

Course Title: Honors Geometry
Board Approval Date: January 7, 2020
Credit / Hours: 1 credit

Course Description:

Honors geometry focuses on mastery of the PA Core Standards for Mathematics at an in depth and accelerated rate. Students will incorporate and apply skills from algebra 1 in acquiring, understanding, and mastering concepts in geometry. Geometry aims to improve students abilities in the areas of points, lines, planes, angles, deductive reasoning, parallel lines and planes, congruent triangles, quadrilaterals, similar polygons, right triangles, circles, areas of plane figures, areas and volumes of solids, and coordinate geometry.

Learning Activities / Modes of Assessment:

Pre - tests Teacher Observation Kahoot, Quizizz and Quizlet Notability Bell Ringers Exit Tickets Collaborative Projects Small Group Whole Group Partner Work Whiteboard Practice Review Games Desmos Activities GeoGebra Think-Pair-Share Stations	Scavenger Hunts Nearpod Edpuzzles Flipgrid Constructed Response Questions Math Libs Task Cards Schoolology Assignments Error Analysis Self-checking with answer key Word Problems- real world application Quizzes Tests
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Instructional Resources:

Desmos

SAS

Online Practice Tools

Khan Academy

IXL

Teachers Pay Teachers

Teacher created resources

Kuta Software

Instructional Multimedia Tools

Curriculum:

Course: **Honors Geometry**

Unit: Geometry Basics

Know:

Understand:

Do:

<p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• Figures contain points, lines and planes• Foundational postulates, theorems, and definitions of geometry• Formulas to solve problems in the coordinate plane• Relationships in angles	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Calculate the distance and/or midpoint between two points on a number line or on a coordinate plane.• Identify points, lines and planes in a figure• Use angle relationships to solve problems• Solve for segment and angle measures
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Unit: Logic + Proof

Know:

Understand:

Do:

<p>CC.2.3.HS.A.6 - Verify and apply theorems involving similarity as they relate to plane figures.</p> <p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• Inductive and deductive reasoning• How to write two column proofs• Conditional statements and their truth values	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Write, analyze, complete, or identify formal proofs• Identify patterns to write conjectures• Use counterexamples• Write conditional statements and their related conditional statements• Identify and write biconditional statements• Form conclusions using laws of logic
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Unit: Parallel + Perpendicular Lines

Know:

Understand:

Do:

<p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.HS.A.11 - Apply coordinate geometry to prove simple geometric theorems algebraically.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• Angle relationships between parallel lines and transversals• How to prove lines parallel• Graphing and writing linear equations• Slope of parallel and perpendicular lines	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Use properties of angles formed when two parallel lines are cut by a transversal to find the measures of missing angles.• Write, analyze, complete, or identify formal proofs• Identify parallel and perpendicular lines on the coordinate plane• Write equations of parallel and perpendicular lines• Graph linear equations from various forms
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Unit: Congruence and Relationships in Triangles

Know:

Understand:

Do:

Know:	Understand:	Do:
<p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.</p> <p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.</p> <p>CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> ● Triangles can be classified by sides and angles ● Theorems related to triangles ● Properties of isosceles and equilateral triangles ● How to prove triangles congruent ● Segments in triangles ● Centers of Triangles 	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Identify and/or use properties of isosceles and equilateral triangles ● Write congruency statements ● Identify triangle congruence types ● Write, analyze, complete, or identify formal proofs ● Solve problems using properties of angles in triangles ● Identify segments in triangles and apply to solve problems ● Order sides and angles of triangles ● Apply the triangle inequality theorem ● Identify Centers of Triangles ● Solve problems involving centers of triangles

Unit: Polygons + Quadrilateral

Know:

Understand:

Do:

<p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.</p> <p>CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• Different polygons have special relationship between their sides, diagonals and angles	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Identify and/or use properties of quadrilaterals• Identify and/or use properties of regular polygons• Solve for the sum of the angles in a polygon
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Unit: Transformations

Know:

Understand:

Do:

<p>CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• The rules to transform a figure• symmetry	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Transform a figure• Write a rule given a transformation• Identify line, point and rotational symmetry
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Unit: Similar + Right Triangles

Know:

Understand:

Do:

<p>CC.2.3.HS.A.7 - Apply trigonometric ratios to solve problems involving right triangles.</p> <p>CC.2.3.8.A.3 - Understand and apply the Pythagorean Theorem to solve problems.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none">• How to prove triangles are similar• Application of ratios• Relationships between similar figures• How to solve for sides and angles in right triangles• How to solve for sides and angles in oblique triangles	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none">• Identify and/or use proportional relationships in similar figures.• Use the Pythagorean theorem to write and/or solve problems involving right triangles.• Use trigonometric ratios to write and/or solve problems involving right triangles.• Use special right triangles to solve problems involving right triangles• Identify similar triangles• Solve oblique triangles using law of sines and law of cosines
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Unit: Volume + Surface Area

Know:

Understand:

Do:

<p>CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.</p> <p>CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures.</p> <p>CC.2.3.8.A.1 - Apply the concepts of volume of cylinders, cones, and spheres to solve real world and mathematical problems.</p> <p>CC.2.3.HS.A.12 - Explain volume formulas and use them to solve problems.</p> <p>CC.2.3.HS.A.14 - Apply geometric concepts to model and solve real world problems.</p>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> ● Vocabulary related to three-dimensional figures ● Formulas for surface area and volume ● Effects of dimensional change 	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Identify and/or use the properties of a sphere or cylinder. ● Identify and/or use properties of pyramids and prisms. ● Identify and/or use properties of congruent and similar polygons or solids. ● Find the measurement of a missing length, given the perimeter, circumference, or area. ● Develop and/or use strategies to find the area of a compound/composite figure. ● Describe how a change in the linear dimension of a figure affects its perimeter, circumference, and area ● Calculate the surface area of prisms, cylinders, cones, pyramids, and/or spheres. ● Calculate the volume of prisms, cylinders, cones, pyramids, and/or spheres. ● Find the measurement of a missing length given the surface area or
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		<p>volume.</p> <ul style="list-style-type: none">• Describe how a change in the linear dimension of a figure affects its surface area or volume
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Unit: Circles

Know:

CC.2.3.HS.A.8 - Apply geometric theorems to verify properties of circles.

CC.2.3.HS.A.9 - Extend the concept of similarity to determine arc lengths and areas of sectors of circles.

CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.

Understand:

Students will understand...

- Circles and their parts
- The different ways circles and their parts can be measured
- The relationships between circle parts
- The equation of a circle

Do:

Students will be able to...

- Identify, determine, and/or use the radius, diameter, segment, and/or tangent of a circle.
- Identify, determine, and/or use the arcs, semicircles, sectors, and/or angles of a circle.
- Use chords, tangents, and secants to find missing arc measures or missing segment measures.
- Find the area of a sector of a circle.
- Find the length of an arc of a circle
- Write and identify equations of circles on the coordinate plane

Pacing Guide

Course:

Course Unit (Topic Periods)	Length of Instruction (Class
Geometry Basics	7 days
Logic + Proof	9 days
Parallel + Perpendicular Lines	8 days
Congruence and Relationships with Triangles	12 days
Polygons + Quadrilaterals	9 days
Transformations	4 days
Similar + Right Triangles	11 days
Volume + Surface Area	11 days
Circles	9 days