Geometry, Part 1
Course Outline & Objectives

Course Description:

In Geometry, students will begin with an understanding of the basic tools of geometry, including points, lines, and planes, and will go on to master angles and angle pair relationships, as well as polygons. Students will learn to construct proofs and learn the relationships of perpendicular and parallel lines, as well as what constitutes congruent triangles. Students will become proficient in understanding the anatomy of triangles.

Credits - One Semester (0.5 Carnegie unit / CA: 5 credits) | Prerequisites: Algebra 1

Course Outline

Unit 1: Foundations of Geometry

1.1 Points, Lines, & Planes
1.2 Measuring Segments
1.3 Measuring Angles
1.4 Angle Relationship & Angle Pairs
1.5 Constructions
1.6 Classifying Polygons
1.7 Perimeter & Area
1.8 Circles and Its Parts

Common Core Standards

In Unit 1, students will learn to:
Lessons will concentrate on the fundamentals of points, angles, lines, planes, segments, polygons, circles, and constructions. Measurements using perimeter, circumference, and area will also be introduced.
[G.CO.1, G.GPE.7, G.CO.9, G.CO.12, G.GMD.1]

Unit 2: Reasoning & Proof

2.1 Conditional Statements
2.2 Inductive & Deductive Reasoning
2.3 Postulates, Theorems & Intro to Proofs
2.4 Algebraic Proofs
2.5 Segment Proofs
2.6 Angle Proofs

In Unit 2, students will learn to:
The basic principles of reasoning, including deductive and inductive reasoning. What conditional statements are, as well as converse, inverse, and contrapositive statements. To use logic and to develop algebraic, segment, and angle proofs.
[G.CO.9, G.CO.10, G.CO.11, REI.A.1]

Unit 3: Parallel & Perpendicular Lines

3.1 Lines and Angles
3.2 Parallel Lines and Algebra
3.3 Proving Lines Parallel
3.4 Slope and Equations of Lines
3.5 Perpendicular Lines

In Unit 3, students will learn to:
The nature of the angles formed when parallel lines are divided by a transversal. To prove lines are parallel, perpendicular, or neither. To use information, like slope and a given point, to write an equation of a line. You will be able to identify three different forms of an equation of a line, including slope-intercept, point-slope, and standard form
[G.CO.9, G.GPE.5]

Unit 4: Congruence

4.1 Congruent Figures
4.2 Classifying Triangles & Angles of Triangles
4.3 Congruent Triangles by SSS and SAS
4.4 Congruent Triangles by ASA & AAS
4.5 Isosceles vs. Equilateral Triangles & CPCTC
4.6 Pythagorean Theorem & HL

In Unit 4 students will learn:
The minimum requirements to determine whether or not two figures are congruent and identify congruency in other figures. To use SSS, SAS, AAS, ASA, and HL to prove triangles are congruent. To recognize and learn the key parts of isosceles and equilateral triangles. These properties will be used to prove corresponding parts of congruent triangles are congruent (CPCTC).
[G.CO.7, G.CO.8, G.CO.10, G.SRT.5, G.GPE.4]

Unit 5: Anatomy of Triangles

5.1 Midsegments of Triangles
5.2 Perpendicular and Angle Bisectors
5.3 Medians and Altitudes of Triangles
5.4 Indirect Proofs
5.5 Inequalities in One and Two Triangles
5.6 Constructing Centers of Triangles

In Unit 5 students will learn:
The anatomy of triangles, including mid-segments, perpendicular bisectors, angle bisectors, medians, and altitudes of triangles. The concept of indirect proofs. The idea of inequalities in one triangle and inequalities in two triangles. The concept of the construction center of the triangle.
[G.CO.9, G.CO.10, G.CO.11, G.CO.12]

Unit 6: Similarity

6.1 Ratios and Proportions
6.2 Similar Polygons and Scale Factor
6.3 Proving Triangles are Similar
6.4 Geometric Mean and Parts of Similar Triangles
6.5 Parallel Lines and Proportional Parts

In Unit 6 students will learn:
The concept of ratio and proportion and use them to solve problems involving angle measures. To recognize the conditions that will make polygons similar, prove that triangles are similar using similarity theorems, and use the geometric mean to solve for the missing lengths of a triangle. To use proportionality to find the missing lengths in a triangle containing parallel lines.
[G.SRT.2, G.SRT.3, G.SRT.4, G.SRT.5, G.SRT.6]