**Geometry Syllabus**

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Classroom: 321

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**Course Overview**

Geometry is a branch of mathematics that deals with shapes, sizes, and the properties of space. This course is designed to help students develop their understanding of geometric concepts, including points, lines, planes, angles, triangles, polygons, circles, and three-dimensional figures. Emphasis is placed on logical reasoning, problem-solving, and the application of geometric concepts to real-world situations. The course follows the Georgia Standards of Excellence (GSE).

**Course Objectives**

By the end of this course, students will be able to:

1. Understand and apply the basic properties and postulates of geometry.
2. Use inductive and deductive reasoning to prove theorems.
3. Analyze the properties of parallel and perpendicular lines.
4. Explore the relationships between angles, triangles, and other polygons.
5. Apply the Pythagorean Theorem and its converse.
6. Investigate the properties of circles, including arcs, chords, and tangents.
7. Use coordinate geometry to solve problems involving geometric figures.
8. Perform transformations, such as translations, reflections, rotations, and dilations.
9. Calculate areas, surface areas, and volumes of various geometric figures.
10. Make connections between algebra and geometry through the study of trigonometry.

**Course Outline**

**Unit 1: Basics of Geometry (2 weeks)**

* **Standards:** MGSE9-12.G.CO.1, MGSE9-12.G.CO.9
* **Topics:**
* Points, lines, and planes
* Line segments and rays
* Measuring and constructing segments and angles
* Angle pairs (complementary, supplementary, vertical, and adjacent)
* The coordinate plane
* **Assessment:** Quiz on geometric basics

**Unit 2: Reasoning and Proof (2 weeks)**

* **Standards:** MGSE9-12.G.CO.9, MGSE9-12.G.CO.10
* **Topics:**
* Inductive reasoning
* Conditional statements
* Deductive reasoning
* Writing and proving geometric theorems
* Two-column, paragraph, and flow proofs
* **Assessment:** Unit test on reasoning and proof

**Unit 3: Parallel and Perpendicular Lines (3 weeks)**

* **Standards:** MGSE9-12.G.CO.9, MGSE9-12.G.GPE.5
* **Topics:**
* Parallel lines and transversals
* Angles formed by parallel lines and transversals
* Proving lines parallel
* Perpendicular lines
* Slope of parallel and perpendicular lines
* **Assessment:** Quiz on parallel and perpendicular lines

**Unit 4: Congruent Triangles (3 weeks)**

* **Standards:** MGSE9-12.G.CO.6, MGSE9-12.G.CO.7
* **Topics:**
* Classifying triangles by sides and angles
* Triangle congruence (SSS, SAS, ASA, AAS, and HL)
* Proving triangles congruent
* Isosceles and equilateral triangles
* Applications of congruent triangles
* **Assessment:** Unit test on congruent triangles

**Unit 5: Relationships in Triangles (3 weeks)**

* **Standards:** MGSE9-12.G.CO.10, MGSE9-12.G.CO.11
* **Topics:**
* Perpendicular bisectors and angle bisectors
* Medians, altitudes, and midsegments
* Triangle inequalities
* The Pythagorean Theorem and its converse
* Special right triangles (30-60-90 and 45-45-90)
* **Assessment:** Quiz on relationships in triangles

**Unit 6: Quadrilaterals and Polygons (3 weeks)**

* **Standards:** MGSE9-12.G.CO.11, MGSE9-12.G.GPE.4
* **Topics:**
* Properties of quadrilaterals (parallelograms, rectangles, rhombuses, squares, trapezoids, kites)
* Proving quadrilaterals are parallelograms
* Polygon angle-sum theorems
* Properties of regular polygons
* **Assessment:** Unit test on quadrilaterals and polygons

**Unit 7: Similarity (3 weeks)**

* **Standards:** MGSE9-12.G.SRT.1, MGSE9-12.G.SRT.2
* **Topics:**
* Ratios and proportions
* Similar polygons
* Triangle similarity (AA, SSS, SAS)
* Proving triangles similar
* Applications of similarity
* **Assessment:** Quiz on similarity

**Unit 8: Right Triangles and Trigonometry (4 weeks)**

* **Standards:** MGSE9-12.G.SRT.6, MGSE9-12.G.SRT.8
* **Topics:**
* Right triangle properties
* Trigonometric ratios (sine, cosine, tangent)
* Solving right triangles
* Applications of trigonometry in real-world problems
* Using trigonometry to find area
* **Assessment:** Unit test on right triangles and trigonometry

**Unit 9: Circles (4 weeks)**

* **Standards:** MGSE9-12.G.C.1, MGSE9-12.G.C.2
* **Topics:**
* Properties of circles
* Arcs and central angles
* Inscribed angles
* Chords, tangents, and secants
* Equations of circles in the coordinate plane
* **Assessment:** Quiz on circles, performance task

**Unit 10: Surface Area and Volume (3 weeks)**

* **Standards:** MGSE9-12.G.GMD.3, MGSE9-12.G.MG.1
* **Topics:**
* Surface area of prisms, cylinders, pyramids, and cones
* Volume of prisms, cylinders, pyramids, cones, and spheres
* Applications of surface area and volume in real-world contexts
* Solving problems involving composite figures
* **Assessment:** Unit test on surface area and volume

**Unit 11: Transformations and Symmetry (2 weeks)**

* **Standards:** MGSE9-12.G.CO.2, MGSE9-12.G.CO.3
* **Topics:**
* Reflections, rotations, translations, and dilations
* Symmetry in geometric figures
* Tessellations and their properties
* Identifying and describing transformations in the coordinate plane
* **Assessment:** Quiz on transformations and symmetry

**Final Review and Exam (2 weeks)**

* Comprehensive review of all units
* **Assessment:** Final exam covering all course content

**Grading Policy**

* **Homework:** 10%
* **Quizzes:** 20%
* **Unit Tests:** 40%
* **Projects/Performance Tasks:** 20%
* **Final Exam:** 10%

**Materials Needed**

* Geometry textbook: [Textbook Title]
* Notebook or binder with graph paper
* Scientific calculator
* Ruler, protractor, and compass
* Pencils, erasers, and highlighters

**Classroom Expectations**

* Be on time and prepared for class.
* Participate actively in lessons and discussions.
* Complete all assignments on time and to the best of your ability.
* Show respect for your classmates, teacher, and classroom materials.
* Follow all school rules and procedures.

**Attendance Policy**

Consistent attendance is crucial for understanding the material. Students are responsible for catching up on missed work and seeking extra help if needed.

**Academic Integrity**

Academic honesty is expected at all times. Cheating, plagiarism, and other forms of dishonesty will result in disciplinary action as per school policy.

**Extra Help**

Students who need additional help are encouraged to attend office hours or schedule a meeting with the instructor. Tutoring may also be available through the school.

**Parent/Guardian Communication**

Regular updates on student progress will be communicated via [preferred method, e.g., email, online portal]. Parents and guardians are encouraged to contact the instructor with any questions or concerns.

Shape

This syllabus outlines the structure, expectations, and content for a high school Geometry course aligned with the Georgia Standards of Excellence, providing a roadmap for student success in geometry.