
Geometry Syllabus

This is a course in geometry, which "deals with the deduction of the properties, measurements and relationships of points, lines, angles, and figures in space" (Webster, 1989.) You will actively discover, through your own investigations, the theorems and properties of geometry and how they apply to real life situations. This course is required for admission into most colleges and other post-secondary options.

Course Overview

You will be provided with examples, exercises and activities that will allow you to discover geometrical relationships and theorems. You will then apply many of these to real life situations. In addition, you can use Geometer's Sketchpad to actively explore several different ideas and test out these theorems. At the conclusion of this course you should realize the many interesting uses of math, in particular geometry in today's world. Your class time will be spent exploring patterns and relationships in different situations and making conjectures that may become theorems. You will test these conjectures in a variety of situations. Through the use of technology and real world application you will see how these conjectures are put to use. You will be required to have a compass, straightedge (ruler) and a basic scientific calculator with trigonometric functions.

Assignments

These will be assigned with every section. Your teacher will check your assignments by spot-checking, homework quizzes or through class discussions on a group of problems. It is YOUR responsibility to complete your assignments and understand what you are doing. Meeting this responsibility will help you on chapter tests. If you are given time in class to work on assignments, you should use it to try problems similar to each of the examples you had worked through in that day's class. I encourage you to work in small groups. However, YOU need to UNDERSTAND what you are doing and WHY you are doing it!

Quizzes and Tests

Quizzes are generally given once per chapter. They will range in value from 20 to 30 points each. Tests will be given at the end of every chapter and will always be worth 100 points each.

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Portfolios

I strongly suggest you purchase a 3-ring binder that you can divide into the following sections:

1. Class Notes
2. Assignments, Quizzes and Tests (arranged by chapter)
3. Definitions
4. Conjectures
5. Your thoughts, concerns, questions, etc.

These portfolios will be advantageous to you in learning and studying course material. The first four sections are self-explanatory. The fifth section is a place for you to put questions or comments on a certain problem or topic, or just your thoughts or feelings on any aspect of the course.

Grading

Based on points earned out of points possible.

Scale:	89% - 100%	A	87% - 88%	A-
	85% - 86%	B+	78% - 84%	B
	76% - 77%	B-	74% - 75%	C+
	65% - 73%	C	63% - 64%	C-
	61% - 62%	D+	52% - 60%	D
	50% - 51%	D-	0% - 49%	F

(Note: This is the grading scale that I use. You may have a mandated grading scale by your school or prefer to use one of your own. In any case, make sure students know your scale before you begin assigning grades.)

Test retakes are allowed at the discretion of the teacher. The final score will be the mean average of the scores. Assignments will NOT be accepted late under any circumstance. Everyone will take quizzes and tests the day they are given. If you are absent on the day of a quiz or test, you must make it up the next day you are in school.

Geometry Expectations

1. Inductive Reasoning
 - a. Students will understand what it means to reason inductively
 - b. Students will understand how to use inductive reasoning to find patterns in numbers and write formulas for sequences
 - c. Students will understand how to use inductive reasoning to make conjectures about various properties of geometric figures
2. Building Blocks of Geometry
 - a. Students will understand the difference between definitions, postulates, conjectures and theorems and how these come together to form a geometric system
 - b. Students will learn about the three undefined terms in geometry
 - c. Students will learn how to write “good definitions”
 - d. Students will write definitions for important geometric terms
3. Constructing Geometry
 - a. Students will learn about the tools of geometric construction
 - b. Students will learn how to use “The Geometer’s Sketchpad”
 - c. Students will use a combination of construction tools and “The Geometer’s Sketchpad to construct various geometric items
4. Triangles
 - a. Students will understand the reflective property as it relates to certain types of triangles
 - b. Students will understand how to find the sum of the angles of any polygon
 - c. Students will learn about exterior angles and their measures
 - d. Students will learn about points of concurrency in triangles
 - e. Students will learn about congruence and how to show two triangles are congruent
 - f. Students will learn how to write a proof justifying the congruence of two congruent triangles or the congruence of corresponding parts of two congruent triangles
 - g. Students will learn about and apply the Pythagorean Theorem
5. Quadrilaterals
 - a. Students will be able to define and classify several special quadrilaterals
 - b. Students will learn properties of these figures
 - c. Students will be able to put these figures in a hierarchy based on properties shared by these figures
 - d. Students will be able to use algebra techniques along with properties of these figures to find missing side lengths or angle measures
6. Circles
 - a. Students will be able to define and recognize different objects associated with circles
 - b. Students will understand the properties these objects have
 - c. Students will learn more about the number pi
 - d. Students will learn how to calculate arc length

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7. Coordinate Geometry
 - a. Students will understand how to use a coordinate plane
 - b. Students will understand how to calculate slopes and distances on the coordinate plane
 - c. Students will be able to write proofs involving coordinate geometry
 - d. Students will be able to write equations for lines on the coordinate plane
 - e. Students will be able to find the intersection of two lines on the coordinate plane
 - f. Students will be able to write an equation for a circle
8. Area
 - a. Students will understand fundamental properties of area
 - b. Students will derive and use area formulas for geometric figures and irregularly shaped regions
 - c. Students will realize the usefulness of area applications in society
9. Surface Area and Volume
 - a. Students will be able to define and recognize three dimensional figures and their parts
 - b. Students will be able to draw a net of a three dimensional figure
 - c. Students will be able to calculate surface areas from these nets
 - d. Students will develop formulas for surface area and use these to calculate surface area
 - e. Students will understand the fundamental properties of volume
 - f. Students will be able to calculate volume from formulas
 - g. Students will realize the usefulness of surface area and volume applications in society
10. Similarity
 - a. Students will become familiar with ratios and proportions
 - b. Students will be able to solve proportions
 - c. Students will understand similarity
 - d. Students will be able to prove two triangles are similar or the corresponding parts of two triangles are proportional (corresponding angles are equal)
 - e. Students will understand and apply the fundamental theorem of similarity
 - f. Students will understand how to divide a segment into n congruent parts
 - g. Students will realize the usefulness of similarity applications in society
11. Trigonometry
 - a. Students will learn the sine, cosine and tangent ratios
 - b. Students will use these ratios to find missing side lengths and angle measures
 - c. Students will learn and use the law of sines
 - d. Students will learn and use the law of cosines
 - e. Students will realize the usefulness of trigonometry applications in society
12. Isometries and Tessellations
 - a. Students will learn about reflections, rotations, translations, and glide reflections
 - b. Students will learn about tessellations
 - c. Students will combine their knowledge of isometries and tessellations to make a tessellation of their own
 - d. Students will realize the usefulness of these isometry applications in society

Geometry Syllabus

UNIT 1: Geometric Foundations

- Lesson 1: History of Geometry
- Lesson 2: Basic Building Blocks of Geometry
- Lesson 3: Segments, Rays and Angles
- Lesson 4: Measurement and Congruency
- Lesson 5: Using Construction Tools
- Lesson 6: Reasoning in Geometry—Inductive
- Lesson 7: Reasoning in Geometry—Deductive
- Lesson 8: Writing Good Definitions
- Lesson 9: Defining Terms Association with Polygons

UNIT 2: Geometric Relationships

- Lesson 1: Line and Angle Relationships
- Lesson 2: Parallel Lines
- Lesson 3: Triangle Inequalities
- Lesson 4: Polygon Angle Sum
- Lesson 5: Exterior Angle Conjectures
- Lesson 6: DERA

UNIT 3: Trying Triangles

- Lesson 1: Defining Triangles
- Lesson 2: Properties of Isosceles and Equilateral Triangles
- Lesson 3: Triangle Congruence
- Lesson 4: Triangle Congruence Proofs
- Lesson 5: Pythagorean Theorem
- Lesson 6: Special Cases of the Pythagorean Theorem
- Lesson 7: The Converse of the Pythagorean Theorem

UNIT 4: Quirky Quadrilaterals

- Lesson 1: Defining Quadrilaterals
- Lesson 2: Trapezoids
- Lesson 3: Parallelograms
- Lesson 4: Rhombi
- Lesson 5: Kites
- Lesson 6: Rectangles
- Lesson 7: Squares

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UNIT 5: Crafty Circles

- Lesson 1: Defining Circles
- Lesson 2: The Chord
- Lesson 3: The Tangent
- Lesson 4: Arcs and Angles
- Lesson 5: The Circumference to Diameter Ratio
- Lesson 6: Arc Length

UNIT 6: Coordinate Geometry

- Lesson 1: The Coordinate Plane
- Lesson 2: Midpoint and Slope Conjectures
- Lesson 3: Slopes of Parallel and Perpendicular Lines
- Lesson 4: The Distance Formula
- Lesson 5: Proofs in Coordinate Geometry
- Lesson 6: Equations of Lines
- Lesson 7: Finding Intersections of Lines
- Lesson 8: Equations of Circles

UNIT 7: Area

- Lesson 1: Fundamental Properties of Area
- Lesson 2: Finding Areas of Irregularly Shaped Regions
- Lesson 3: Areas of Rectangles and Parallelograms
- Lesson 4: Areas of Triangles and Trapezoids
- Lesson 5: Areas of Regular Polygons
- Lesson 6: Areas of Circles

UNIT 8: Three-Dimensional Geometry

- Lesson 1: Three-Dimensional Figures
- Lesson 2: Nets
- Lesson 3: Surface Areas of Prisms and Cylinders
- Lesson 4: Surface Areas of Pyramids and Cones
- Lesson 5: Volumes of Prisms and Cylinders
- Lesson 6: Volumes of Pyramids and Cones
- Lesson 7: Surface Area and Volume of a Sphere

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UNIT 9: Similarity

- Lesson 1: Ratio and Proportion
- Lesson 2: Similarity
- Lesson 3: Similar Triangles
- Lesson 4: Indirect Measurement
- Lesson 5: Corresponding Parts of Similar Triangles
- Lesson 6: The Fundamental Theorem of Similarity
- Lesson 7: Proportional Segments by Parallel Lines

UNIT 10: Trigonometry

- Lesson 1: Introduction to Trigonometric Ratios
- Lesson 2: Using Trigonometric Ratios to Find Unknown Side Lengths
- Lesson 3: Using Trigonometric Ratios to Find Unknown Angle Measure
- Lesson 4: Problem Solving with Trigonometric Ratios
- Lesson 5: The Law of Sines
- Lesson 6: The Law of Cosines

UNIT 11: Transformations and Tessellations

- Lesson 1: Transformations
- Lesson 2: Properties of Isometries
- Lesson 3: Symmetry
- Lesson 4: Tessellations with Regular Polygons
- Lesson 5: Tessellations with Irregular Polygons
- Lesson 6: Tessellations Involving Translations