

Monroe County Schools

Geometry

2015 - 2016

Overview

Content Standard Domains and Clusters

Congruence [G-CO]

- Experiment with transformations in the plane.
- Understand congruence in terms of rigid motions.
- Prove geometric theorems.
- Make geometric constructions.

Similarity, Right Triangles, and Trigonometry [G-SRT]

- Understand similarity in terms of similarity transformations.
- Prove theorems involving similarity.
- Define trigonometric ratios and solve problems involving right triangles.
- Apply trigonometry to general triangles.

Circles [G-C]

- Understand and apply theorems about circles.
- Find arc lengths and areas of sectors of circles.

Expressing Geometric Properties With Equations [G-GPE]

- Translate between the geometric description and the equation for a conic section.
- Use coordinates to prove simple geometric theorems algebraically.

Geometric Measurement and Dimension [G-GPE]

- Explain volume formulas and use them to solve problems.
- Visualize relationships between two-dimensional and three-dimensional objects.

Modeling With Geometry [G-MG]

- Apply geometric concepts in modeling situations

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
August				
August	<p>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-CO1]</p> <p>ACT</p>	undefined term, point, line, plane, collinear, coplanar, segment, endpoint, ray, opposite rays, postulate, coordinate, distance, length, congruent segments, construction, between, midpoint, bisect, segment, bisector, angle, vertex, interior of an angle, exterior of an angle, measure, degree, acute angle, right angle, obtuse angle, straight angle, congruent angles, angle bisector, adjacent angles, linear pair, complementary angles, supplementary angles, vertical angles, inductive reasoning, conjecture, counter example, hypothesis, conclusion, truth value, negation, converse, inverse, contra positive, proof, theorem, two column proof, flowchart proof, paragraph proof	Chapter 2- Basic Concepts 1.1 – 1.4	Formative 1 Exclude polygons and circles.
	<p>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; and points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i> [G-CO9]</p>		Chapter 2- Basic Concepts 1.1 – 1.4	Formative 1 Exclude highlighted part of the standard.
	<p>12. Make formal geometric constructions with a variety of tools and methods such as compass and straightedge, string, reflective devices, paper folding, and dynamic geometric software. <i>Constructions include 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-CO12]</p>		Chapter 2- Basic Concepts 1.1 – 1.4	Formative 1 Minimum amount of constructions; not many questions
Notes:	Please note highlighted areas and notations for formatives.			

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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
September				
September	<p>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; and points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i> [G-CO9] ACT</p>	<p>side of a polygon, vertex of a polygon, diagonal, regular polygon, concave, convex, parallelogram</p>	<p>Chapter 3 4.2 – 4.5, 1.6</p>	<p>Formative 2 Exclude highlighted part of standard.</p>
	<p>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, and the medians of a triangle meet at a point.</i> [G-CO10] ACT</p>		<p>Chapter 3 4.2 – 4.5, 1.6</p>	<p>Formative 2</p>
	<p>12. Make formal geometric constructions with a variety of tools and methods such as compass and straightedge, string, reflective devices, paper folding, and dynamic geometric software. <i>Constructions include 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-CO12]</p>		<p>Chapter 3 4.2 – 4.5, 1.6</p>	<p>Formative 2 Minimum amount of constructions. Not many questions.</p>
	<p>31. 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-GPE5] ACT</p>		<p>Chapter 3 4.2 – 4.5, 1.6</p>	<p>Formative 2</p>
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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
October				
October	<p>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-CO7]</p> <p>ACT</p>	<p>included side, CPCTC, coordinate proof, legs of an isosceles triangle, vertex angle, base, base angles, equidistant, locus, concurrent, point of concurrency, circumcenter of a triangle, circumscribed, incenter of a triangle, inscribed, median of a triangle, centroid of a triangle, altitude of a triangle, orthocenter of a triangle, midsegment of a triangle, indirect proof, Pythagorean triple</p>	<p>4.6 – 4.9 Chapter 5</p>	Formative 2
	<p>8. Explain how the criteria for triangle congruence, angle-side-angle (ASA), side-angle-side (SAS), and side-side-side (SSS), follow from the definition of congruence in terms of rigid motions. [G-CO8]</p> <p>ACT</p>		<p>4.6 – 4.9 Chapter 5</p>	Formative 2
	<p>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, and the medians of a triangle meet at a point.</i> [G-CO10]</p> <p>ACT</p>		<p>4.6 – 4.9 Chapter 5</p>	Formative 2
	<p>12. Make formal geometric constructions with a variety of tools and methods such as compass and straightedge, string, reflective devices, paper folding, and dynamic geometric software. <i>Constructions include 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-CO12]</p>		<p>4.6 – 4.9 Chapter 5</p>	Formative 2 Minimum amount of construction. Not many questions.
	<p>17. Prove theorems about triangles. <i>Theorems include a line parallel to one side of a triangle divides the other two proportionally, and conversely; and the Pythagorean Theorem proved using triangle similarity.</i> [G-SRT4]</p> <p>ACT</p>		<p>4.6 – 4.9 Chapter 5</p>	Formative 3

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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
October (continued)				
October (continued)	18. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. [G-SRT5] ACT		4.6 – 4.9 Chapter 5	Formative 3
	21. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.* [G-SRT8] ACT		4.6 – 4.9 Chapter 5	Formative 2 Only test Pythagorean Theorem
	30. Use coordinates to prove simple geometric theorems algebraically. [G-GPE4] 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 $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$. ACT		4.6 – 4.9 Chapter 5	Formative 2 Only test polygons – no circles
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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
November				
November	11. Prove theorems about parallelograms. <i>Theorems include opposite sides are congruent, opposite angles are congruent; the diagonals of a parallelogram bisect each other; and conversely, rectangles are parallelograms with congruent diagonals.</i> [G-CO11] ACT	side of a polygon, vertex of a polygon, diagonal, regular polygon, concave, convex, parallelogram	6.1 – 6.3	Formative 2
	31. 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-GPE5] ACT		6.1 – 6.3	Formative 2
	40. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, British Thermal Units (BTUs) per cubic foot).* [G-MG2] ACT		6.1 – 6.3	Formative 4
Notes				

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December				
December	11. Prove theorems about parallelograms. <i>Theorems include opposite sides are congruent, opposite angles are congruent; the diagonals of a parallelogram bisect each other; and conversely, rectangles are parallelograms with congruent diagonals.</i> [G-CO11] ACT	rectangle, rhombus, square, kite, trapezoid, base of a trapezoid, base angle of a trapezoid, leg of a trapezoid, isosceles trapezoid, midsegment of a trapezoid	6.4 – 6.6	Formative 2
	31. 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-GPE5] ACT		6.4 – 6.6	Formative 2
Notes:				
1st Semester Notes:				

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January				
January	14. Verify experimentally the properties of dilations given by a center and a scale factor. [G-SRT1]	similar, similar polygons, similarity, ration, similarity transformation, indirect measurement, scale drawing, geometric mean, trigonometric ration, sine, cosine, tangent, angle of elevation, angle of depression	7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	14a. 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. [G-SRT1a]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	14b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor. [G-SRT1b]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	15. 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-SRT2]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	16. Use the properties of similarity transformations to establish the angle-angle (AA) criterion for two triangles to be similar. [G-SRT3]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3

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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
January (continued)				
January (continued)	18. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. [G-SRT5]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	19. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle leading to definitions of trigonometric ratios for acute angles. [G-SRT6]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	20. Explain and use the relationship between the sine and cosine of complementary angles. [G-SRT7]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	21. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.* [G-SRT8]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 3
	40. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, British Thermal Units (BTUs) per cubic foot).* [G-MG2]		7.1, 7.3 – 7.5, 8.1 – 8.4	Formative 4
Notes:				


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February				
February	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-CO2]	dilation, scale factor, isometry, composition of transformations, glide reflection, symmetry, line symmetry, line of symmetry, rotational symmetry, translation, symmetry, frieze pattern, glide reflection symmetry, tessellation, regular tessellation, semiregular tessellation, center of dilation, enlargement, reduction	8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. [G-CO3]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. [G-CO4]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	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-CO5]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	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-CO6]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3


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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
February (continued)				
February	22. (+) Prove the Law of Sines and the Law of Cosines and use them to solve problems. [G-SRT10]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	23. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). [G-SRT11]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	24. Prove that all circles are similar. [G-C1]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
	32. Find the point on a directed line segment between two given points that partitions the segment in a given ratio. [G-GPE6]		8.5, Chapter 9, 1.7, 4.1, 7.2 – 7.6	Formative 3
Notes:				

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March				
March	33. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.* [G-GPE7]	circle, center of a circle, center of a regular polygon, apothem, central angle of a regular polygon, composite figure, geometric probability	1.5 Chapter 10.1 – 10.5	Formative 4
	34. Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics. 		1.5 Chapter 10.1 – 10.5	Formative 4
Notes:				

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April & May				
April & May	35. Give an informal argument for the formulas for the circumference of a circle; area of a circle; and volume of a cylinder, pyramid, and cone. <i>Use dissection arguments, Cavalieri's principle, and informal limit arguments.</i> [G-GMD1]	fare, edge, vertex, prism, cylinder, pyramid, cone, cube, net, cross section, volume, sphere, center of a sphere, radius of a sphere, hemisphere, great circle, interior of a circle, exterior of a circle, chord, secant, tangent of a circle, point of tangency, congruent circles, concentric circles, tangent circles, common tangent, central angle, arc, minor arc, major arc, semicircle, adjacent arcs, congruent arcs, sector of a circle, segment of a circle, arc length, inscribed angle, intercepted arc, subtend secant segment, intercepted arc, subtend secant segment, external secant segment, tangent segment	Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	Formative 4
	36. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.* [G-GMD3]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	Formative 4
	37. Determine the relationship between surface areas of similar figures and volumes of similar figures. 		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	Formative 4
	38. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. [G-GMD4]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	Formative 4
	39. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).* [G-MG1]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	Formative 4
Notes:				

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Month Introduced	2013 AL COS Standards	Vocabulary	Resources	Date Tested
Standards Not Paced -- (Resources were listed on a previous pacing guide for some of these standards)				
Standards Not Paced	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. [G-CO13]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	
	25. Identify and describe relationships among inscribed angles, radii, and chords. <i>Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</i> [G-C2]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	
	26. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. [G-C3]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	
	27. (+) Construct a tangent line from a point outside a given circle to the circle. [G-C4]		Chapter 11 12.1 – 12.4, 12.5 – 12.7, 10.6	
	28. Derive, using similarity, the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. [G-C5]		12.5 – 12.7, 10.6	

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Standards Not Paced	29. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. [G-GPE1]		12.5 – 12.7, 10.6	
	41. 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-MG3]		1.5 Chapter 10.1 – 10.5	
	42. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). [S-MD6]			
	43. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game). [S-MD7]			

APPENDIX A
2013 Revised Alabama Course of Study: Mathematics 126
TABLE 1*
ADDITION AND SUBTRACTION SITUATIONS

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Assessment Schedule

1st Nine Weeks	2nd Nine Weeks	3rd Nine Weeks	4th Nine Weeks
AL CCRS Standards	AL CCRS Standards	AL CCRS Standards	AL CCRS Standards
<p>1 – Omit polygons and circles</p> <p>9 – No more than two 2-column proofs..Omit points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.</p> <p>12 Minimum amount of constructions. Not many questions – no more than 2 construction questions limited to bisecting lines and constructing angles.</p>	<p>7</p> <p>8</p> <p>10</p> <p>11</p> <p>21- only Pythagorean Theorem</p> <p>30 – Polygons only, no circles</p> <p>31</p>	<p>3</p> <p>6</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>21</p> <p>23</p> <p>32</p>	<p>25</p> <p>26</p> <p>27</p> <p>28</p> <p>29</p> <p>33</p> <p>34</p> <p>35</p> <p>36</p> <p>37</p> <p>38</p> <p>39</p> <p>40</p> <p>41</p>

STIAchievement Services will **NOT** create formatives.



May 2015