



Content/Discipline **Geometry, Term 1**

<http://mcsportal.net>

Marking Period 1

Topic and Essential Question

Unit 1 - (1) What are points, lines, and planes? (2) How do we prove line segments are congruent? (3) How can we find the midpoint given two points? (4) How do we find the distance between two points? (5) How do we find the distance between two points? (6) How do we measure and classify angles using a protractor? (7) How do we describe angle pair relationships? (8) How do we classify polygons? (9) How do we find the perimeter and area of polygons? (10) How do we find the circumference and area of circles?

Unit 2 – (1) How do we use inductive reasoning? (2) How do we use the properties of algebra in deductive reasoning? (3) How do we prove statements about segments and angles? (4) How do we prove angle pair relationships?

Unit/Topics

Unit 1- Essentials of Geometry

Unit 2- Reasoning and Proof

SWBAT/Objectives

Unit 1 – 10 days Students will be able to...

- Name and sketch geometric figures,
- Use postulates to identify congruent segments
- Find lengths of segments in coordinate planes
- Find midpoint of a segment
- Name, measure and classify angles
- Identify complementary and supplementary angles
- Find circumference and area of circles

Unit 2 – 8 days Students will be able to...

- Describe patterns, including visual and number patterns
- Use properties of equality and laws of logic to prove basic theorems about congruence, supplementary angles, complementary angles, and vertical angles

Vocabulary/Key
Terms

Unit 1: undefined terms: point, line, plane; line segment, endpoints, rays, opposite rays, postulate, axiom, congruent segments, midpoint, segment bisector, acute, right, and obtuse angles, angle bisector, linear pair, vertical angles, polygon, convex,

concave, equilateral, equiangular, regular

Unit 2: conjecture, proof, two-column proof, theorem, property, segments, angles, segment addition postulate, angle addition postulate, addition proportion, subtraction property, division property, multiplication property, distributive property, reflexive property, symmetric property, and transitive property

Assessments:

- Classwork
- Lesson Summary
- Homework
- Warm-up (DO NOW) Quiz next day
- Unit Tests
- Binder Check

Common Core Standards:

Common Core Standards for Math Practices:

Common Core Standards Addressed

G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
G-CO.9	Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>
G-PFE.4	Use coordinates to prove simple geometric theorems algebraically. <i>For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, -3) lies on the circle centered at the origin and containing the point (0, 2).</i>
G-PFE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

A-CED.1	Create equations in one variable and use them to solve problem.
A-CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as solving equations.

G-CO.9	Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>
G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i>

Differentiated Instruction:

- Flexible grouping
- Cooperative Learning
- Visual Learning – SMART Board, White board
- Visual and interactive questions using the Smart board

ELLs:

- Students with ELL's will watch videos (the video has English and Spanish both versions) and additional tutorials about the lesson through the class website.
- Students are allowed extra time for works and assessments.

SWDs:

- Preview the Key Terms to give students access to context.
- Assign chapter summary to give less proficient readers access to content.

High-Achievers:

- Have gifted students assist students that are not as gifted.
- Ask students to take on leadership roles when working in groups.

Resources/Books

- ✚ Graphing Calculator for individual use inside and outside of the classroom.
- ✚ Math XL for online HW and study plan

 Schoolology/YouTube for unit test reviews

Homework: Per Teacher



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Marking Period 2

Topic and Essential Question

Unit 3 – (1) How do identify angles formed by transversals? (2) What are the properties of parallel lines cut by a transversal? (3) How do we prove that two lines are parallel? (4) How do we find and use the slopes of lines? (5) How do we write and graph the equations of lines? (6) How do we prove theorems about perpendicular lines?

Unit 4 – (1) How do we apply the triangle sum properties? (2) What are the properties of congruent triangles? (3) How do we prove triangles are congruent using SSS/SAS/ASA/AAS/HL congruence postulates/theorems? (4) How do we prove corresponding parts of congruent triangles are congruent? (5) How do we apply the properties of isosceles and equilateral triangles?

Unit/Topics

Unit 3- Parallel and Perpendicular Lines

Unit 4 – Triangle Congruence

SWBAT/Objectives

Unit 3 – 11 days Students will be able to...

- Classify angle pairs formed by three intersecting lines
- Study angle pairs formed by a line that intersects two parallel lines
- Use angle relationships to prove lines parallel
- Investigate slopes of lines and study the relationship between slopes of parallel and perpendicular lines
- Find equations of parallel and perpendicular lines
- Prove theorems about perpendicular lines and find the distance between parallel lines in the coordinate plane

Unit 4 – 13 days Students will be able to...

- Find the measures of missing interior or exterior angles
- Match corresponding parts of congruent figures
- Prove triangles are congruent based on given information, or determine not enough information
- Prove parts of triangles are congruent by first proving triangle congruence
- Apply base angle theorems to isosceles and equilateral triangles

Vocabulary/Key Terms

Unit 3: parallel lines, skew lines, parallel planes, transversal, corresponding angles, alternate interior angles, alternate exterior angles, same-side interior angles, slope, slope-intercept form, distance from point to line

Unit 4: scalene, isosceles, equilateral, acute/right/obtuse/equilateral triangle, interior/exterior angles, congruent/congruence, corresponding angles/sides/statement, SSS/SAS/ASA/AAS/HL congruence, overlapping, vertex angle, legs, base, base angles, converse

Assessments:

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Common Core Standards:Common Core Standards for Math Practices:**Common Core Standards Addressed**

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G-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
G-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
G-CO.9	Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i>
G-CO.10	Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i>
G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment;</i>

	<i>and constructing a line parallel to a given line through a point not on the line.</i>
G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
G-GM.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

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SWDs:

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Marking Period 3

Topic and Essential Question

Unit 5 – (1) What is the mid-segment theorem? (2) What are the properties of perpendicular bisectors/angle bisectors/medians/altitudes of a triangle? (3) What is the circumcenter/incenter/centroid/orthocenter of a triangle? (4) How do we construct perpendicular bisectors/angle bisectors/medians/altitudes in a triangle? (5) What is the Triangle inequality theorem? (6) How do we do indirect proof?

Unit 6 – (1) How do we solve problems involving ratios, proportions and the geometric mean? (2) What are the properties of similar polygons? (3) How do we prove triangles similar by AAA/AA/SSS/SAS Similarity Postulate/Theorem? (4) What is the Triangle proportionality Theorem?

Unit/Topics **Unit 5 – Relationships of special segments in triangles**

Unit 6 – Similar triangles

SWBAT/Objectives **Unit 5 – 18 days** Students will be able to...

- Apply and prove properties of midsegments in triangles
- Use variables as coordinates, and perform basic coordinate proofs using slopes or lengths
- Apply the properties of perpendicular bisectors and construct the circumcenter of a triangle
- Apply the properties of angle bisectors and construct the incenter of a triangle
- Apply the properties of medians and construct the centroid of a triangle
- Apply the properties of altitudes and construct the orthocenter of a triangle

Unit 6 – 10 days Students will be able to...

- Model problems using ratios, proportions, and calculate the geometric mean
- Match corresponding parts of similar figures
- Prove triangles are similar based on given information, or determine not enough information
- Find lengths of whole or partial sides, or the measures of angles, of similar triangles

Vocabulary/Key Terms

Unit 5: midsegment, coordinate proof, perpendicular bisectors, equidistant, concurrent, point of concurrency, circumcenter, circumscribe, construct, angle bisector, incenter, median, centroid, center of mass, altitudes, orthocenter, Hinge Theorem, indirect proof, proof by contradiction

Unit 6: ratio, simplest form, equivalent ratios, proportion, geometric mean, reciprocal property, scale drawing, similar, scale factor, AAA/AA/SSS/SAS Similarity, Triangle Proportionality Theorem

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Common Core Standards:

Common Core Standards for Math Practices:
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G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
G-CO.10	Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i>
G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i>
G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
G-C.1	Prove that all circles are similar.
G-C.3	Construct the inscribed and circumscribed circles of a triangle.
G-MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).
G-SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor:

	<p>a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.</p> <p>b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.</p>
G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
G-SRT.4	Prove theorems about triangles. <i>Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.</i>
G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

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