AMSCO
a division of Perfection Learning

Indiana Geometry skills correlated to AMSCO Geometry lessons

Geometry Strand	No.	Skill	AMSCO GEO
LOGIC AND PROOFS	G.LP.1	Understand and describe the structure of and relationships within an axiomatic system (undefined terms, definitions, axioms and postulates, methods of reasoning, and theorems). Understand the differences among supporting evidence, counterexamples, and actual proofs.	1.1, 1.4, 3.1, 3.2, 3.3, 3.4
	G.LP.2	Know precise definitions for angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.	R.10, 1.1, 1.2, 4.1
	G.LP.3	State, use, and examine the validity of the converse, inverse, and contrapositive of conditional ("if – then") and bi-conditional ("if and only if") statements.	3.1
	G.LP.4	Develop geometric proofs, including direct proofs, indirect proofs, proofs by contradiction and proofs involving coordinate geometry, using two-column, paragraphs, and flow charts formats.	1.4, 3.1, 3.2, 3.3, 5.4, 6.7
ANGLES AND PLANES	G.PL.1:	Identify, justify, and apply properties of planes.	1.1
	G.PL.2	Describe the intersection of two or more geometric figures in the same plane.	4.1, 8.1, 10.4
	G.PL.3	Prove and apply theorems about lines and angles, including the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent; when a transversal crosses parallel lines, same side interior angles are supplementary; and points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.	4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 6.1, 6.2, 6.3
	G.PL.4	Know that parallel lines have the same slope and perpendicular lines have opposite reciprocal slopes. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in coordinate graphs and in equations. Find the equation of a line, passing through a given point that is parallel or perpendicular to a given line.	4.3, 4.4, 4.5
	G.PL.5	Explain and justify the process used to construct, with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.), congruent segments and angles, angle bisectors, perpendicular bisectors, altitudes, medians, and parallel and perpendicular lines.	1.1, 4.3, 5.1, 6.2, 8.1, 8.3, 9.6, enrichment masters 5.3 and 9.6 in teacher manual, see student edition p. 639.

TRIANGLES	G.T.1	Prove and apply theorems about triangles, including the following: 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; a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem, using triangle similarity; and the isosceles triangle theorem and its converse.	R.11, 4.5, 5.1, 6.1, 6.4, 7.1, 7.2, 7.3, 7.4
	G.T.2	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	1.3, 5.4
	G.T.3	Explain and justify the process used to construct congruent triangles with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	5.1, 5.3
	G.T.4	Given two triangles, 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, and to establish the AA criterion for two triangles to be similar.	2.4, 7.1
	G.T.5	Use properties of congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.	7.2, 7.4
	G.T.6	Prove and apply the inequality theorems, including the following: triangle inequality, inequality in one triangle, and the hinge theorem and its converse.	6.6
	G.T.7	State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle. Understand and use the geometric mean to solve for missing parts of triangles.	6.4
	G.T.8	Develop the distance formula using the Pythagorean Theorem. Find the lengths and midpoints of line segments in one- or two-dimensional coordinate systems. Find measures of the sides of polygons in the coordinate plane; apply this technique to compute the perimeters and areas of polygons in real-world and mathematical problems.	1.2, 9.6
	G.T.9	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.	7.6
	G.T.10	Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.	7.3, 7.4, 7.6, 7.7
	G.T.11	Use special right triangles (30° - 60° and 45° - 45°) to solve real-world and mathematical problems.	7.5

QUADRILATERALS AND OTHER POLYGONS	G.QP.1	Prove and apply theorems about parallelograms, including the following: opposite sides are congruent; opposite angles are congruent; the diagonals of a parallelogram bisect each other; and rectangles are parallelograms with congruent diagonals.	9.1, 9.3
	G.QP.2	Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.	9.2, 9.5, 9.6
	G.QP.3	Find measures of interior and exterior angles of polygons. Explain and justify the method used.	9.1, 9.2, 9.3, 9.4
	G.QP.4	Identify types of symmetry of polygons, including line, point, rotational, and self-congruencies.	1.5, 1.6
	G.QP.5:	Deduce formulas relating lengths and sides, perimeters, and areas of regular polygons. Understand how limiting cases of such formulas lead to expressions for the circumference and the area of a circle.	8.1
CIRCLES	G.CI.1	Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, and congruent concentric circles.	8.1, 8.2, 8.3, 8.4, 8.5
	G.CI.2	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius; derive the formula for the area of a sector.	8.2, 8.5
	G.CI.3	Identify and describe relationships among inscribed angles, radii, and chords, including the following: the relationship that exists between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; and the radius of a circle is perpendicular to a tangent where the radius intersects the circle.	8.4
	G.CI.4	Solve real-world and other mathematical problems that involve finding measures of circumference, areas of circles and sectors, and arc lengths and related angles (central, inscribed, and intersections of secants and tangents).	8.1, 8.2, 8.3, 8.4, 8.5
	G.CI.5	Construct a circle that passes through three given points not on a line and justify the process used.	8.1
	G.CI.6	Construct a tangent line to a circle through a point on the circle, and construct a tangent line from a point outside a given circle to the circle; justify the process used for each construction.	8.1
	G.CI.7	Construct the inscribed and circumscribed circles of a triangle with or without technology, and prove properties of angles for a quadrilateral inscribed in a circle.	8.1

TRANSFORMATIONS	G.TR.1	Use geometric descriptions of rigid motions to transform figures and to predict and describe the results of translations, reflections and rotations on a given figure. Describe a motion or series of motions that will show two shapes are congruent.	1.3, 1.4, 1.5, 1.6, 1.7, 2.4
	G.TR.2	Understand 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. Verify experimentally the properties of dilations given by a center and a scale factor. Understand the dilation of a line segment is longer or shorter in the ratio given by the scale factor.	2.2, 2.3, 2.4
THREE-DIMENSIONAL SOLIDS	G.TS.1	Describe relationships between the faces, edges, and vertices of three-dimensional solids. Create a net for a given three-dimensional solid. Describe the three-dimensional solid that can be made from a given net (or pattern).	10.1, 10.2
	G.TS.2	Describe symmetries of three-dimensional solids.	10.3
	G.TS.3	Know properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres; solve problems involving congruent and similar solids.	1.5
	G.TS.4	Describe sets of points on spheres, including chords, tangents, and great circles.	Not covered
	G.TS.5	Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve algebraic expressions.	10.2, 10.3
	G.TS.6	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).	10.2, 10.3
	G.TS.7	Graph points on a three-dimensional coordinate plane. Explain how the coordinates relate the point as the distance from the origin on each of the three axes.	10.1
	G.TS.8	Determine the distance of a point to the origin on the three-dimensional coordinate plane using the distance formula.	10.1
	G.TS.9	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	10.1