



**PASSAIC COUNTY TECHNICAL INSTITUTE**  
45 Reinhardt Road  
Wayne, NJ

# **Geometry Curriculum**

**Course # 0062,0065**

**5 Credits**

**2017**

## I. Course Description

Moving towards formal mathematical arguments, the standards presented in this high school geometry course are meant to formalize and extend middle grades geometric experiences. This course includes an in-depth analysis of plane, solid, and coordinate geometry as they relate to both abstract mathematical concepts as well as real-world problem situations. Topics include logic and proof, parallel and perpendicular lines, polygons, perimeter and area analysis, volume and surface area analysis, similarity and congruence, trigonometry, and analytic geometry. Emphasis will be placed on developing critical thinking skills as they relate to logical reasoning and argument. Students will be required to use different technological tools and manipulatives to discover and explain much of the course content. Algebra I skills are used throughout the course. The standards in this course continue the work of modeling situations.

## II. PCTI Curriculum Unit Planner

### Unit 1

<b>Content Area:</b>	<b>Geometry</b>	<b>Grade(s)</b>	<b>9, 10, &amp; 11</b>
<b>Unit Plan Title:</b>	<b>Unit 1 – Trigonometry, Fundamental Geometric Concepts, and Construction</b>		
	<i>The application of properties of special right triangles and trigonometric ratios to find unknown side lengths and angle measures will extend to the development of the unit circle. The development of the Laws of Sines and Cosines will be used to find missing measures of triangles in general, not just right triangles. Previous knowledge of geometric terms will be formalized using precise definitions. Formal constructions will reinforce these definitions.</i>		

I. Right Triangles and Trigonometry (25 days)

1. Use Pythagorean Theorem to solve right triangles and the Converse of the Pythagorean Theorem to prove right triangles.
2. Use special relationships in right triangles to find unknown side lengths and angle measures.
3. Use trigonometric ratios to solve right triangles in applied problems.
4. Apply the Law Sines and Law of Cosines to find measures of triangles in general.
5. Use special right triangles properties and trigonometric ratios to develop the unit circle.
6. Understand the radian unit to measure an angle.

II. Essentials of Geometry (20 days)

1. Describe geometric figures.
2. Measure geometric figures.
3. Understand the difference between equality and congruence.
4. Make formal geometric constructions with a variety of tools and methods to bisect line segments and angles.

**NJSLS Standard(s) Addressed in this unit**

F-TF.A.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

G-COA.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

G-CO.B.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

G-CO.C.9 Prove theorems about lines and angles. *Theorems include: vertical angles are congruent, when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent, points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*

G-CO.C.10 Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to  $180^\circ$ , base angles of isosceles triangles are congruent, the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length, the medians of a triangle meet at a point.*

G-CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment, copying an angle, bisecting a segment, bisecting an angle, constructing perpendicular lines, including the perpendicular bisector of a line segment, and constructing a line parallel to a given line through a point not on the line.*

G-GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

G-MG.A.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost, working with typographic grid systems based on ratios).

G-SRT.B.4 Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely, the Pythagorean Theorem proved using triangle similarity.*

G-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G-SRT.C.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

G-SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles..

G-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G-SRT.D.9 Derive the formula  $A = \frac{1}{2} ab \sin(C)$  for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

G-SRT.D.10 Prove the Laws of Sines and Cosines and use them to solve problems.

G-SRT.D.11 Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

### Essential Questions (3-5)

1. How do you use the Pythagorean Theorem to find missing lengths on a right triangle?
2. How can the sine, cosine, and tangent ratios be used to find indirect measurement of triangles?
3. Is there a method that can be used to find the angle measures and side lengths of nonright triangles?

4. How do the sine, cosine, and tangent ratios relate to the unit circle?
5. What is the difference between radian and degree angle measure?

### Anchor Text

***Holt McDougal Larson Geometry (Common Core Edition)***

Authors : Ron Larson, Laurie Boswell, Timothy D. Kanold, Lee Stiff

Houghton Mifflin Harcourt Publishing Company

Copyright Date: 2012

ISBN: 978-0-547-64714-2

### Informational Texts (3-5)

***Geometry with Applications and Proofs: Advanced Geometry for Senior High School, Student Text and Background Information***, 2014, Aad Goddijn, Martin Kindt, Wolfgang Reuter, Sense Publishers, ISBN-13: 9789462098589.

***A High School First Course in Euclidean Plane Geometry***, 2010, Charles H. Aboughantous, Universal-Publishers, ISBN-13: 9781627341370

***High School Math CME Common Core Geometry***, 2013, Prentice Hall, ISBN-13: 9781256741480

### Short Texts (1-3)

***Barrons Review Course Series: Let's Review Geometry***, 2016, Andre Castagna, Barron's Educational Series, ISBN-13: 9781438007021.

***Parcc Success Strategies High School Geometry, 2016***, PARCC Exam Secrets Test Prep Staff Mometrix Media LLC , ISBN-13: 9781630947101.

### Formative & Summative Assessments

### Formative Assessment

- Homework
- Quiz
- Chapter test
- Classwork

### Summative Assessment

- Marking Period Pre Test
- Marking Period Post Test
- Project
- Final Exam

### **Resources (websites, Canvas, LMS, Google Classroom, documents, etc.)**

TI 84 Plus Calculator

TI Nspire Graphing Calculator

Excel

Canvas

Google Classroom

<https://www.geogebra.org/>

<https://www.khanacademy.org/math/geometry>

<https://www.desmos.com/calculator>

<http://www.onlinemathlearning.com/sat-practice-questions-geometry-1.html>

<http://www.state.nj.us/education/cccs/2016/math/standards.pdf>

<http://www.state.nj.us/education/cccs/2014/tech/>

<https://my.hrw.com/>

<http://mathbits.com/MathBits/TeacherResources/Geometry/Geometry.htm>

**Suggested Time Frame:** 45 Days

## Unit 2

<b>Content Area:</b>	<b>Geometry</b>	<b>Grade(s)</b>	<b>9, 10, &amp; 11</b>
<b>Unit Plan Title:</b>	<b>Unit 2 – Proofs, Angles, Parallel and Perpendicular Lines, and Construction</b>  <i>Various formats will be used to construct proofs and make logical arguments about lines and angles. Theorems will be derived and applied from properties of parallel and perpendicular lines and the angles that are formed by</i>		

*their intersections. Parallel and perpendicular lines will be created using formal constructions that utilize a variety of tools and methods.*

I. Reasoning and Proof (20 days)

1. Use inductive and deductive reason.
2. Understand geometric relationships in diagrams.
3. Write proofs about geometric relationships between angles and lines.

II. Parallel, Perpendicular Lines and Constructions (25 days)

1. Use properties of parallel and perpendicular lines.
2. Prove relationships using angle measures.
3. Make connections to lines in algebra.
4. Make formal geometric constructions with a variety of tools and methods to construct parallel and perpendicular lines.

**NJSLS Standard(s) Addressed in this unit**

G-CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

G-CO.C.9 Prove theorems about lines and angles. *Theorems include: vertical angles are congruent, when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent, points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*

G-CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment, copying an angle, bisecting a segment, bisecting an angle, constructing perpendicular lines, including the perpendicular bisector of a line segment, and constructing a line parallel to a given line through a point not on the line.*

G-GPE.B.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

G.SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Mathematical Practices:

SMP3 Construct viable arguments and critique the reasoning of others.

### Essential Questions (3-5)

1. In what type of scenarios would you use inductive or deductive reasoning?
2. How can reasoning be used to verify a conclusion?
3. How can you use properties of algebra to solve an equation?
4. What are the relationships among the angles formed by two parallel lines and a transversal?
5. How can you verify the slopes of parallel and perpendicular lines?

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#### Summative Assessment

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<http://www.state.nj.us/education/cccs/2016/math/standards.pdf>

<http://www.state.nj.us/education/cccs/2014/tech/>

<https://my.hrw.com/>

**Suggested Time Frame:**

45 Days

## Unit 3

<b>Content Area:</b>	<b>Geometry</b>	<b>Grade(s)</b>	<b>9, 10, &amp; 11</b>
<b>Unit Plan Title:</b>	Unit 3 – Circles, Triangle Relationships, and Similarity		
	<p><i>Segment and angle relationships with respect to circles and the use of a rectangular coordinate system to verify geometric properties and to solve geometric problems will be established. Concepts of similarity will be used to establish the relationship among segments on chords, secants and tangents as well as to prove basic theorems about circles. Triangle congruence conditions will be proven and the concept of similarity will be used to find indirect measure in figures.</i></p> <p>I. Circles (20 days)</p> <ol style="list-style-type: none"><li>1. Use properties of segments, lines, and rays that intersect circles</li><li>2. Find arc measure.</li><li>3. Apply angle relationships in circles</li><li>4. Use circles in the coordinate plane.</li><li>5. Write and graph equations of circles.</li></ol> <p>II. Triangle Relationships (14 days)</p> <ol style="list-style-type: none"><li>1. Classify triangles by sides and angles.</li><li>2. Prove triangles are congruent.</li><li>3. Apply properties of isosceles and equilateral triangles.</li><li>4. Use coordinate geometry to investigate triangle relationships.</li></ol> <p>III. Similarity (11 days)</p> <ol style="list-style-type: none"><li>1. Use ratios and proportions to solve geometry problems.</li><li>2. Show triangles are similar.</li><li>3. Use indirect measurement and similarity.</li></ol>		

## NJSLS Standard(s) Addressed in this unit

- G-C.A.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles, inscribed angles on a diameter are right angles, the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*
- G-C.A.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
- G-C.A.4 Construct a tangent line from a point outside a given circle to the circle.
- G-C.B.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality, derive the formula for the area of a sector.
- G-CO.A.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- G-CO.A.2 Represent transformations in the plane using, e.g., transparencies and geometry software, describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
- G-CO.B.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
- G-CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
- G-CO.C.10 Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to  $180^\circ$ , base angles of isosceles triangles are congruent, the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length, the medians of a triangle meet at a point.*
- G-CO.D.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment, copying an angle, bisecting a segment, bisecting an angle, constructing perpendicular lines, including the perpendicular bisector of a line segment, and constructing a line parallel to a given line through a point not on the line.*

G-CO.D.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

G-GPE.A.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem, complete the square to find the center and radius of a circle given by an equation.

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

G-MG.D.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

G-SRT.B.3 Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

G-SRT.B.4 Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely, the Pythagorean Theorem proved using triangle similarity.*

G-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

### Essential Questions (3-5)

1. When lines intersect a circle, or within a circle, how do you find the measures of resulting angles, arcs, and segments?
2. How do you identify corresponding parts of congruent and similar triangles?
3. How do you show that two triangles are congruent?
4. How do you use proportions to find side lengths in similar polygons?
5. How do you show two triangles are similar?

### Anchor Text

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### Resources (websites, Canvas, LMS, Google Classroom, documents, etc.)

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<http://www.state.nj.us/education/cccs/2014/tech/>

<https://my.hrw.com/>

**Suggested Time Frame:** 45 Days

## Unit 4

<b>Content Area:</b>	<b>Geometry</b>	<b>Grade(s)</b>	<b>9, 10, 11</b>
<b>Unit Plan Title:</b>	<p data-bbox="373 215 1255 253"><b>Unit 4 – Transformations, Quadrilaterals, and Area and Volume</b></p> <p data-bbox="373 285 1814 448"><i>The concepts of congruence and similarity of plane figures will be applied to the understanding of rigid and nonrigid transformations. Classification of quadrilaterals and their properties will be expanded on and applied. Extension of previous understandings of two- dimensional objects will be applied to three-dimensional objects. Formal explanations of circumference, area and volume formulas will be analyzed and calculated.</i></p> <ol data-bbox="422 505 1367 1260" style="list-style-type: none"> <li data-bbox="422 505 821 537">I. Transformations (16 days) <ol data-bbox="470 548 1188 716" style="list-style-type: none"> <li data-bbox="470 548 869 581">1. Apply vectors in geometry.</li> <li data-bbox="470 592 1079 625">2. Perform rigid and nonrigid transformations.</li> <li data-bbox="470 636 1188 669">3. Relate congruence and similarity to transformations.</li> <li data-bbox="470 680 1068 712">4. Make real-world connections to symmetry.</li> </ol> </li> <li data-bbox="422 776 800 808">II. Quadrilaterals (13 days) <ol data-bbox="470 820 1367 1036" style="list-style-type: none"> <li data-bbox="470 820 758 852">1. Classify polygons.</li> <li data-bbox="470 863 989 896">2. Use angle relationships in polygons.</li> <li data-bbox="470 907 884 940">3. Use properties of polygons.</li> <li data-bbox="470 951 1062 984">4. Classify quadrilaterals by their properties.</li> <li data-bbox="470 995 1367 1027">5. Use coordinate geometry to investigate quadrilateral relationships.</li> </ol> </li> <li data-bbox="422 1089 1119 1122">III. Measurement of Plane and Solid Figures (16 days) <ol data-bbox="470 1133 1276 1260" style="list-style-type: none"> <li data-bbox="470 1133 1276 1166">1. Compare measures for parts of circles and the whole circle.</li> <li data-bbox="470 1177 1125 1209">2. Solve problems using surface area and volume.</li> <li data-bbox="470 1221 879 1253">3. Connect similarity to solids.</li> </ol> </li> </ol>		
<b>NJSLS Standard(s) Addressed in this unit</b>			
G.C.A.1 Prove that all circles are similar.			

- G-C.B.5 Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality, derive the formula for the area of a sector.
- G-CO.A.2 Represent transformations in the plane using, e.g., transparencies and geometry software, describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
- G-CO.A.3 Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
- G-CO.A.4 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
- G-CO.A.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
- G.CO.B.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure, given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
- G.CO.B.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
- G.CO.C.11 Prove theorems about parallelograms. *Theorems include: measures of interior angles of a triangle sum to  $180^\circ$ , base angles of isosceles triangles are congruent, the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length, the medians of a triangle meet at a point.*
- G-CO.D.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
- G-GMD.A.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
- G-GMD.A.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
- G-GMD.B.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
- G-GPE.B.4 Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle, prove or disprove that the point  $(1, \sqrt{3})$  lies on the circle centered at the origin and containing the point  $(0, 2)$ .*
- G-GPE.B.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems. (E.g. find the equation of a line parallel or perpendicular to a given line that passes through a given point.
- G-GPE.B.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.
- G-MG.A.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

G-MG.A.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

G-MG.A.3 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

G-SRT.A.1 Verify experimentally the properties of dilations given by a center and a scale factor.

- a) A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
- b) The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

G-SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar, explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

G-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.\*

### Essential Questions (3-5)

1. What are the four basic types of transformations?
2. How do you classify/name quadrilaterals?
3. How do you solve problems algebraically using the properties of quadrilaterals?
4. How are the perimeter and area of similar figures and similar solids related?
5. How do you calculate arc length, sector area, surface area and volume of various prisms, cones, cylinders and spheres?

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**Suggested Time Frame:**

45 Days

### **III. Instructional Strategies**

- Lecture
- Graphs and other visuals
- Student investigative activities
- Engaging in discussions
- Reading silently and aloud
- Brainstorming
- Listening
- Participating in small and large groups
- Collaborative projects
- Answering questions (oral and written)
- Summarizing
- Debating
- Analyzing data, discussions, etc.
- Peer teaching
- Playing games
- Note taking
- Writing

#### **Differentiated Instruction**

- Students will work individually, engage in cooperative learning, and utilize discovery learning on certain activities. Through the use of lectures, the internet, and interactive whiteboards, students will be exposed to various teaching methods to appeal to visual, auditory, and kinesthetic learners. Students will be given copies of data sets and other important notes.

#### **IV. Methods of Student Evaluation:**

Assessment can be divided into two general categories: formal (graded) and informal/classroom-based (both graded and ungraded). The key to effectively assessing a student's mastery of skills is to match the assessment method to the learning objective.

##### Formal Assessments

- Homework and classwork assignments
- Reports and presentations
- Technological applications
- Multiple choice assessment
- Quizzes
- Projects
- Short answer and problem solving assessment
- Tests
- Investigative task

##### Informal Assessments

- Instructor's observations of note-taking, and organization of notebooks and assignments
- Class Participation
- Cooperative learning activities
- Observing citizenship and appropriate social responses
- Instructor's observations of time management skills

## V. Scope and Sequence

Key: I – Introduced, D-developed in Depth, R-Reinforced

<b>Skill/Concepts to be Learned</b>	<b>9</b>	<b>10</b>	<b>11</b>
Solves practical problems and develops the unit circle involving right triangles by using the Pythagorean Theorem, properties of special right triangles, and right triangle trigonometry.	IDR	IDR	IDR
Formalizes knowledge of geometric terms by using precise definitions	IDR	IDR	IDR
Construct and judge the validity of a logical argument consisting of a set of premises and a conclusion.	IDR	IDR	IDR
Uses algebraic, coordinate, and deductive methods to solve problems involving parallel and perpendicular lines and distance and midpoint formulas.	IDR	IDR	IDR
Investigates and identifies properties of circles.	IDR	IDR	IDR
Applies congruence correspondences and properties of the figures to find missing parts of geometric figures and provide logical justification	IDR	IDR	IDR
Applies similarity correspondences and properties of the figures to find missing parts of geometric figures and provide logical justification.	IDR	IDR	IDR
Applies the concepts of congruence and similarity of plane figures to the understanding of rigid and nonrigid transformations.	IDR	IDR	IDR
Investigates and identifies properties of quadrilaterals.	IDR	IDR	IDR

Uses formulas to solve practical problems involving perimeter, area, surface area, and volume and use appropriate units of measurement.	IDR	IDR	IDR
Reinforces definitions of geometric figures through formal constructions that utilize a variety of tools and methods.	IDR	IDR	IDR

## VI. Textbooks, Instructional Resources and Software

*Holt McDougal Larson Geometry (Common Core Edition)*; Authors : Ron Larson, Laurie Boswell, Timothy D. Kanold, Lee Stiff

<b>Resources for Students</b>	<b>Resources for Teachers</b>
<p><b>Digital</b></p> <p>Companion website: <a href="https://my.hrw.com/">https://my.hrw.com/</a></p> <p>Practice and Resources</p> <ul style="list-style-type: none"> <li>• Interactive Practice Test</li> <li>• Chapter Review Games</li> <li>• Chapter Project</li> <li>• Measurement and Data Handbook</li> <li>• Multi-Language Visual Glossary</li> <li>• Interactive Practice Quiz</li> <li>• Problem Solving Workshop</li> <li>• Study Guide</li> <li>• Investigating Geometry Activity</li> <li>• Real-Life Application</li> </ul> <p>Internet Resources</p> <ul style="list-style-type: none"> <li>• Multilingual Glossary</li> <li>• Graphing Calculator</li> <li>• Scientific Calculator</li> <li>• Online Student Edition</li> </ul> <p><b>Print</b></p> <p style="text-align: center;"><i>Holt McDougal Larson Geometry</i></p>	<p><b>Digital</b></p> <p>Companion website: <a href="https://my.hrw.com/">https://my.hrw.com/</a></p> <p>Resources</p> <ul style="list-style-type: none"> <li>• Lesson Plans</li> <li>• Teaching Guide</li> <li>• Solutions Key</li> <li>• Quick Catch-Up for Absent Students</li> <li>• Lesson Transparencies</li> <li>• PowerPoint Presentations</li> <li>• Study Guide</li> <li>• Tiered Student Practice</li> <li>• Chapter Project: Answers and Teacher’s Notes</li> </ul> <p>Assessment Resources</p> <ul style="list-style-type: none"> <li>• Quizzes, Chapter Tests</li> <li>• Standardized Chapter Test</li> <li>• SAT/ACT Chapter Test</li> <li>• Alternative Assessment</li> <li>• Cumulative Test</li> </ul>

<p><i>(Common Core Edition) Student Edition</i>); Authors : Ron Larson, Laurie Boswell, Timothy D. Kanold, Lee Stiff; ISBN: 978-0-547-64714-2</p>	<ul style="list-style-type: none"> <li>• End-of-Course Test</li> <li>• Remediation Book</li> <li>• Skills Readiness</li> </ul> <p>Internet Resources</p> <ul style="list-style-type: none"> <li>• Multilingual Glossary</li> <li>• Graphing/Scientific Calculator</li> <li>• Online Teacher Edition</li> </ul> <p><b>Print</b></p> <p><i>Holt McDougal Larson Geometry (Common Core Edition Annotated Instructor's Edition )</i>; Authors : Ron Larson, Laurie Boswell, Timothy D. Kanold, Lee Stiff; ISBN: 978-0-547-64708-1</p>
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## VII. Geometry Curriculum Correlation Chart with Textbook

Geometry Topic	Corresponding Text Sections
<b>I. Right Triangles and Trigonometry</b>	
1. Use Pythagorean Theorem to solve right triangles and the Converse of the Pythagorean Theorem to prove right triangles.	7.2, 7.2, 5.5
2. Use special relationships in right triangles to find unknown side lengths and angle measures.	7.4
3. Use special relationships in right triangles to find unknown side lengths and angle measures.	7.3, 7.4
4. Apply the Law Sines and Law of Cosines to find measures of triangles in general.	7.7
5. Use special right triangles properties and trigonometric ratios to develop the unit circle.	7.5, 7.6,
6. Understand the radian unit to measure an angle.	Teacher developed material
<b>II.Essentials of Geometry</b>	
1. Describe geometric figures.	1.1, 1.2, 1.5
2. Measure geometric figures.	1.3,1.4
3. Understand the difference between equality and and congruence.	1.2
4. Make formal geometric constructions with a variety of tools and methods to bisect line	1.4

segments and angles.

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### III. Reasoning and Proof

- |   |               |
|---|---------------|
| 1. Use inductive and deductive reason.                                  | 2.2, 2.5      |
| 2. Understand geometric relationships in diagrams.                      | 2.4, 2.6, 2.7 |
| 3. Write proofs about geometric relationships between angles and lines. | 2.4, 2.6, 2.7 |

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### IV. Parallel, Perpendicular Lines and Constructions

- |   |                    |
|---|--------------------|
| 1. Use properties of parallel and perpendicular lines.  | 3.1, 3.2, 3.3, 3.4 |
| 2. Prove relationships using angle measures.  | 3.2, 3.6           |
| 3. Make connections to lines in algebra.  | 3.2, 3.3, 3.4      |
| 4. Make formal geometric constructions with a variety of tools and methods to construct parallel and perpendicular lines. | 3.6                |

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### V. Circles

- |  |                  |
|--|------------------|
| 1. Use properties of segments, lines, and rays that intersect circles. | 10.1, 10.3, 10.6 |
| 2. Find arc measure.   | 10.2             |
| 3. Apply angle relationships in circles.                               | 10.4, 10.5       |
| 4. Use circles in the coordinate plane.                                | 10.7             |
| 5. Write and graph equations of circles.                               | 10.7             |

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### VI. Triangle Relationships

- |   |                              |
|---|------------------------------|
| 1. Classify triangles by sides and angles.                        | 4.1, 4.2                     |
| 2. Prove triangles are congruent.                                 | 4.4, 4.5, 4.6                |
| 3. Apply properties of isosceles and equilateral triangles.       | 4.8                          |
| 4. Use coordinate geometry to investigate triangle relationships. | 4.1, 4.2, 4.4, 4.5, 4.6, 4.7 |

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### VII. Similarity

- |   |                    |
|---|--------------------|
| 1. Use ratios and proportions to solve geometry problems. | 6.1                |
| 2. Show triangles are similar.                            | 6.3, 6.4           |
| 3. Use indirect measurement and similarity.               | 6.1, 6.3, 6.4, 6.5 |

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### VIII. Transformations

- |  |                         |
|--|-------------------------|
| 1. Apply vectors in geometry.                  | 9.1                     |
| 2. Perform rigid and nonrigid transformations. | 9.1, 9.3, 9.4, 9.5, 9.7 |

3. Relate congruence and similarity to transformations.	4.3, 6.2
4. Make real-world connections to symmetry.	9.6

### IX. Quadrilaterals

1. Classify polygons.	1.6
2. Use angle relationships in polygons.	8.1, 8.2, 8.3, 8.4, 8.5
3. Use properties of polygons.	8.1, 8.2, 8.3, 8.4, 8.5
4. Classify quadrilaterals by their properties.	8.3, 8.4, 8.5
5. Use coordinate geometry to investigate quadrilateral relationships.	8.2, 8.3, 8.4, 8.5

### X. Measurement of Plane and Solid Figures

1. Compare measures for parts of circles and the whole circle.	11.1, 11.2
2. Solve problems using surface area and volume.	11.3, 11.5, 11.6, 11.7, 11.8
3. Connect similarity to solids.	11.9

## VIII. Student Handout:

### Geometry Course Overview:

Moving towards formal mathematical arguments, the standards presented in this high school geometry course are meant to formalize and extend middle grades geometric experiences. This course includes an in-depth analysis of plane, solid, and coordinate geometry as they relate to both abstract mathematical concepts as well as real-world problem situations. Topics include logic and proof, parallel and perpendicular lines, polygons, perimeter and area analysis, volume and surface area analysis, similarity and congruence, trigonometry, and analytic geometry. Emphasis will be placed on developing critical thinking skills as they relate to logical reasoning and argument. Students will be required to use different technological tools and manipulatives to discover and explain much of the course content. Algebra I skills are used throughout the course. The standards in this course continue the work of modeling situations.

### Proficiencies:

#### I. *Right Triangles and Trigonometry*

- Use Pythagorean Theorem to solve right triangles and the Converse of the Pythagorean Theorem to prove right triangles.
- Use special relationships in right triangles to find unknown side lengths and angle measures.
- Use trigonometric ratios to solve right triangles in applied problems.



- Apply the Law of Sines and Law of Cosines to find measures of triangles in general.
- Use special right triangles properties and trigonometric ratios to develop the unit circle.
- Understand the radian unit to measure an angle.

## II. *Essentials of Geometry*

- Describe geometric figures.
- Measure geometric figures.
- Understand the difference between equality and congruence.
- Make formal geometric constructions with a variety of tools and methods to bisect line segments and angles.

## III. *Reasoning and Proof*

- Use inductive and deductive reason.
- Understand geometric relationships in diagrams
- Write proofs about geometric relationships between angles and lines.

## IV. *Parallel and Perpendicular Lines and Constructions*

- Use properties of parallel and perpendicular lines.
- Prove relationships using angle measures.
- Make connections to lines in algebra.
- Make formal geometric constructions with a variety of tools and methods to bisect line segments and angles.

## V. *Circles*

- Use properties of segments that intersect circles
- Find arc measure.
- Apply angle relationships in circles
- Use circles in the coordinate plane.
- Write and graph equations of circles.

## VI. *Triangle Relationships*

- Classify triangles by sides and angles.
- Prove triangles are congruent.
- Apply properties of isosceles and equilateral triangles.
- Use coordinate geometry to investigate triangle relationships.

## VII. *Similarity*

- Use ratios and proportions to solve geometry problems.
- Show triangles are similar.
- Use indirect measurement and similarity.

VIII. *Transformations*

- Apply vectors in geometry.
- Perform rigid and nonrigid transformations.
- Relate congruence and similarity to transformations.
- Make real-world connections to symmetry.

IX. *Quadrilaterals*

- Classify polygons.
- Use angle relationships in polygons.
- Use properties of polygons.
- Classify quadrilaterals by their properties.

X. *Measurement of Plane and Solid Figures*

- Compare measures for parts of circles and the whole circle.
- Solve problems using surface area and volume.
- Connect similarity to solids.