

**MEDFORD HIGH SCHOOL
COURSE SYLLABUS**

Department:

Mathematics

Course Title:

Geometry

Level and/or Grade:

Honors Grades 9-12

Prerequisite:

Grade A- or better in Algebra 1

Course Description:

Honors Geometry provides students with an in-depth study of the relationships, properties and measurements of geometric figures, special shape relationships, and trigonometry. Other topics include geometric patterns, constructions, proofs, coordinate geometry and transformations. Students will use models, projects, technology, facts, properties, and various reasoning skills (e.g. deductive), and will develop depth of understanding of these geometric concepts through communication, representation, reasoning, making connections, problem solving, and technology integration. They will develop mathematical language as they investigate problems within geometry and across the strands of mathematics, make and test conjectures, draw conclusions, and describe results.

Learning Standards: *Through communication, representation, reasoning, making connections, and problem solving, students will be able to...*

Number Sense and Operations:

- Find the approximate value of solutions to problems involving square roots; simplify radicals.
- Apply operations with powers and absolute value to the solution of problems.
- Use estimation to judge the reasonableness of results of computations and solutions to geometry problems.

Patterns, Relations and Algebra:

- Describe, complete, extend, analyze, and create a variety of geometric patterns.
- Use properties of the real number system to prove or disprove statements, and to justify steps in a sequential argument.
- Connect algebraic concepts with coordinate geometry (e.g. point-slope/y-intercept formulas, distance, midpoint); apply the results to the solution of problems.

Geometry:

- Recognize polygons; apply properties of sides, angles, and diagonals; detect symmetries.
- Use logical processes to test mathematical conjectures and write simple proofs.
- Apply congruence and similarity correspondences; draw congruent and similar figures using a compass, straightedge, protractor and/or technology.
- Apply properties of angles, parallel lines, arcs, radii, chords, tangents, and secants to solve problems.
- Use properties of special triangles to solve problems.
- Draw the results and interpret transformations on figures in the coordinate plane.

Learning Standards (cont.): Through communication, representation, reasoning, making connections, and problem solving, students will be able to...

Geometry (cont.)

- Use trigonometric ratios to solve problems.
- Use vertex-edge graphs to model and solve problems.

Measurement:

- Calculate perimeter, circumference and area of plane figures.
- Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones.
- Relate changes in measurement of attribute of an object to changes in other attributes.

Data Analysis, Statistics, and Probability:

- Represent geometric data in tables, charts, and graphs; form generalizations.

Course Alignment with High School Expectations for Student Learning:

Students will...

1. Analyze, interpret, evaluate and use logical reasoning to solve problems using a variety of resources and strategies.
 - Build new mathematical knowledge through problem solving.
 - Adapt and apply a variety of appropriate strategies to solve problems; reflect on the process of mathematical problem solving.
 - Monitor and reflect on the process of mathematical problems solving.
 - Recognize reasoning and proof as fundamental aspects of mathematics.
 - Make and investigate mathematical conjectures.
 - Solve problems that arise in mathematics and other contexts; use connections among mathematical ideas.
2. Communicate effectively to a variety of audiences.
 - Communicate mathematical thinking coherently and clearly to peers, teachers, and others - orally and through written work.
 - Use the language of mathematics to express ideas precisely.
3. Create works using a variety of communication forms.
 - Present arguments through writing; solve problems through projects, homework, tests, and quizzes; use technology; make oral presentations.
4. Develop skills and knowledge to reach personal and career goals.
 - Develop 'habits of mind': work beyond center of competence; gain attitude of persistence; seek feedback; develop confidence.
5. Work cooperatively to achieve objectives.
 - Work in pairs, small groups, and part of the whole class to solve problems.
 - Analyze and evaluate the mathematical thinking and strategies of others.

Assessment:

- See attached grading policy.