

Geometry Honors

Course Description

Geometry Honors offers a rigorous study of high school Geometry, including analyzing the characteristics and properties of shapes; developing mathematical arguments about geometric relationships; using coordinate geometry; applying transformations and using symmetry to analyze mathematical situations; and using visualization, spatial reasoning and modeling to solve problems. Students who successfully complete this course, will have demonstrated mastery in Geometry math standards. In each unit of study, there is a purposeful movement from foundational knowledge to higher order thinking skills. Students demonstrate a fluent understanding of concepts and procedures, reason abstractly and quantitatively to solve problems, communicate their reasoning, model with mathematics, analyze data, and evaluate conclusions. In alignment with the skills detailed in the **Portrait of the Crusader**, students practice solving problems with innovation and imagination. They are taught to think critically about the synthesis of data and respond with defensible, original work. In all interactions, students are guided to act with integrity and respond to peers with respect and encouragement.

Assessment Practices

This course includes varied assessments, including traditional quizzes and tests which measure concepts and procedures; problem/solution/explanation opportunities where students solve complex problems and communicate their reasoning; and real-world scenarios where students define the problem, develop a plan, and solve the problem, evaluating and adjusting as necessary.

Essential Questions

1. How do we discover and justify geometric theorems and proofs of various figures?
2. How do we interpret and analyze real life situations using geometry and algebra?
3. How do we develop and apply logic through geometric and algebraic principles?

Curriculum Framework

First Quarter:

Summer Work to Reinforce Prerequisite Skills

- Solve Linear Equations : variables on both sides, multistep, fractional and operations on polynomials
- Solve Systems of equations in two variables by substitution and elimination.
- Factor: GCF, binomials with $a=1$, $a>1$, grouping, substitution

Introductions to Geometry

- Define points, lines, planes
- Define line segments and find their measures
- Define angles and find their measures
- Define angle pairs and their relationships
- Apply midpoint and distance formulas

Introduction to Reasoning and Proofs

- Apply perimeter, circumference and area
- Define conditional and biconditional statements
- Use deductive reasoning
- Write 2-column proofs
- Prove angles congruent

Second Quarter:

Parallel and Perpendicular Lines

- Define lines and angles
- Prove lines are parallel
- Explain the relation between angles formed by parallel lines and transversals
- Prove Theorems about parallel and perpendicular lines
- Apply parallel and perpendicular lines, slopes, equations of lines

Triangles and Congruence

- Define types of triangles
- Define congruent figures
- Prove congruent triangles by SSS, SAS, ASA, AAS
- Prove congruent triangles, corresponding parts of congruent triangles are congruent
- Define and Prove Isosceles, Equilateral and Right Triangles

Third Quarter:

Special Properties of Triangles

- Define perpendicular and angle bisectors
- Apply bisectors of a triangle
- Define and apply medians and altitudes of a triangle
- Define and apply midsegments of triangles
- Solve inequalities in one triangle
- Solve inequalities in two triangles

Quadrilaterals

- Define polygons
- Define parallelograms
- Prove a quadrilateral is a parallelogram
- Analyze rhombuses, rectangles and squares

Similarity

- Simplify ratios and solve proportions
- Define similar polygons
- Prove similarity

Radicals

- Simplify, add, subtract, multiply, divide

Fourth Quarter:

Right Triangles and Trigonometry

- Apply Pythagorean Theorem and its converse
- Solve special right triangles
- Solve trigonometric ratios
- Solve right triangles
- Apply The Law of Sines
- Apply The Law of Cosines

Area

- Define perimeters and areas of similar figures
- Apply arc measures, circumferences, arc lengths of circles
- Find areas of circles and sectors

Enrichment if time permits

- Define and solve tangent lines
- Define and solve chords and arcs
- Define and solve segment lengths
- Apply equation of circle

Resources

- Geometry Martin-Gay
- MyMathLab. (mymathlabforschool.com)
- Scientific Calculator
- Desmos application (ISO/Android or [web](#))

Grading

- 20 % MyMathLab,
- 25% Quizzes
- 25% Student Work
- 30 % Tests

Please refer to the student handbook for a complete explanation of absence and late work policies.