Honors Geometry

Curriculum Guide

Scranton School District

Scranton, PA

Updated 2022-2023

Course Title Here

Prerequisite :

- Successful completion of Algebra I, Honors Algebra I, or Algebra I Accelerated
- Be in compliance with the SSD Honors and AP Criteria Policy

Intended Audience: This course is designed for the student who has successfully completed Algebra I by the end of the 8th or 9th grade.

Honors Geometry follows Honors Algebra I, and is designed to emphasize the study of the properties and applications of common two and three dimensional geometric figures. The honors class is taught at a faster pace, thus allowing time for more difficult problems and concepts. This course formalizes what students have learned about geometry in the middle grades, with a concentration on mathematical reasoning and formal proofs. Topics covered focus on the Pennsylvania Core Standards and are parallel to the Geometry 9 and 10 courses, presenting all the same major topics except with more rigor.

After successfully completing the course, students will be allowed to enroll in Honors Algebra II/ Trigonometry or Algebra II/Trigonometry.

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Curriculum Guide

Year-at-a-glance

Subject: Honors Geometry	**Grade Level: 9th and 10th**	**Date Updated: 9/28/2022**

1st Quarter

Topic	Resources	CCSS
Basic Terms and Coordinate Geometry	Big Ideas Geometry 1.1-1.3 McGraw Hill Reveal Geometry 1-1 to 1-4, 1-7	G.2.1.2.1, G.2.1.2.2, G.2.1.2.3
Perimeter and Area in the Coordinate Plane	Big Ideas Geometry 1.4 McGraw Hill Reveal Geometry 1-4, 2-3	G.2.2.2.1, G.2.2.2.2, G.2.2.2.4, G.2.2.2.5, G.2.2.3.1, G.2.2.4.1
Angles	Big Ideas Geometry 1.5-1.6, 5.1, 7.1 McGraw Hill Reveal Geometry 2-1, 2-2, 5-1, 7-1	G.2.2.1.1, G.2.2.1.2, G.1.2.1.4
Parallel and Perpendicular Lines	Big Ideas Geometry 3.1-3.5 McGraw Hill Reveal Geometry 3-7, 3-8, 3-9	G.2.2.1.2, G.2.1.2.2

2nd Quarter

Topic	Resources	CCSS
Reasoning and Proof	Big Ideas Geometry 2.4-2.6, 3.3, 3.4 McGraw Hill Reveal Geometry 3-1 to 3-6	G.1.3.2.1
Congruent Triangles	Big Ideas Geometry 5.2-5.7, McGraw Hill Reveal Geometry 5-2 to 5-6	G.1.2.1.1, G.1.2.1.3, G.1.3.1.1, G.1.3.2.1
Relationships Within Triangles	Big Ideas Geometry 6.1, 6.3-6.5, 5.8 McGraw Hill Reveal Geometry 6-1 to 6-7, 5-7	G.1.2.1.1

3rd Quarter

Topic	Resources	CCSS
Similar Triangles	Big Ideas Geometry 8.1-8.4 McGraw Hill Reveal Geometry 8-2 to 8-6	G.1.3.1.2, G.1.3.1.1
Right Triangles and Trigonometry	Big Ideas Geometry 9.1-9.5 McGraw Hill Reveal Geometry 9-1, 9-2, 9-4 to 9-6	G.2.1.1.1, G.2.1.1.2
Quadrilaterals and Their Area	Big Ideas Geometry 7.2-7.5 McGraw Hill Reveal Geometry 7-2 to 7-6, 11-1	G.2.1.2.3, G.1.2.1.2, G.2.2.2.2, G.2.2.2.3, G.2.2.3.1

4th Quarter

Topic	Resources	CCSS
Circles	Big Ideas Geometry 10.1-10.6 McGraw Hill Reveal Math 10-1 to 10-6	G.1.1.1.1, G.1.1.1.2, G.1.1.1.3
Circumference, Area, and Volume	Big Ideas Geometry 11.1, 11.2, 11.4-11.8 McGraw Hill Reveal Math 11-2 to 11-4, 11-6, 11-7, 12-3	G.1.1.1.2, G.2.2.2.5, G.1.1.1.4, G.1.2.1.5, G.2.3.1.1, G.2.3.1.2, G.2.3.1.3, G.2.3.2.1, G.2.2.4.1
Final Review		

General Topic	Academic Standard(s)	Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time
Basic Terms And Coordinate Geometry	**G.2.1.2.1 Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane.**	*Name points, lines, planes, segments, and rays. Use the Ruler and Segment Addition Postulate.* *Relate distance formula to Pythagorean Theorem.* *Use distance and midpoint formulas.*	**Big Ideas Geometry 1.1 – 1.2** **Reveal Geometry 1-1, 1-2, 1-3** **Big Ideas Geometry 1.3** **Reveal Geometry 1-4, 1-7**	**Formative and summative assessments both formal and informal will be given.** **Students will have individual work and group work.** **May include but is not limited to teacher prepared tests, quizzes, etc.** **Series available assessments online. (Optional)**	**12 days**

Perimeter and Area in the Coordinate Plane	**G.2.2.2.1 Estimate area, perimeter or circumference of an irregular figure.** **G.2.2.2.4 Develop and/or use strategies to estimate the area of a compound/ composite figure.**	*Use area, perimeter, and circumference formulas in the coordinate plane.*	**Big Ideas Geometry 1.4** **Reveal Geometry 1-4, 2-3** **http://shodor.org/interactivate-java/activities/ShapeBuilder/**		**8 days**
Angles		*Name, measure and classify angles. Identify congruent angles.*	**Big Ideas Geometry 1.5** **Reveal Geometry 2-1**		**10 days**

	G.2.2.1.1 Use properties of angles formed by intersecting lines to find the measures of missing angles.	*Understand and solve problems using Complementary, Supplementary, and Vertical Angles.*	**Big Ideas Geometry 1.6** **Reveal Geometry 2-2**		
	G.1.2.1.1 Identify and/or use properties of triangles.	*Understand and solve problems using Triangle Sum and Exterior Angle Theorems.*	**Big Ideas Geometry 5.1** **Reveal Geometry 5-1**		
	G.1.2.1.4 Identify and/or use properties of regular polygons.	*Understand and solve problems using Interior and Exterior Angle Theorems.*	**Big Ideas Geometry 7.1** **Reveal Geometry 7-1** **http://illuminations.nctm.org/Activity.aspx?id=3546**		

Parallel and Perpendicular Lines	**G.2.2.1.2 Use properties of angles formed when two parallel lines are cut by a transversal to find the measures of missing angles.**	*Review and identify pairs of lines.* *Identify and use alternate interior angles, corresponding angles, alternate exterior angles, and consecutive interior angles to solve for missing angles.*	**Big Ideas Geometry 3.1** **Big Ideas Geometry 3.2-3.3** **Reveal Geometry 3-7**		**15 days**
	G.2.1.2.2 Relate slope to perpendicularity and/or parallelism (limit to linear algebraic equations).	*Identify parallel and perpendicular lines. Write equations of parallel and perpendicular lines.*	**Big Ideas Geometry 3.4-3.5** **Reveal Geometry 3-8**		

Reasoning and Proofs	**G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction.)**	*Use Algebraic Properties of Equality to justify the steps in solving an equation in a two-column proof.* *Use properties of equality involving segment lengths and angle measures to complete two-column proofs.* *Complete two-column proofs using parallel and perpendicular lines.*	**Big Ideas Geometry 2.4** **Big Ideas Geometry 2.5-2.6** **Reveal Geometry 3-1, 3-2, 3-3, 3-4** **Big Ideas Geometry 3.3-3.4** **Reveal Geometry 3-5, 3-6, 3-9**		**15 days**
Congruent Triangles	**G.1.3.1.1 Identify and/or use properties of congruent polygons or solids.**	*Identify and use corresponding parts.*	**Big Ideas Geometry 5.2** **Reveal Geometry 5-2**		**20 days**

	G.1.2.1.3 Identify and/or use properties of isosceles and equilateral triangles.	*Use the Base Angles Theorems.*	**Big Ideas Geometry 5.4** **Reveal Geometry 5-6**		
	G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction).	*Proving triangles congruent using the SAS, SSS, HL, ASA and AAS Congruence Theorems.* *Using Congruent Triangles.* ***Increased emphasis on proofs including overlapping triangles, two pairs of congruent triangles, and isosceles/equilateral triangles.*	**Big Ideas Geometry 5.3, 5.5, 5.6** **Reveal Geometry 5-3, 5-4, 5-5** **http://www.lcps.org/cms/lib4/VA01000195/Centricity/Domain/1445/Geo%20G.6%20Chapter%204%20Congruent%20Triange%20Lab%20WS%20PDF.pdf** **Big Ideas Geometry 5.7**		

Relationships Within Triangles	**G.1.2.1.1 Identify and/or use properties of triangles.**	*Identify and/or use properties of medians, altitudes, and perpendicular bisectors.* *Use midsegments in the coordinate plane and the Triangle Midsegment Theorem to find distance.* *Use Triangle Inequality Theorem.*	**Big Ideas Geometry 6.1, 6.3** **Reveal Geometry 6-1, 6-2, 6-3** **Big Ideas Geometry 6.4** **Big Ideas Geometry 6.5** **Reveal Geometry 6-4, 6-6, 6-7**		**10 days**
	G.2.1.2.1 Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane.	*Use properties of triangles in coordinate proofs.*	**Big Ideas Geometry 5.8** **Reveal Geometry 5-7**		

Similar Triangles	**G.1.3.1.1 Identify and/or use properties of similar polygons or solids.** **G.1.3.1.2 Identify and/or use proportional relationships in similar figures.**	*Use the Triangle Similarity Theorems to solve real-life problems.*	**Big Ideas Geometry 8.1** **Big Ideas Geometry 8.2-8.3** **Reveal Geometry 8-2, 8-3** **Big Ideas Geometry 8.4** **Reveal Geometry 8-4, 8-5, 8-6**		**15 days**
Right Triangles and Trigonometry	**G.2.1.1.1 Use the Pythagorean Theorem to write and/or solve problems involving right triangles.**	*Find side lengths in special right triangles and solve real-life problems.* *Use the geometric mean to solve problems involving similar right triangles.*	**Big Ideas Geometry 9.1** **Big Ideas Geometry 9.2** **Reveal Geometry 9-1, 9-2** **Big Ideas Geometry 9.3** **Reveal Geometry 9-4**		**15 days**

	G.2.1.1.2 Use trigonometric ratios to write and/or solve problems involving right triangles.	*Use sine, cosine, and tangent to solve right triangles.*	**Big Ideas Geometry 9.4-9.5** **Reveal Geometry 9-5, 9-6** **http://en.wikibooks.org/wiki/High_School_Trigonometry/Applications_of_Right_Triangle_Trigonometry** **http://jwilson.coe.uga.edu/emt668/emat6680.folders/brooks/6690stuff/righttriangle/Applications.html**		
Quadrilaterals And Their Areas	**G.1.2.1.2 Identify and/or use properties of quadrilaterals.**	*Identify parallelograms, rectangles, squares, and trapezoids using their properties.* *Include proofs using properties of quads and proofs determining type of special quadrilateral.* *Use properties of trapezoids and the Trapezoid Midsegment Theorem to find distances.*	**Big Ideas Geometry 7.2, 7.4, 7.5** **Reveal Geometry 7-2, 7-3, 7-4, 7-5** **http://illuminations.nctm.org/Lesson.aspx?id=1992** **Big Ideas Geometry 7.5** **Reveal Geometry 7-6**		**15 days**

	G.2.1.2.3 Use slope, distance and/or midpoint between 2 points on a coordinate plane to establish properties of a 2-dimensional shape.	*Coordinate Geometry used to identify types of quadrilaterals.*	**Big Ideas Geometry 7.3, 7.4** **Reveal Geometry 11-1**		
	G.2.2.2.2 Find the measurement of a missing length given the perimeter, circumference, or area.	*Use formulas for quadrilaterals.*	**Teacher created materials.**		
	G.2.2.2.3 Find the side lengths of a polygon with a given perimeter to maximize the area of the polygon.	*Use formulas for quadrilaterals.*	**http://map.mathshell.org/materials/download.php?fileid=1226**		

	G.2.2.3.1 Describe how a change in the linear dimension of a figure affects its perimeter, circumference, and area.	*How does changing the length of the radius of a circle affect the circumference of the circle?* *Use formulas for quadrilaterals.*	**Teacher created materials.**		
Circles	**G.1.1.1.1 Identify, determine and/or use the radius, diameter, segment and/or tangent of a circle.**	*Find missing measures using segments related to circles.* *Include proofs using properties of circles.*	**Big Ideas Geometry 10.1** **Reveal Geometry 10-1** **http://illuminations.nctm.org/uploadedFiles/Content/Lessons/Resources/9-12/PiLine-AS-Slope.pdf**		**15 days**
	G.1.1.1.2 Identify, determine and/or use the arcs, semicircles, sectors, and/or angles of a circle.	*Find arc measures.*	**Big Ideas Geometry 10.2** **Reveal Geometry 10-2**		

	G.1.1.1.3 Use chords, tangents, and secants to find missing arc measures or missing segment measures.	*Use Chord Theorems to find lengths and arc measures.* *Use inscribed angles and inscribed polygons to find angle and arc measures.* *Use circumscribed angles to find angle and arc measures.* *Use chords, tangents, and secants to find missing segment measures.*	**Big Ideas Geometry 10.3** **Reveal Geometry 10-3** **Big Ideas Geometry 10.4** **Reveal Geometry 10-4** **Big Ideas Geometry 10.5** **Reveal Geometry 10-5** **Big Ideas Geometry 10.6** **Reveal Geometry 10-6** **http://illuminations.nctm.org/Lesson.aspx?id=2417**		

Circumference, Area, and Volume	**G.1.1.1.2 Identify, determine and/or use the arcs, semicircles, sectors, and/or angles of a circle.**	*Find circumference and use arc length to find measures and solve real-life problems.*	**Big Ideas Geometry 11.1** **Reveal Geometry 11-2**		**20 days**
	G.2.2.2.5 Find the area of a sector of a circle.	*Find the area of a sector of a circle.*	**Big Ideas Geometry 11.2** **Reveal Geometry 11-3**		
	G.1.2.1.5 Identify and/or use the properties of pyramids and prisms. **G.1.1.1.4 Identify and/or use the properties of a sphere or cylinder.**	*Include Pythagorean Theorem and Special Right Triangles when finding missing measures.*	**Big Ideas Geometry 11.4** **Reveal Geometry 11-6, 11-7**		

	G.2.3.1.2 Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres.	*Solve problems using Volume. Formulas are provided on the reference sheet.*	**Big Ideas Geometry 11.5-11.8** **Reveal Geometry 11-6, 11-7** **http://intermath.coe.uga.edu/tweb/gwin1-01/luce/SAV/SAVRes.html**		
	G.2.3.1.1 Calculate the surface area of prisms, cylinders, cones, pyramids and/or spheres.	*Solve problems using Surface Area. Formulas are provided on the reference sheet*.	**Big Ideas Geometry 11.7-11.8** **Reveal Geometry 11-4** **http://www.mybookezzz.org/surface-area-hands-on-activity/**		
	G.2.3.1.3 Find the measurement of a missing length given the surface area or volume.	*Formulas are provided on the reference sheet*.	**http://illuminations.nctm.org/Lesson.aspx?id=2911**		

	G.2.3.2.1 Describe how a change in the linear dimension of a figure affects its surface area or volume.	*How does changing the length of the edge of a cube affect the volume of the cube?*	**http://www.shodor.org/interactivate/lessons/SurfaceAreaAndVolume/** **http://www.k12.wa.us/mathematics/MathAve/Landscaping/Assessment.pdf**		
	G.2.2.4.1 Use area models to find probabilities.	*Use probabilities to make fair decisions.* *Analyze decisions and strategies using probability concepts.*	**Reveal Geometry 12-3**		
Revisit, Review, and Reteach skills not mastered through small group instruction, cooperative leaning, and peer coaching					**10 days**
				Total Days:	**180**