**COURSE DESCRIPTION**

**Course Title:** Geometry Honors

**Course Number:** 00251

**Course Prerequisites:** 80% or higher in Algebra II Honors

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| **Course Description:** | Geometry Honors is an academic course designed for the accelerated mathematics student planning on pursuing higher education; particularly those individuals whose primary interests are in mathematics. This course helps students recognize how algebra and geometry complement each other. In this course, students will learn various proof techniques and apply them to topics ranging from the basic elements of geometry to the areas and volumes of solids. Problems in this course will require higher level thinking skills and in- depth knowledge of the course content. This course is recommended for students planning on taking Calculus before graduating high school. |

**Suggested Grade Level**: Grade 10

**Length of Course:** Two Semesters

**Units of Credit:** 1

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:**

CSPG#50 Mathematics

To find the CSPG information, go to [CSPG](https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx)

**Certification verified by the WCSD Human Resources Department:** Yes No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Honors (.5) GPA +3%

**Mark Types:** Check all that apply.

F – Final Average MP – Marking Period EXM – Final Exam

**GPA Type**:  GPAEL-GPA Elementary  GPAML-GPA for Middle Level  NHS-National Honor Society

UGPA-Non-Weighted Grade Point Average  GPA-Weighted Grade Point Average

**State Course Code**: 02072

To find the State Course Code, go to [State Course Code](https://nces.ed.gov/forum/sced.asp), download the Excel file for *SCED*, click on SCED 6.0 tab, and chose the correct code that corresponds with the course.

**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

**Board Approved Textbooks, Software, and Materials:**

**Title:**  Geometry – A Common Core Curriculum

**Publisher:** Big Ideas Math

**ISBN #:**  978-1-64208-762-8

**Copyright Date:** 2019

**WCSD Board Approval Date:** 6/29/2020

**Supplemental Materials:** Geometry for Enjoyment and Challenge, McDougal and Littell Kutasoftware.com

**Curriculum Document**

**WCSD Board Approval:**

**Date Finalized:** 6/5/2020

**Date Approved:**  6/29/2020

**Implementation Year:** 2020-2021

**SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student’s Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

**SCOPE AND SEQUENCE OF CONTENT, CONCEPTS, AND SKILLS**

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| --- | --- | --- |
| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Month Taught and Assessed for Mastery** |
| Identify and name points, lines, planes, segments, and rays in a geometric diagram. | A.1 | September  Choose an item. |
| Sketch and name intersections lines and planes. | A.1 | September  Choose an item. |
| Solve real-life problems involving lines and planes. | A.1 | September  Choose an item. |
| Compare segments for congruence. | A.1, D.2 | September  Choose an item. |
| Use the Segment Addition Postulate to determine lengths of segments. | A.1, D.2 | September  Choose an item. |
| Determine the Midpoint of a segment using the Midpoint Formula. | D.12, B.7 | September  Choose an item. |
| Calculate the length of a segment using the Distance Formula. | D.12, B.7 | September  Choose an item. |
| Find lengths using midpoints and bisectors. | D.12, B.7 | September  Choose an item. |
| Classify polygons according the number of sides and whether they are concave or convex. | B.7, A.1 | September  Choose an item. |
| Find the perimeters and areas of polygons in the coordinate plane. | B.7, A.1 | September  Choose an item. |
| Name, measure, and classify angles. | A.1., D.12 | September  Choose an item. |
| Find the measures of angles using the Angle Addition Postulate. | A.1, D.12 | September  Choose an item. |
| Convert between degrees and degrees, minutes, and seconds forms. | A.1, D.12 | September |
| Bisect and trisect angles to find missing measures. | A.1, D.12 | September  Choose an item. |
| Identify complementary, supplementary, and vertical angles as well as linear pairs. | A.1, D.12 | September  Choose an item. |
| Write conditional statements. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Write the converse, inverse, and contrapositive of a conditional statement and determine their truth values. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Write biconditional statements. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Construct truth tables. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Use inductive and deductive reasoning to draw conclusions. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Sketch and interpret diagrams. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Identify methods of determining a plane. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Use Algebraic Properties of Equality to justify the steps in solving an equation. | C.9, C.10, C.11, B.4 | October  Choose an item. |
| Write two-column proofs to prove statements about segments and angles. | C.9 | October  Choose an item. |
| Use two-column proofs and paragraph proofs to prove geometric relationships. | C.9 | October  Choose an item. |
| Use the congruent complements theorem and the congruent supplements theorem to identify congruent angles and prove geometric relationships. | C.9 | October  Choose an item. |
| Identify parallel planes. | A.1 | October  November |
| Identify pairs of angles formed by transversals. | A.1 | October  November |
| Find measures of missing angles using properties of parallel lines. | C.9 | October  November |
| Prove theorems about parallel lines using angle theorems and their converses. | C.9, C.12 | October  November |
| Calculate the distance from a point to a line. | C.9, D.12 | October  November |
| Prove theorems about perpendicular lines. | C.9, D.12 | October  November |
| Solve real-life problems involving perpendicular lines. | C.9, D.12 | October  November |
| Identify parallel and perpendicular lines on a coordinate plane. | B.5, B.6 | October  November |
| Write equations of parallel and perpendicular lines. | B.5, B.6 | October  November |
| Use slope to find the distance from a point to a line. | B.5, B.6 | October  November |
| Perform translations and compositions and solve real life problems involving them. | A.2, A.4, A.5, B.6 | November  December |
| Perform reflections and glide reflections. | A.2, A.3, A.4, A.5, B.6, | November  December |
| Identify lines of symmetry. | A.2, A.3, A.4, A.5, B.6 | November  December |
| Perform rotations and compositions of them. | A.2, A.3, A.4, A.5, B.6 | November  December |
| Identify rotational symmetry. | A.2, A.3, A.4, A.5, B.6 | November  December |
| Describe congruence transformations and use their theorems to answer questions about a diagram. | A.5, B.6 | November  December |
| Identify and perform dilations. | A.5, B.6 | November  December |
| Perform and describe similarity transformations. | A.2, A.1 | November  December |
| Prove that triangles are similar. | A.2, A.5 | November  December |
| Classify triangles by sides and angles. | C.10, A.1 | December  January |
| Find interior and exterior angle measures of triangles. | C.10, A.1 | December  January |
| Identify and use corresponding parts to find missing measures in a diagram. | B.7 | December  January |
| Use the third angles theorem to find missing measures and complete proofs. | B.7 | December  January |
| Use the triangle congruence theorems to prove triangles congruent. | A.1, B.8 | December  January |
| Use properties of isosceles and equilateral triangles to find missing values and complete proofs. | A.1, C.10, D.13 | December  January |
| Use congruent triangles to solve real world application problems. | B.5 | December  January |
| Place figures in a coordinate plane. | B.4 | December  January |
| Write coordinate proofs. | B.4 | December  January |
| Use perpendicular bisectors to find measures. | A.1, C.9 | January  Choose an item. |
| Use angle bisectors to find measures and distance relationships. | A.1, C.9 | January  Choose an item. |
| Write equations for perpendicular bisectors. | A.1, C.9 | January  Choose an item. |
| Use medians and altitudes of triangles. | C.10 | January  Choose an item. |
| Use midsegments of triangles in the coordinate plane. | A.1, C.10 | January  Choose an item. |
| Use the triangle Midsegment Theorem to find distances. | A.1, C.10 | January  Choose an item. |
| Write indirect proofs. | C.10 | January  Choose an item. |
| List sides and angles of a triangle in order by size. | C.10 | January  Choose an item. |
| Use the Triangle Inequality Theorem to find possible side lengths of triangles. | C.10 | January  Choose an item. |
| Compare measures in triangles. | C.10 | January  Choose an item. |
| Solve real-life problems using the Hinge Theorem. | C.10 | January  Choose an item. |
| Use the interior and exterior angles of polygons to find missing measures. | C.11 | February  Choose an item. |
| Use properties to find side lengths and angles of parallelograms. | B.5, C.11 | February  Choose an item. |
| Identify and verify parallelograms. | A.1, B.5, C.11 | February  Choose an item. |
| Show that a quadrilateral is a parallelogram in the coordinate plane. | A.1, B.5, C.11 | February  Choose an item. |
| Use properties of special parallelograms to find side lengths and angles. | A.1, A.3, B.5, C.11 | February  Choose an item. |
| Use coordinate geometry to identify special types of parallelograms. | A.1, A.3, B.5, C.11 | February  Choose an item. |
| Use properties of trapezoids and kites to find side lengths and angles. | A.1, B.5 | February  Choose an item. |
| Use the Trapezoid Midsegment Theorem to find distances. | A.1, B.5 | February  Choose an item. |
| Use similarity statements. | A.2, A.3 | February  March |
| Find corresponding lengths in similar polygons. | A.2, A.3 | February  March |
| Find perimeters and areas of similar polygons. | A.2, A.3 | February  March |
| Decide whether polygons are similar. | A.2, A.3 | February  March |
| Use the Angle-Angle, Side-Side-Side, and Side-Angle-Side Theorems. | A.1, B.4, B.5 | February  March |
| Use the Triangle Proportionality Theorem and its converse. | B.4, B.5, B.6 | February  March |
| Use other proportionality theorems. | B.4, B.5, B.6 | February  March |
| Use the Pythagorean Theorem. | B.4, C.8 | March  April |
| Use the Converse of the Pythagorean Theorem. | B.4, C.8 | March  April |
| Classify triangles. | B.4, C.8 | March  April |
| Find side lengths in special right triangles. | A.1, C.8 | March  April |
| Solve real-life problems involving special right triangles. | A.1, C.8 | March  April |
| Identify similar triangles. | B.5 | March  April |
| Solve real-life problems involving similar triangles. | B.5 | March  April |
| Use geometric means. | B.5 | March  April |
| Use the tangent ratio. | C.6, C.8 | March  April |
| Solve real-life problems involving the tangent ratio. | C.6, C.8 | March  April |
| Use the sine and cosine of angle measures in special right triangles. | A.1, C.6, C.7, C.8 | March  April |
| Solve real-life problems involving since and cosine ratios. | C.6, C.7, C.8 | March  April |
| Use inverse trigonometric ratios. | A.1, A.3, C.8 | March  April |
| Solve right triangles. | A.1, A.3, C.8 | March  April |
| Find areas of triangles. | A.3, D.9, D.10, D.11 | March  April |
| Use the law of Sines and the Law of Cosines to solve triangles. | A.3, D.9, D.10. D.11 | March  April |
| Identify special segments and lines of circles. | A.1, A.2, A.4 | April  May |
| Draw and identify common tangents. | A.1, A.2, A.4 | April  May |
| Use properties of tangents. | A.1, A.2, A.4 | April  May |
| Find arc measures. | A.1, A.2 | April  May |
| Identify congruent arcs. | A.1, A.2 | April  May |
| Use chords of circles to find lengths and arc measures. | A.2, A.3 | April  May |
| Use inscribed angles. | A.2, A.3, D.13 | April  May |
| Use inscribed polygons. | A.2, A.3, D.13 | April  May |
| Find angle and arc measures. | A.2 | April  May |
| Use circumscribed angles. | A.2 | April  May |
| Use segments of chords, tangents, and secants. | A.1, A.2 | April  May |
| Write and graph equations of circles. | A.1, B.4 | April  May |
| Solve real-life problems using graphs of circles. | A.1, B.4 | April  May |
| Use the formula for circumference. | A.1, B.5 | May  June |
| Use arc lengths to find measures. | A.1, B.5 | May  June |
| Solve real-life problems. | A.1, B.5 | May  June |
| Measure angles in radians. | A.1, B.5 | May  June |
| Use the formula for area of a circle. | A.1, A.2, B.5 | May  June |
| Use the formula for population density. | A.1, A.2, B.5 | May  June |
| Find areas of sectors. | A.1, A.2, B.5 | May  June |
| Use areas of sectors. | A.1, A.2, B.5 | May  June |
| Find areas of rhombuses and kites. | A.3 | May  June |
| Find angle measures in regular polygons. | A.3 | May  June |
| Find areas of regular polygons. | A.3 | May  June |
| Classify solids. | B.4 | May  June |
| Describe cross sections. | B.4 | May  June |
| Sketch and describe solids of revolution. | B.4 | May  June |
| Find volumes of prisms and cylinders. | A.1, A.2, A.3 | May  June |
| Use the formula for density. | A.1, A.2, A.3 | May  June |
| Use volumes of prisms and cylinders. | A.1, A.2, A.3 | May  June |
| Find and use volumes of pyramids | A.1, A.3 | May  June |
| Find surface areas of right cones | A.1, A.3 | May  June |
| Find and use volumes of cones. | A.1, A.3 | May  June |
| Find surface areas and volumes of spheres. | A.1, A.2, A.3 | May  June |

**ASSESSMENTS**

**PSSA Academic Standards, Assessment Anchors, and Eligible Content:** The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

**Formative Assessments:** The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

**Effective formative assessments for this course include:** Formative assessments can include but are not limited to bell ringers, homework assignments, quizzes, projects, exit tickets, cooperative learning, observations, oral response, self-evaluation, and in-class assignments.

**Summative Assessments:** The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

**Effective summative assessments for this course include:** Summative assessments can include but are not limited to performance assessments, projects, tests, quizzes, and final exams.