP4</u> Model with mathematics.</p> <p><u>CCSS.Math.Practice.MP5</u> Use appropriate tools strategically.</p> <p><u>CCSS.Math.Practice.MP6</u> Attend to precision.</p> <p><u>CCSS.Math.Practice.MP7</u> Look for and make use of structure.</p> <p><u>CCSS.Math.Practice.MP8</u> Look for and express regularity in repeated reasoning.</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project</p>

and self-management.

Enduring Understandings

Students will develop an understanding of dilations and similarity of figures. They will prove and apply similarity and dilations to model real world situation that include the use of scale factor.

Essential Questions

- How can students verify experimentally the properties of dilations?
- How do you prove that figures are similar?
- How can proportions be used to solve problems to find missing lengths?

Key Vocabulary

- **Equiangular:** The property of a polygon whose angles are all congruent.
- **Equilateral:** The property of a polygon whose sides are all congruent.
- **Exterior Angle of a Polygon:** an angle that forms a linear pair with one of the angles of the polygon.
- **Incenter:** The point of concurrency of the bisectors of the angles of a triangle.
- **Measure of each Interior Angle of a Regular n-gon:**
- **Orthocenter:** The point of concurrency of the altitudes of a triangle.
- **Proportion:** An equation which states that two ratios are equal.
- **Ratio:** Comparison of two quantities by division and may be written as r/s , $r:s$, or r to s .
- **Reflection:** A transformation that "flips" a figure over a line of reflection
- **Reflection Line:** A line that is the perpendicular bisector of the segment with endpoints at a pre-image point and the image of that point after a reflection.
- **Regular Polygon:** A polygon that is both equilateral and equiangular.
- **Remote Interior Angles of a Triangle:** the two angles non-adjacent to the exterior angle.
- **Rotation:** A transformation that turns a figure about a fixed point through a given angle and a given direction.
- **Scale Factor:** The ratio of any two corresponding lengths of the sides of two similar figures.
- **Similar Figures:** Figures that have the same shape but not necessarily the same size.
- **Sum of the Measures of the Interior Angles of a Convex Polygon:** $180^\circ(n - 2)$.
- **Supplementary Angles:** Two angles whose sum is 180 degrees.
- **Transformation:** The mapping, or movement, of all the points of a figure in a plane according to a common operation.
- **Translation:** A transformation that "slides" each point of a figure the same distance in the same direction
- **Transversal:** A line that crosses two or more lines.
- **Vertical Angles:** Two nonadjacent angles formed by intersecting lines or segments - also called opposite angles.

Learning Objectives / Grade Level Expectations***

Students will:

- Prove geometric theorems about triangles
- Understand and prove theorems regarding similarity and dilation
- Apply geometric concepts in modeling real world situations

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning

**PBA: Dilations
Finger Print on Grid activity
Scale Factor Project**

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

**Unit 5: Similarity Transformations
15 days**

Examples and Check Understanding should be used where appropriate.

Daily Note taking Worksheets used where needed. 😊

(2 days)

Prentice Hall Geometry 5-1

Investigation page 243

Page 244

Ex 1 – 3 with Check/understanding

Supplementary

Midpoint/ mid-segments

Suggested Homework and Practice

Prentice Hall Geometry

Pages: 246 # 1 – 19

Math Practice: page 247 # 20,21, 27, 28, 33,40 - 46

(4 days)

Prentice Hall Geometry 8-2

Similar Polygons

Page 423

Ex 1 and 2 with Check/understanding

Prentice Hall Geometry 8-3

Proving similar Triangles

Chapter 8–3 page 432

Investigation 8-3 and Postulate 8-1

Example 1 page 433 with check

Prentice Hall Geometry 8-4

Similarity in Right triangles

Investigation 8-4 page 439

Similar Polygons

Link to Similar triangles and ratio of sides

3,4,5 and 6,8,10

Prentice Hall Geometry

8 – 2: Page 425 # 1 – 12,17 – 20,



Math Practice # 48

Prentice Hall Geometry

Pages: 436 # 17, 19, 40

Math Practice: 247 # 20,21, 27, 28, 33

40 – 46

<p>Dilations (4 days) + 1 PBA</p>	<p>Investigation: www.santarosa.k12 dilations worksheet</p> <p>SMART Board exchange link</p>  <p>Discovering Geometry – An Inductive Approach: Page 588</p> <p>Comap link page 228</p>	 <p>Discovering Geometry – An Inductive Approach Page 588 # 29 – 33</p> <p>Project COMAP page 234 Finger Print on Grid activity Scale Factor Project</p>
<p>(4 days)</p> <p>Prentice Hall Geometry 8-5 Proportions in Triangles</p> <p>Page 446- 448 Theorem 8-4, Examples 1 and 2 Theorem 8-5, Example 3 with check</p>	<p><u>PBA: Dilations</u></p> <p>Finger Print on Grid activity Scale Factor Project</p> <p>Checkpoint Quiz page 452</p>	<p>Prentice Hall Geometry Pages: 448- 450 # 1 - 26 Math Practice: 31, 35, 37 – 39,48 - 50</p>

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccssmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>

Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 6: Right Triangle Relationships and Trigonometry	Suggested number of instructional days: 20 days
<p>This unit extends the idea of similarity to indirect measurements. Students develop properties of special right triangles and use properties of similar triangles to develop trigonometric ratios. Students apply these ideas as they model real-world situations and solve problems involving unknown side lengths and angle measures.</p>	
STUDENT LEARNING GOALS	
<p><u>CCSS Math Standards</u> Similarity, Right Triangles, & Trigonometry G-SRT Prove theorems involving similarity G-SRT 5. Link: CCSS.Math.Content.HSG-SRT.B.5 <u>Define trigonometric ratios and solve problems involving right triangles</u> G-SRT 6. Link: CCSS.Math.Content.HSG-SRT.C.6 G-SRT 7. Link: CCSS.Math.Content.HSG-SRT.C.7 G-SRT 8. Link: CCSS.Math.Content.HSG-SRT.C.8 Expressing Geometric Properties with Equations G-GPE <u>Use coordinates to prove simple geometric theorems algebraically</u> G-GPE Link: CCSS.Math.Content.HSG-GPE.B.7 Modeling with Geometry G-MG <u>Apply geometric concepts in modeling situations</u> G-MG 1. Link: CCSS.Math.Content.HSG-MG.A.1 G-MG 3. Link: CCSS.Math.Content.HSG-MG.A.3</p>	<p><u>21st Century Skills and Expectations</u> <u>Rubric: Critical Skills</u></p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.
<p><u>Math Practices</u></p> <p>CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.</p> <p>CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.</p> <p>CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.</p> <p>CCSS.Math.Practice.MP4 Model with mathematics.</p> <p>CCSS.Math.Practice.MP5 Use appropriate tools strategically.</p> <p>CCSS.Math.Practice.MP6 Attend to precision.</p> <p>CCSS.Math.Practice.MP7 Look for and make use of structure.</p> <p>CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Student display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>


<p>Enduring Understandings</p> <p>Students will use properties of similar triangles to develop trigonometric ratios and properties of special right triangles. Students will apply their understandings in order to model real world situations.</p>	<p>Essential Questions</p> <ul style="list-style-type: none"> • How are trigonometric ratios used in right triangles to solve problems? • How can special right triangles be helpful in solving real world problems efficiently? • Where can right triangles be used in the real world?
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<p>Key Vocabulary</p> <ul style="list-style-type: none"> • Adjacent side: In a right triangle, for each acute angle in the interior of the triangle, one ray forming the acute angle contains one of the legs of the triangle and the other ray contains the hypotenuse. This leg on one ray forming the angle is called the adjacent side of the acute angle. • For any acute angle in a right triangle, we denote the measure of the angle by θ and define three numbers related to θ as follows: <ul style="list-style-type: none"> $\text{sine of } \theta = \sin(\theta) = \frac{\text{length of opposite side}}{\text{length of hypotenuse}}$ $\text{cosine of } \theta = \cos(\theta) = \frac{\text{length of adjacent side}}{\text{length of hypotenuse}}$ • Complementary angles: Two angles whose sum is 90° are called complementary. Each angle is called the complement of the other. • Opposite side: In a right triangle, the side of the triangle opposite the vertex of an acute angle is called the opposite side relative to that acute angle. • Similar triangles: Triangles are similar if they have the same shape but not necessarily the same size. • Triangles whose corresponding angles are congruent are similar. • Corresponding sides of similar triangles are all in the same proportion. • Reflection: A transformation that "flips" a figure over a line of reflection • Reflection Line: A line that is the perpendicular bisector of the segment with endpoints at a pre-image point and the image of that point after a reflection. • Rotation: A transformation that turns a figure about a fixed point through a given angle and a given direction. • Scale Factor: The ratio of any two corresponding lengths of the sides of two similar figures. • Similar Figures: Figures that have the same shape but not necessarily the same size. • Transformation: The mapping, or movement, of all the points of a figure in a plane according to a common operation. • Translation: A transformation that "slides" each point of a figure the same distance in the same direction 	
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<p>Learning Objectives / Grade Level Expectations</p> <p><i>Students will:</i></p> <ul style="list-style-type: none"> • <i>Explain the relationship between the trigonometric ratios</i> • <i>Define and apply special right triangles and trigonometric ratios</i> • <i>Apply geometric relationships with special right triangles and trigonometric ratios to solve real world applications</i> 	
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ASSESSMENT PLAN	
<p>Summative Assessment(s)/Performance Based Assessments including 21st Century Learning</p> <p>PBA: Yard and Garden Solid Engineering Ice-Cream project</p>	<p>Formative and Diagnostic Assessment(s)</p> <ul style="list-style-type: none"> • Verbal assessments • Informal assessments of class work • Weekly quiz • Homework review • Chapter Assessment

LEARNING PLAN COMPONENTS

Unit 6: 20 days	Supplementary	Suggested Homework and Practice
<p>Right Triangle Relationships and Trigonometry <i>Examples and Check Understanding should be used where appropriate.</i> <i>Daily Note taking Worksheets used where needed.</i> ☺ (10 days) (2 of 10 days) Proportions in Triangles Prentice Hall Geometry 9-3 Investigation page 482 Ex 1, 2 and 3 w/check understanding Vocabulary, technology and Calculators</p>	<p>Trig Ratio Investigation Worksheet</p> <p>Investigation</p>  <p>Discovering Geometry – An Inductive Approach Page 642 – 648</p>	<p>Prentice Hall Geometry Pages: 484 # 1 – 21 Math Practice: # 22 a & b, 23,28,29,33,34</p>
<p>(10 days) Distance formula (perimeter, area of polygons)</p>	<p>Finding area, perimeter and distance of triangles on a grid format.</p> <p>Stretching and Shrinking http://www.mrpilato.com/connected.cfm</p> <p>Waterbury.k12 Expedition in your classroom **</p>	<p>PBA: Yard and Garden Amount of soil, number and shape of beds</p> <p>PBA: Solid Engineering (Thinking outside the Box) Ice-Cream project</p>

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccssmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>

Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 7: Quadrilaterals	Suggested number of instructional days: 15 days
<p>This unit solidifies students' previous work on triangles and extends this to work on the study of Quadrilaterals. The concept of triangle congruence is used as students prove theorems about parallelograms. This unit also provides an opportunity for students to become proficient with coordinate proofs and reasoning.</p>	
STUDENT LEARNING GOALS	
<p><u>CCSS Math Standards</u></p> <p><i>Understand and apply the Pythagorean Theorem.</i> CCSS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse. CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. UTube Pythagorean theorem http://www.youtube.com/watch?v=QCyvXyLFSfU</p> <p><i>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</i> CCSS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems Congruence G-CO <u>Prove geometric theorems</u> G-CO. 11 Link: CCSS.Math.Content.HSG-CO.C.11</p> <p>Expressing Geometric Properties with Equations G-GPE <u>Use coordinates to prove simple geometric theorems algebraically</u> G-GPE. 4 Link: CCSS.Math.Content.HSG-GPE.B.4</p> <p>; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle</p>	<p><u>21st Century Skills and Expectations</u></p> <p><u>Rubric: Critical Skills</u></p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.

<p>centered at the origin and containing the point $(0, 2)$.</p>	
<p>Math Practices CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them. CCSS.Math.Practice.MP2 Reason abstractly and quantitatively. CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others. CCSS.Math.Practice.MP4 Model with mathematics. CCSS.Math.Practice.MP5 Use appropriate tools strategically. CCSS.Math.Practice.MP6 Attend to precision. CCSS.Math.Practice.MP7 Look for and make use of structure. CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.</p>	<p>Interdisciplinary Standards (Technology Integration)</p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
<p>Enduring Understandings</p> <p>Students will discover and prove theorems about parallelograms and other quadrilaterals. Coordinate proofs will be used to explore properties of quadrilaterals.</p>	<p>Essential Questions</p> <ul style="list-style-type: none"> • How can you prove that a quadrilateral is a parallelogram? • How can you use the properties of the quadrilateral to solve real world problems?

- How can you use coordinates to prove theorems about quadrilaterals?

Key vocabulary

- **Scale Factor:** The ratio of any two corresponding lengths of the sides of two similar figures.
- **Similar Figures:** Figures that have the same shape but not necessarily the same size.
- **Sum of the Measures of the Interior Angles of a Convex Polygon:** $180^\circ(n - 2)$.
- **Supplementary Angles:** Two angles whose sum is 180 degrees.
- **Transformation:** The mapping, or movement, of all the points of a figure in a plane according to a common operation.
- **Translation:** A transformation that "slides" each point of a figure the same distance in the same direction
- **Transversal:** A line that crosses two or more lines.
- **Vertical Angles:** Two nonadjacent angles formed by intersecting lines or segments, also called opposite angles.
- **Quadrilateral:** A polygon with 4 sides.
- **Similar Figures:** Figures that have the same shape but not necessarily the same size.

Learning Objectives / Grade Level Expectations***

Students will:

- Describe the relationships between different quadrilaterals
- Prove theorems about parallelograms
- Apply theorems to solve for missing measurements in quadrilaterals
- Model situations that use theorems about quadrilaterals

ASSESSMENT PLAN

Summative Assessment(s)/Performance Based Assessments including 21st Century Learning

**PBA: Floor pattern
Border Tiles**

Formative and Diagnostic Assessment(s)

- Verbal assessments
- Informal assessments of class work
- Weekly quiz
- Homework review
- Chapter Assessment

LEARNING PLAN COMPONENTS

**Unit 7: 15 days
Quadrilaterals**

Examples and Check Understanding should be used where appropriate.

Daily Note taking Worksheets used where needed. 😊

(2 days)

Supplementary

Anglegs activity

Suggested Homework and Practice

Prentice Hall Geometry
Pages: 290 - 293 # 7 – 26 (TD)
Math Practice: # 27, 36 – 42, 50

<p>Prentice Hall Geometry 6-1 ☺ Note-taking worksheet</p>		
<p>(2 days) Prentice Hall Geometry 6-2 Properties of parallelograms – Real World connection Page 297: Example 4 Reading page 302 (# 56 on page 300)</p>		<p>Prentice Hall Geometry Pages: 297 – 300 # 53, 57 or 58 Page 300 # 44 - 52</p>
<p>(2 days) Prentice Hall Geometry 6-3 Proving that a Quadrilateral is a Parallelogram Investigation page 306 Ex: 3 Critical Thinking</p>	<p>Technology: Computer lab: Page 311 Distance Formula Critical thinking GeoBoards</p>	<p>Prentice Hall Geometry Pages: 308 – 309 # 16, 17, 26 – 29, 32 – 34 (#19 – 25 - TD)</p>
<p>(2 days) Prentice Hall Geometry 6-4 Special parallelograms Page 312 Review and Ex: 4 Real World Connections</p>		<p>Prentice Hall Geometry Pages: 318 # 22, 23, 38, 30 – 44, 54 Page 234 # 1 – 25 (TD)</p>
<p>(2 days) Prentice Hall Geometry 6-5 Trapezoids and Kites Page 320 - Review and Real World</p>		<p>Prentice Hall Geometry Math practice # 27, 28, 29, 30 ,31</p>
<p>(2 days) Chapter 6-6 Placing figures in a coordinate plane Page 326 Examples 1 and 2</p>		<p>Prentice Hall Geometry Page 328 # 1 – 12</p>
<p>(2 days) Prentice Hall Geometry 6-7 Proofs using coordinate geometry Page 338 – Test Taking Strategies Drawing a Diagram # 1 – 5</p>	<p>PBA: M.A.P Floor pattern Border Tiles</p>	<p>Prentice Hall Geometry Page 335 # 12 - 24</p>

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccsmath.org/>

- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snpapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf>


Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 8: Circles	Suggested number of instructional days: 15 days
<p>This unit solidifies students' previous work with geometric exploration. Students develop rigorous definitions of three familiar congruence transformations: reflections, translations and rotations. Students use these transformations to discover and prove geometric properties. Throughout the course, students will use transformations as a tool to analyze and describe relationships between geometric figures.</p>	
STUDENT LEARNING GOALS	
<p>CCSS Math Standards Congruence G-CO <u>Make geometric constructions</u> G-CO.13 Link: CCSS.Math.Content.HSG-CO.D.13</p> <p>Circles G-C <u>Understand and apply theorems about circles</u> G-C.1 Link: CCSS.Math.Content.HSG-C.A.1 G-C.2 Link: CCSS.Math.Content.HSG-C.A.2 G-C.3 Link: CCSS.Math.Content.HSG-C.A.3 G-C.4 Link: CCSS.Math.Content.HSG-C.A.4 (+) <u>Find arc lengths and areas of sectors of circles</u> G-C.5 Link: CCSS.Math.Content.HSG-C.B.5</p> <p>Expressing Geometric Properties with Equations G-GPE <u>Translate between the geometric description and the equation for a conic section</u> G-GPE.1 Link: CCSS.Math.Content.HSG-GPE.A.1 <u>Use coordinates to prove simple geometric theorems algebraically</u> G-GPE.4 Link: CCSS.Math.Content.HSG-GPE.B.4</p> <p>Geometric Measurement & Dimension G-GMD <u>Explain volume formulas and use them to solve problems</u> G-GMD.1 Link: CCSS.Math.Content.HSG-GMD.A.1</p> <p>Modeling with Geometry G-MG <u>Apply geometric concepts in modeling situations</u> G-MG.1 Link: CCSS.Math.Content.HSG-MG.A.1</p>	<p>21st Century Skills and Expectations Rubric: Critical Skills</p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.
<p>Math Practices CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them. CCSS.Math.Practice.MP2 Reason abstractly and quantitatively. CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others. CCSS.Math.Practice.MP4 Model with mathematics. CCSS.Math.Practice.MP5 Use appropriate tools strategically. CCSS.Math.Practice.MP6 Attend to precision. CCSS.Math.Practice.MP7 Look for and make use of structure. CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.</p>	<p>Interdisciplinary Standards (Technology Integration)</p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
Enduring Understandings	Essential Questions

<p>Students will explore properties of circles and apply them to real life applications. Students will be able to name and derive the equations of circles in standard and vertex form in the coordinate plane.</p>	<ul style="list-style-type: none"> • How do you write the equation of a circle in the coordinate plane? • How can you use circles to model real life situations? • How are area and circumference used to find the arc length and area of a sector?
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<p>Key Vocabulary</p> <ul style="list-style-type: none"> • Central Angle-an angle whose vertex is at the center of a circle • Inscribed Angle-an angle whose vertex is on the circle and whose sides contain chords of a circle • Arc-an unbroken part of a circle; minor arcs have a measure less than 180°; semicircles are arcs that measure exactly 180°; major arcs have a measure greater than 180° • Chord-a segment whose endpoints are on a circle • Tangent Line-a line in the plane of a circle that intersects a circle at only one point, the point of tangency • Secant Line-a line in the plane of a circle that intersects a circle at exactly two points • Secant Segment-a segment that contains a chord of a circle and has exactly one endpoint outside of the circle • Inscribed Polygon-a polygon whose vertices all lie on a circle • Inscribed Circle-a circle enclosed in a polygon, where every side of the polygon is a tangent to the circle; specifically for this unit the polygon will be a triangle and so the center of the Inscribed Circle is the incenter of the triangle • Circumscribed Circle-a circle containing an inscribed polygon; for this unit the polygon will be a triangle and so the center of the circle will be the circumcenter of the triangle. • Arc Length-a portion of the circumference of the circle • Sector-the region bounded by two radii of the circle and their intercepted arc • Pythagorean Theorem: A theorem that states that in a right triangle, the square of the length of the hypotenuse equals the sum of the squares of the lengths of the legs. • Radius: The distance from the center of a circle to any point on the circle. Also, the line segment that has the center of the circle as one endpoint and a point on the circle as the other endpoint. • Standard Form of a Circle: $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the center and r is the radius. 	
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<p>Learning Objectives / Grade Level Expectations*** <i>Students will:</i></p> <ul style="list-style-type: none"> • <i>Make geometric constructions with circles</i> • <i>Model real world applications with circles</i> • <i>Describe relationships of the parts of a circle</i> • <i>Use inscribed and circumscribed figures to model and solve real world problems</i> 	
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ASSESSMENT PLAN	
<p>Summative Assessment(s)/Performance Based Assessments including 21st Century Learning PBA:  Discovering Geometry – An Inductive Approach</p>	<p>Formative and Diagnostic Assessment(s)</p> <ul style="list-style-type: none"> • Verbal assessments • Informal assessments of class work • Weekly quiz • Homework review • Chapter Assessment

LEARNING PLAN COMPONENTS

<p>Unit 8: Circles (Suggested)15 days <i>Examples and Check Understanding should be used where appropriate.</i> <i>Daily Note taking Worksheets used where needed.</i> ☺</p> <p>(4 days) Prentice Hall Geometry 11-1 Chapter 11 recap Vocabulary page 581 include area of circle, circumference etc. Pages 582 – 585 Examples # 1 – 5 with check understanding</p>	<p>Supplementary</p> <p>(2 days) Begin with: Geogebra Applet http://www.geogebraTube.org/student/m279 Area of Circles</p> <p>Geometry problems M.A.R.S. Circles and Triangles (TD)</p> <p>Illustrative Math Triangles and Hexagons within circles.</p>	<p>Suggested Homework and Practice</p> <p>Prentice Hall Geometry Page 586 # 1 – 37 (TD) Math practices #1 – 9, 20 – 22, 23c, 29, 31, 35 (Algebra link)</p>
<p>(3 days) Prentice Hall Geometry 7 Circles and Arcs Page 388 Examples 4 and 5 only</p>	<p>TI Activity Area Form Activity or Similar Shmoop University Circle worksheets</p>	<p>Prentice Hall Geometry Page 393 # 72 and 75</p>
<p>(3 days) Prentice Hall Geometry 7-7 Areas of circles and sectors Page 395 Investigation and Example 2 ☺ Note-taking</p>	<p>Arc Length - Geometry Calculator <i>Analyze math link</i></p> <p>Arc Arc Arc Calculating Arc Lengths - <i>link</i></p>	<p>Prentice Hall Geometry Page 398 # 7 – 16 Math Practices # 22,23,24,28,29c and 31</p>
<p>(Pilot year)</p> <p>(4 days) Prentice Hall 11-5 Circles in the coordinate plane Examples 1- 4 <i>Completing the Square NOT in Algebra yet so will need to be taught for 2013 - 2014</i></p>	<p>KutaSoftware Equations of Circles Illuminations examples http://illuminations.nctm.org/LessonDetail.aspx?ID=L691</p> <p>PBA:  Discovering Geometry – An Inductive Approach The Circumference/Diameter Ratio</p>	<p>Prentice Hall Geometry Page 617 - 619 # 1 – 64 (TD) Math Practices # 27 – 38</p> <p>M.A.R.S Temple Geometry Circles and Triangles</p>

LEARNING RESOURCES

- Prentice Hall Mathematics – Geometry
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- Differentiation of Special Needs students
- <http://ccsmath.org/>
- <http://illustrativemathematics.org/>
- <http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/>
- <http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/>
- <https://www.teachingchannel.org/videos/technology-and-math>
- <http://www.insidemathematics.org/index.php/common-core-math-intro>
- <http://www.ccsstoolbox.com/>
- <https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true>
- <http://www.corestandards.org/Math/Content/HSG/GPE>
- <http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf>
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf>

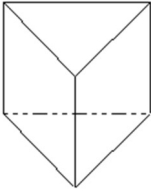
- <http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf>
- http://www.analyzemath.com/Geometry_calculators/arc_length_area_sector.html
- http://www.math-prof.com/Geom/Geom_Ch_32.asp
- <http://www.worsleyschool.net/science/files/sector/calculations.html>
- <http://www.easycalculation.com/area/circle.php>
- <http://www.easycalculation.com/area/learn-circle.php>
- http://www.teachertube.com/viewVideo.php?video_id=1423&title=Geo_Screencast_Sector_Area
- <http://www.youtube.com/watch?v=anV3HI-1vY&feature=related>

Geometry Sequenced Units for the Common Core State Standard in Mathematics

Unit 9: Geometric Modeling in 2D and 3D	Suggested number of instructional days: 30 days
<p>This unit explores three-dimensional geometry including representations of real-world situations with three-dimensional objects and calculating volume. Students make connections between two-dimensional and three-dimensional representations of objects. This course culminates with modeling problems involving three-dimensional objects, allowing students to integrate their knowledge and apply complex geometric reasoning to real-life problems. This unit provides an opportunity to bring together all of the relationships students have learned in this unit and apply them to real-world situations. The focus is on in-depth problems that require students to draw on their understanding of geometric figures and strategically use the tools that have been developing throughout the units.</p>	
STUDENT LEARNING GOALS	
<p><u>CCSS Math Standards</u></p> <p><i>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</i> CCSS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems Geometric Measurement & Dimension G-GMD <u>Explain volume formulas and use them to solve problems</u> G-GMD 1. Link: CCSS.Math.Content.HSG-GMD.A.1 G-GMD 3. Link: CCSS.Math.Content.HSG-GMD.A.3</p> <p><u>Visualize relationships between two-dimensional and three-dimensional objects</u></p> <p>G-GMD 4. Link: CCSS.Math.Content.HSG-GMD.B.4 Modeling with Geometry G-MG <u>Apply geometric concepts in modeling situations</u> G-MG 1. Link: CCSS.Math.Content.HSG-MG.A.1</p> <p>G-MG 2. Link: CCSS.Math.Content.HSG-MG.A.2</p> <p>G-MG 3. Link: CCSS.Math.Content.HSG-MG.A.3</p>	<p><u>21st Century Skills and Expectations</u></p> <p><u>Rubric: Critical Skills</u></p> <ol style="list-style-type: none"> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding and ethical behavior.
<p><u>Math Practices</u></p> <p>CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them. CCSS.Math.Practice.MP2 Reason abstractly and quantitatively. CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others. CCSS.Math.Practice.MP4 Model with mathematics. CCSS.Math.Practice.MP5 Use appropriate tools strategically. CCSS.Math.Practice.MP6 Attend to precision. CCSS.Math.Practice.MP7 Look for and make use of structure. CCSS.Math.Practice.MP8</p>	<p><u>Interdisciplinary Standards (Technology Integration)</u></p> <p>Standard 1: Information Strategies Students determine their need for information and apply strategies to select, locate, and access information resources.</p> <p>Standard 2: Information Use Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p>Standard 3: Information and Technology Application Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.</p> <p>Standard 4: Literacy and Literary Appreciation Students extract meaning from fiction and non-fiction resources</p>


<p>Look for and express regularity in repeated reasoning.</p>	<p>in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.</p> <p>Standard 5: Personal Management</p> <p>Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p>
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<p>Enduring Understandings</p> <p>A student will apply their 2 dimensional geometry knowledge to 3 dimensional real world geometric applications. Students will use models to investigate surface area and volume and make these connections to real world problems.</p>	<p>Essential Questions</p> <ul style="list-style-type: none"> • How can you apply volume and surface area rules to real world problems? • How are 2 dimensional skills connected to 3 dimension applications? • Where in the real world will surface area needed to be addressed?
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<p>Key Vocabulary</p> <p>http://intermath.coe.uga.edu/dictionary/descript.asp?termID=5</p> <p>Prism: A polyhedron with two parallel and congruent faces, called bases, and all other faces that are parallelograms.</p>  <p>This is a triangular prism. The triangular part refers to the two triangles which are in parallel planes. The triangles are the <i>bases</i> of the prism.</p> <p>Sphere: The set of all points in space that are equidistant from a fixed point, called the center.</p> <p>Two-Dimensional Figures that have length and width (no thickness).</p> <p>Three- dimensional figures have length, width and height</p>
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<p>Learning Objectives / Grade Level Expectations***</p> <p><i>Students will:</i></p> <ul style="list-style-type: none"> • Investigate models that require depth of understanding regarding surface area and volume • Apply geometric methods to solve design problems • Use maximum and minimum modeling with surface area and volume
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<p>Summative Assessment(s)/Performance Based Assessments including 21st Century Learning</p> <ul style="list-style-type: none"> • PBA – SBAC Packaging Cans Group A, B and C 	<p>Formative and Diagnostic Assessment(s)</p> <ul style="list-style-type: none"> • Verbal assessments • Informal assessments of class work • Weekly quiz • Homework review • Chapter Assessment
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LEARNING PLAN COMPONENTS		
<p>Unit 9: 30 days Geometric Modeling in Two Dimensions</p> <p>Prentice Hall Geometry 10-3 to 10-8 Modeling Unit Surface area Volume Formulas Circles:</p> <ul style="list-style-type: none"> • Area • Circumference <p>Cylinders Pyramids Cones Spheres</p>	<p>Supplementary</p> <p>YouTube: How do they make this? http://www.youtube.com/watch?v=m7ljnHIdcGY Tennis Balls Soccer Balls</p> <p>PBA:  Discovering Geometry – An Inductive Approach Chapter 11</p> <p>PBA – SBAC Packaging Cans Group A, B and C</p> <p>NYC Task A Day at the Beach – <i>Link</i></p> <p>Cumulative review and assessment</p>	<p>Suggested Homework and Practice</p> <p>Modeling: Real World</p> <p>Illuminations NCTM Soda Cans</p> <p>M.A.P Fearless Frames Bestsize cans</p> <p>Project: Carnival ice Cream Stand</p> <p>Illustrative Math Project Soda Cans</p>

LEARNING RESOURCES
<ul style="list-style-type: none"> • Prentice Hall Mathematics – Geometry • https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true • Differentiation of Special Needs students • http://ccssmath.org/ • http://illustrativemathematics.org/ • http://commoncoretools.me/2011/01/16/the-illustrative-mathematics-project/ • http://www.smarterbalanced.org/k-12-education/common-core-state-standards-tools-resources/ • https://www.teachingchannel.org/videos/technology-and-math • http://www.insidemathematics.org/index.php/common-core-math-intro • http://www.ccsstoolbox.com/ • https://www.pearsonsuccessnet.com/snapp/login/login.jsp?showLoginPage=true • http://www.corestandards.org/Math/Content/HSG/GPE • http://nplainfieldmath.wikispaces.com/file/view/Pizzazz+Algebra.pdf • http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20B.pdf • http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20C.pdf • http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20D.pdf • http://lcms.dadeschools.net/math/Pizzazz%20Books/Pizzazz%20Book%20E.pdf • http://wvde.state.wv.us/strategybank/FrayerModel.html • http://intermath.coe.uga.edu/dictnary/descript.asp?termID=5 • http://schools.nyc.gov/NR/rdonlyres/C03D80B2-9213-43A9-AAA3-BB0032C62F4F/139657/NYCDOE_G10_ADayattheBeach_FINAL1.pdf