WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Honors Geometry
Course Number: 00251
Course Prerequisites: Grade of 80% or higher in Algebra II Honors AND Proficient or Advanced on the Keystone Algebra Exam – OR – 85% or higher in Algebra II CP with teacher recommendation

Course Description: Honors Geometry 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. District marking period assessments are required.

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 (7-12)
To find the CSPG information, go to CSPG
Certification verified by the WCSD Human Resources Department: ☒Yes ☐No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Honors & Dual Enrollment (1) GPA +5%
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, download the Excel file for *SCED*, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title:	*Big Ideas Math – Geometry: A Common Core Curriculum*
Publisher:	Big Ideas Learning, LLC.
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, *enVisionmath 2.0 Grade 6:* SAVVAS Learning Company, LLC., *enVisionmath 2.0 Grade 7:* SAVVAS Learning Company, LLC., *enVisionmath 2.0 Grade 8:* SAVVAS Learning Company, LLC., Kuta Software, Get More Math, SAS pdesas.org, IXL, Brainfuse, Calculator: TI-30XIIS, Online Calculator: Desmos

Curriculum Document

WCSD Board Approval:

Date Finalized:	5/23/2022
Date Approved:	6/13/2022
Date(s) Revised:	6/12/2023
Implementation Year:	2022-2023

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, AND CONCEPTS

Marking Period 1: Perimeter, Circumference, and Area, Geometric Probability, Basics of Geometry, Postulates and Proofs, Parallel and Perpendicular Lines

- Perimeter, Circumference, and Area of Geometric Figures
- Probability of Non-Mutually Exclusive Events
- Points, Lines, and Planes
- Measurements of Segments
- Midpoint and Distance Formulas
- Perimeter and Area in the Coordinate Plane
- Measurements of Angles
- Angle Pairs
- Postulates
- Proofs of Segments and Angles
- Proofs of Geometric Relationships
- Pairs of Lines and Angles
- Parallel Lines and Transversals
- Proofs with Parallel and Perpendicular Lines
- Equations of Parallel and Perpendicular Lines
- **Marking Period 1 Review and Assessment**

Marking Period 2: Transformations, Congruent Triangles, and Relationships within Triangles

- Translations
- Reflections
- Rotations
- Congruence and Transformations
- Dilations
- Similarity and Transformations
- Angles of Triangles
- Congruent Polygons
- Proofs of Triangle Congruence: SAS, SSS, ASA, AAS, HL
- Equilateral and Isosceles Triangles
- Congruent Triangles
- Perpendicular and Angle Bisectors
- Bisectors of Triangles
- Definitions of Median and Altitude of a Triangle
- Triangle Midsegment Theorem
- Inequalities in One Triangle and Two Triangles
- **Marking Period 2 Review and Assessment**

Marking Period 3: Quadrilaterals and Other Polygons, Similarity, and Right Triangles

- Angles of Polygons
- Properties of Parallelograms
- Proofs: Quadrilaterals are Parallelograms
- Properties of Special Parallelograms
- Properties of Trapezoids and Kites
- Similar Polygons
- Proofs of Triangle Similarity: AA, SSS, SAS
- Proportionality Theorems
- Pythagorean Theorem
- Special Right Triangles
- Similar Right Triangles
- **Marking Period 3 Review and Assessment**

Marking Period 4: Trigonometry, Circles, and Circumference, Area, and Volume

- The Tangent, Sine and Cosine Ratios
- Inverse Trigonometric Ratios
- Right Triangle Solutions
- Lines, Segments, and Tangent Lines of Circles
- Arc Measures
- Chords
- Inscribed Angles and Polygons
- Angle and Segment Relationships in Circles
- Circles in the Coordinate Plane
- Circumference and Arc Length
- Areas of Circles and Sectors
- Areas of Polygons
- Three-Dimensional Figures
- Volume: Prisms, Cylinders, Pyramids, Cones, Spheres, Composite Figures
- Surface Area: Prisms, Cylinders, Pyramids, Cones, Spheres, Composite Figures
- **Marking Period 4 Review and Assessment**

Standards/Eligible Content and Skills

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Review perimeter, circumference, and area of polygons and circles	CC.2.3.HS.A.3	MP1
Estimate perimeter, circumference, and/or area of an irregular geometric figure	G.2.2.2.1	MP1
Find the measurement of a missing length, given the perimeter circumference, or area of a geometric figure	G.2.2.2.2	MP1
Develop and/or use strategies to estimate the area of a compound/composite figure	G.2.2.2.4	MP1
Find the side lengths of a polygon with a given perimeter to maximize the area of the polygon	G.2.2.2.3	MP1
Describe how a change in the linear dimension of a geometric figure affects its perimeter, circumference, and area	G.2.2.3.1	MP1
Model and solve real-world and mathematical problems applying perimeter, circumference, and area	CC.2.3.HS.A.3 CC.2.3.HS.A.14	MP1
Review: Simple probability	G.2.2.4 A1.2.3.3.1	MP1
Use area models to find probabilities of non-mutually exclusive events (geometric probability)	G.2.2.4.1	MP1
Model and solve real-world and mathematical area problems using probability	G.2.2.4 G.2.2.4.1 CC.2.3.HS.A.14	MP1
Identify and name points, lines, planes, segments, and rays in a geometric diagram	CC.2.3.HS.A.3	MP1
Sketch and name intersections of lines and planes	CC.2.3.HS.A.3	MP1
Model and solve real-world and mathematical problems involving lines and planes	CC.2.3.HS.A.3 CC.2.3.HS.A.14	MP1
Use the Ruler Postulate	CC.2.3.HS.A.3	MP1
Compare segments for congruence	CC.2.3.HS.A.3	MP1
Use the Segment Addition Postulate to determine lengths of segments	CC.2.3.HS.A.3	MP1
Use the Midpoint and Distance Formulas	G.2.1.2.1	MP1
Find lengths using midpoints and segment bisectors	G.2.1.2.1	MP1
Classify polygons according to the number of sides and whether they are concave or convex	G.1.2.1.4	MP1
Find the perimeters and areas of polygons in the coordinate plane	G.1.2.1.4	MP1
Name, measure, and classify angles	CC.2.3.HS.A.3	MP1
Identify congruent angles	CC.2.3.HS.A.3	MP1
Find the measures of angles using the Angle Addition Postulate	CC.2.3.HS.A.3	MP1

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Bisect angles to find missing measures	G.2.2.1.1	MP1
Identify complementary and supplementary angles	G.2.2.1.1	MP1
Identify linear pairs and vertical angles	G.2.2.1.1	MP1
Identify postulates using diagrams	CC.2.3.HS.A.3	MP1
Sketch and interpret geometric diagrams	CC.2.3.HS.A.3	MP1
Write and complete two-column proofs to prove statements about segments and angles	G.1.3.2.1 CC.2.3.HS.A.3	MP1
Name properties of congruence	G.1.3.2.1 CC.2.3.HS.A.3	MP1
Write paragraph proofs to prove geometric relationships	G.1.3.2.1 CC.2.3.HS.A.3	MP1
Identify parallel lines, skew lines, perpendicular lines, and parallel planes	CC.2.3.HS.A.3	MP1
Identify pairs of angles formed by transversals	G.2.2.1.2	MP1
Use properties of parallel lines cut by transversals to identify special angle pairs and find angle measures	G.2.2.1.2	MP1
Prove theorems about parallel lines using angle theorems and their converses	G.1.3.2.1 2.2.2.1.2	MP1
Use the Transitive Property of Parallel lines	G.2.2.1.2	MP1
Model and solve real-world and mathematical problems involving parallel lines	G.2.2.1.2 CC.2.3.HS.A.14	MP1
Find the distance from a point to a line using the distance formula and slope	G.2.1.2.1 G.2.1.2.2	MP1
Prove theorems about perpendicular lines	G.1.3.2.1 G.2.1.2.2	MP1
Model and solve real-world and mathematical problems involving perpendicular lines	G.2.1.2.2 CC.2.3.HS.A.14	MP1
Partition a directed line segment using slope	G.2.1.2.2	MP1
Identify parallel and perpendicular lines on a coordinate plane	G.2.1.2.1 G.2.1.2.2 G.2.1.2.3	MP1
Write equations of parallel and perpendicular lines	CC.2.3.HS.A.11	MP1
Marking Period 1 Review and Assessment		**MP1**
• Review and demonstrate knowledge of Perimeter, Circumference, and Area		MP1
• Review and demonstrate knowledge of Geometric Probability		MP1
• Review and demonstrate knowledge of the Basics of Geometry		MP1

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
• Review and demonstrate knowledge of Postulates and Proofs		MP1
• Review and demonstrate knowledge of Parallel and Perpendicular Lines		MP1
Perform translations and compositions	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Model and solve real-world and mathematical problems using translations and compositions	CC.2.3.HS.A.1 CC.2.3.HS.A.2 CC.2.3.HS.A.14	MP2
Perform reflections and glide reflections	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Model and solve real-world and mathematical problems involving reflections	CC.2.3.HS.A.1 CC.2.3.HS.A.2 CC.2.3.HS.A.14	MP2
Identify lines of symmetry	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Perform rotations and compositions with rotations	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Identify rotational symmetry	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Identify congruent figures	G.1.3.1.1	MP2
Describe congruence transformations	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Use theorems about congruence transformations	CC.2.3.HS.A.1 CC.2.3.HS.A.2	MP2
Identify and perform dilations	G.1.3.1.2 CC.2.3.HS.A.1	MP2
Model and solve real-world and mathematical problems involving scale factors and dilations	G.1.3.1.2 CC.2.3.HS.A.1 CC.2.3.HS.A.14	MP2
Perform and describe similarity transformations	G.1.3.1.2	MP2
Prove that triangles are similar	G.1.2.1.1 G.1.3.1.2 G.1.3.2.1	MP2
Classify triangles by sides and angles	G.1.2.1.1 CC.2.3.HS.A.3	MP2
Find interior and exterior angle measures of triangles	G.1.2.1.1	MP2
Identify and use corresponding parts to find missing measures of congruent figures	G.1.3.1 G.1.3.2.1	MP2
Use triangle congruence theorems to prove triangles are congruent and to model and solve real-world and mathematical problems: Side-Angle-Side (SAS), Side-Side-Side (SSS), Hypotenuse-Leg (HL), Angle-Side-Angle (ASA), Angle-Angle-Side (AAS)	G.1.3.1.1 G.1.3.2.1 CC.2.3.HS.A.14	MP2

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Use the Third Angles Theorem and the Base Angles Theorem	G.1.2.1.3	MP2
Use properties of isosceles and equilateral triangles to find missing values and complete proofs	G.1.2.1.3 G.1.3.2.1	MP2
Model and solve real-world and mathematical problems using congruent triangles	G.1.2.1.1 G.1.2.1.3 G.1.3.1.1 CC.2.3.HS.A.14	MP2
Write and complete two column proofs using the triangle postulates and corresponding parts of congruent triangles are congruent	G.1.3.1 G.1.3.1.2 G.1.3.2.1	MP2
Use perpendicular bisectors to find measures	CC.2.3.HS.A.3 CC.2.3.HS.A.14	MP2
Use angle bisectors to find measures and distance relationships	CC.2.3.HS.A.3 CC.2.3.HS.A.14	MP2
Write equations for perpendicular bisectors	CC.2.3.HS.A.3 CC.2.3.HS.A.14	MP2
Define and identify medians and altitudes of triangles	G.1.2.1.1	MP2
Use midsegments of triangles in the coordinate plane	G.1.2.1.1	MP2
Use the Triangle Midsegment Theorem to find distances	G.1.2.1.1	MP2
List sides and angles of a triangle in order by size	G.1.2.1.1	MP2
Use the Triangle Inequality Theorem to find the possible side lengths of triangles	G.1.2.1.1 G.1.3.1.2	MP2
Compare measures in triangles	G.1.3.1.1	MP2
Model and solve real-world and mathematical problems using the Hinge Theorem	G.1.3.1.1 CC.2.3.HS.A.14	MP2
Marking Period 2 Review and Assessment		**MP2**
• Review and demonstrate knowledge of Transformations		MP2
• Review and demonstrate knowledge of Congruent Triangles		MP2
• Review and demonstrate knowledge of Relationships within Triangles		MP2
Use interior and exterior angles of polygons to find missing measures	G.1.2.1 CC.2.3.HS.A.3	MP3
Use properties to find side lengths and angles of parallelograms	G.1.2.1 CC.2.3.HS.A.3	MP3
Use parallelograms in the coordinate plane	G.1.2.1.2	MP3
Identify and verify parallelograms	G.1.2.1.2	MP3
Show that a quadrilateral is a parallelogram in the coordinate plane	G.1.2.1.2	MP3
Use properties of special parallelograms	G.1.2.1.2	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Use coordinate geometry to identify special types of parallelograms	G.1.2.1.2	MP3
Use properties of trapezoids and kites	G.1.2.1.2	MP3
Use the Trapezoid Midsegment Theorem to find distances	G.1.2.1.2	MP3
Identify quadrilaterals	G.1.2.1.2	MP3
Model and solve real-world and mathematical quadrilateral and other polygon problems	CC.2.3.HS.A.14	MP3
Use similarity statements to find the scale factor, list all pairs of congruent angles, and write the ratios of the corresponding side lengths	G.1.3.1.2	MP3
Find corresponding lengths in similar polygons (separate and overlapping)	G.1.3.1.2	MP3
Find perimeters and areas of similar polygons (separate and overlapping)	G.1.3.1.2	MP3
Determine whether polygons are similar	G.1.3.1.2	MP3
Model and solve real-world and mathematical problems involving similar polygons (separate and overlapping)	CC.2.3.HS.A.14	MP3
Use the Angle-Angle (AA), Side-Side-Side (SSS), and Side-Angle-Side (SAS) Similarity Theorems to show that two triangles are similar	G.1.2.1.1 G.1.3.1.2	MP3
Use the Triangle Proportionality Theorem and its converse	G.1.2.1.1 G.1.3.1.2	MP3
Use the Three Parallel Lines and Triangle Bisector Theorems to find missing values	CC.2.3.HS.A.3	MP3
Prove triangles are similar using the triangle similarity theorems (two-column proof)	G.1.3.2.1 CC.2.3.HS.A.6	MP3
Model and solve real-world and mathematical problems involving similar triangles (separate and overlapping)	CC.2.3.HS.A.6 CC.2.3.HS.A.14	MP3
Use the Pythagorean Theorem and the Converse of the Pythagorean Theorem	G.2.1.1.1	MP3
Classify triangles using the Triangle Inequality Theorem and the Pythagorean Identities Theorem: Acute, Right, Obtuse	G.1.2.1.1 G.1.3.1.2 G.2.1.1.1	MP3
Find side lengths in special right triangles: 30-60-90, 45-45-90	G.2.1.1 G.2.1.1.1	MP3
Model and solve real-world and mathematical problems involving special right triangles	G.1.2.1.1 G.2.1.1 G.2.1.1.1	MP3
Identify similar triangles containing right angles	G.1.3.1.1 G.2.1.1 G.2.1.1.1	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Model and solve real-world and mathematical problems involving similar right triangles	G.1.3.1.1 G.2.1.1 G.2.1.1.1 CC.2.3.HS.A.14	MP3
Find the geometric mean	G.1.3.1.2	MP3
Use geometric mean to find the value of a missing length	G.1.3.1.2	MP3
Model and solve real-world and mathematical problems using the geometric mean	G.1.3.1.2 CC.2.3.HS.A.14	MP3
Marking Period 3 Review and Assessment		**MP3**
• Review and demonstrate knowledge of Quadrilaterals and Other Polygons		MP3
• Review and demonstrate knowledge of Similarity		MP3
• Review and demonstrate knowledge of Right Triangles		MP3
Use the tangent ratio	G.2.1.1.2	MP4
Model and solve real-world and mathematical problems involving the tangent ratio	G.2.1.1.2 CC.2.3.HS.A.14	MP4
Use the sine and cosine ratios	G.2.1.1.2	MP4
Find the sine and cosine of angle measures in special right triangles	G.2.1.1.2	MP4
Model and solve real-world and mathematical problems involving sine and cosine ratios	G.2.1.1.2 CC.2.3.HS.A.14	MP4
Use inverse trigonometric ratios	G.2.1.1.2	MP4
Solve right triangles	G.2.1.1.2	MP4
Find the area of triangles using the trigonometric area formula	G.2.1.1.2	MP4
Identify special segments and lines of circles	G.1.1.1.1	MP4
Draw and identify common tangents of circles	G.1.1.1.1	MP4
Use the properties of tangents of circles	G.1.1.1.1 CC.2.3.HS.A.8	MP4
Find arc measures of circles	G.1.1.1.3 CC.2.3.HS.A.9	MP4
Identify congruent arcs of circles	G.1.1.1.2	MP4
Use chords of circles to find lengths and arc measures	G.1.1.1.3 CC.2.3.HS.A.9	MP4
Use inscribed angles	G.1.1.1.2	MP4
Use inscribed polygons	G.1.1.1.2	MP4
Find angle and arc measures	G.1.1.1.3 CC.2.3.HS.A.9	MP4
Use circumscribed angles	G.1.1.1.2	MP4
Use segments of chords, tangents, and secants	G.1.1.1.3	MP4
Write and graph equations of circles	CC.2.3.HS.A.11	MP4

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Model and solve real-world and mathematical problems using graphs of circles	CC.2.3.HS.A.3 CC.2.3.HS.A.11 CC.2.3.HS.A.14	MP4
Use the formula for circumference	G.2.2.2	MP4
Use arc lengths to find measures	CC.2.3.HS.A.9	MP4
Model and solve real-world and mathematical problems using circumference and arc lengths of circles	G.2.2.2 CC.2.3.HS.A.9 CC.2.3.HS.A.14	MP4
Measure angles in radians	CC.2.2.HS.C.7	MP4
Use the formula for the area of a circle	G.2.2.2.2	MP4
Find and use areas of sectors	G.2.2.2.5	MP4
Find the area of the shaded region of composite figures	G.2.2.2.4	MP4
Find areas of rhombuses and kites	G.1.2.1.2	MP4
Find angle measures in regular polygons	G.1.2.1.4	MP4
Find areas of regular polygons	G.1.2.1.4	MP4
Classify solids	CC.2.3.HS.A.3	MP4
Describe cross sections of a polyhedron	G.2.3.1 CC.2.3.HS.A.13	MP4
Sketch and describe solids of revolution	G.2.3.1 CC.2.3.HS.A.13	MP4
Find and use volumes: Prisms, Cylinders, Pyramids, Cones, Spheres	G.2.3.1.2 G.1.3.1.3 CC.2.3.HS.A.12	MP4
Find and use surface area: Prisms, Cylinders, Pyramids, Cones, Spheres	G.2.3.1.1 G.2.3.1.3	MP4
Model and solve real-world and mathematical problems using volumes and surface areas of prisms, cylinders, pyramids, cones, and spheres	G.2.3.1.1 G.2.3.1.2 G.2.3.1.3 CC.2.3.HS.A.12 CC.2.3.HS.A.14	MP4
Find the measure of a composite three-dimensional figure containing prisms, cylinders, pyramids, cones, and spheres	G.2.3.1.1 G.2.3.1.2	MP4
Marking Period 4 Review and Assessment		**MP4**
• Review and demonstrate knowledge of Trigonometry		MP4
• Review and demonstrate knowledge of Circles		MP4
• Review and demonstrate knowledge of Circumference, Area, and Volume		MP4

ASSESSMENTS

PDE 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:
Suggested but not limited to:

- Pre-assessments of prior knowledge (e.g., Entrance cards or KWL chart)
- Bellringers/Problems of the Day (PODs)
- Discussions
- Exit ticket
- Teacher observations/Questioning
- Graphic organizers (e.g., Venn Diagrams, word mapping, webbing, KWL chart, etc.)
- Outlining
- Cooperative learning
- Written work
- Quizzes
- Oral response
- Self-evaluation
- Homework
- Summarizing
- Note-taking

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:
Suggested but not limited to:

- Performance assessment
- Chapter/unit tests
- Quizzes
- Marking period assessments
- Projects
- Student presentations