Indiana Academic Standards Geometry Crosswalk

2014 Standard Language	2020 Standard Language	Changes
Geometry		
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.	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.	No change
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.	G.LP.2: Use precise definitions for angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, and plane. Use standard geometric notation.	Language change Changed “know” to “use” Made perpendicular and parallel line plural
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.	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.	No change
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.	G.LP.4: Understand that proof is the means used to demonstrate whether a statement is true or false mathematically. Develop geometric proofs, including those involving coordinate geometry, using two-column,	Language change Added “Understand that proof is the means used to demonstrate whether a statement is true or false mathematically” Removed “direct proofs, indirect

	paragraph, and flow chart formats.	proofs, proofs by contradiction and”
Points, Lines, angles, and Planes		
G.PL.1: Identify, justify, and apply properties of planes.		Removed standard
G.PL.2: Describe the intersection of two or more geometric figures in the same plane.		Removed standard
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.	G.PL.1: Prove and apply theorems about lines and angles, including the following: a. Vertical angles are congruent. b. When a transversal crosses parallel lines, alternate interior angles are congruent, alternate exterior angles are congruent, and corresponding angles are congruent. c. When a transversal crosses parallel lines, same side interior angles are supplementary. d. Points on a perpendicular bisector of a line segment are exactly those equidistant from the endpoints of the segment.	Indicator change Created lettered list for ease of reading
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	G.PL.2: Explore the relationships of the slopes of parallel and perpendicular lines. Determine if a pair of lines are parallel, perpendicular, or neither by comparing the slopes in	Indicator change Language change Changed “Know that parallel lines have the same slope and perpendicular lines have

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.	coordinate graphs and equations.	opposite reciprocal slopes" to "Explore the relationships of the slopes of parallel and perpendicular lines" Removed " Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line" (Added to 2020 AI.L.3)
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.	G.PL.3: Use tools to explain and justify the process to construct congruent segments and angles, angle bisectors, perpendicular bisectors, altitudes, medians, and parallel and perpendicular lines.	Indicator change Language change Removed list of potential tools
	G.PL.4: Develop the distance formula using the Pythagorean Theorem. Find the lengths and midpoints of line segments in the two-dimensional coordinate system.	New standard Adapted from 2014 G.T.8
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;	G.T.1: Prove and apply theorems about triangles, including the following: a. ●Measures of interior angles of a triangle sum to 180°. b. The Isosceles Triangle Theorem and its converse. c. The Pythagorean Theorem.	Language change Created lettered list for ease of reading Removed "base angles of isosceles triangles are congruent" Removed " the medians of a

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.	d. The segment joining midpoints of two sides of a triangle is parallel to the third side and half the length. e. A line parallel to one side of a triangle divides the other two proportionally, and its converse. f. The Angle Bisector Theorem.	triangle meet at a point" Changed "the Pythagorean Theorem, using triangle similarity" to "the Pythagorean Theorem" Added "The Angle Bisector Theorem"
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.	G.T.2: Explore and explain how the criteria for triangle congruence (ASA, SAS, AAS, SSS, and HL) follow from the definition of congruence in terms of rigid motions.	Language change Added "AAS" and "HL"
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.).	G.T.3: Use tools to explain and justify the process to construct congruent triangles.	Language change Removed list of potential tools
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.	G.T.4: Use the definition of similarity in terms of similarity transformations, to determine if two given triangles are similar. Explore and develop the meaning of similarity for triangles.	Language change Removed "Given two triangles" Changed "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." to "Explore and develop the meaning of similarity for

		triangles”
G.T.5: Use properties of congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.	G.T.5: Use congruent and similar triangles to solve real-world and mathematical problems involving sides, perimeters, and areas of triangles.	Language change Removed “properties of”
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.	G.T.6: Prove and apply the inequality theorems, including the following: a. Triangle inequality. b. Inequality in one triangle. c. The hinge theorem and its converse.	Created lettered list for ease of reading
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.	G.T.7: Explore 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.	Language change Changed “State and apply “ to “Explore”
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.		Removed standard Moved part to 2020 G.PL.4 and part to 2020 G.QP.5
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	G.T.8: Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric	Indicator change No language change

ratios for acute angles.	ratios for acute angles.	
G.T.10: Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.	G.T.9: Use trigonometric ratios (sine, cosine and tangent) and the Pythagorean Theorem to solve real-world and mathematical problems involving right triangles.	Indicator change No language change
G.T.11: Use special right triangles (30° - 60° and 45° - 45°) to solve real-world and mathematical problems.	G.T.10: Explore the relationship between the sides of special right triangles (30° - 60° and 45° - 45°) and use them to solve real-world and other mathematical problems.	Indicator change Language change Changed “Use” to “Explore the relationship between the sides of”
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.	G.QP.1: Prove and apply theorems about parallelograms, including those involving angles, diagonals, and sides.	Language change Changed “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” to “ including those involving angles, diagonals, and sides”
G.QP.2: Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.	G.QP.2: Prove that given quadrilaterals are parallelograms, rhombuses, rectangles, squares, kites, or trapezoids. Include coordinate proofs of quadrilaterals in the coordinate plane.	Language change Added “kites”
G.QP.3: Find measures of interior and exterior angles of polygons. Explain and justify	G.QP.3: Develop and use formulas to find measures of interior and exterior angles of	Language change Changed “find” to “develop and

the method used.	polygons.	use” Removed “Explain and justify the method used”
G.QP.4: Identify types of symmetry of polygons, including line, point, rotational, and self-congruencies.	G.QP.4: Identify types of symmetry of polygons, including line, point, rotational, and self-congruencies.	No change
	G.QP.5: Compute perimeters and areas of polygons in the coordinate plane to solve real-world and other mathematical problems.	New standard Moved from second part of 2014 G.T.8
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.	G.QP.6: Develop and use formulas for areas of regular polygons.	Indicator change Language change Changed “Deduce formulas relating lengths and sides, perimeters, and areas” to “ Develop and use formulas for areas” Removed “Understand how limiting cases of such formulas lead to expressions for the circumference and the area of a circle“
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.	G.CI.1: Define, identify and use relationships among the following: radius, diameter, arc, measure of an arc, chord, secant, tangent, congruent circles, and concentric circles.	Language change Changed “and congruent concentric circles.” to “congruent circles, and concentric circles“
G.CI.2: Derive using similarity the fact that the length of the	G.CI.2: Derive the fact that the length of the arc intercepted	Language change

arc intercepted by an angle is proportional to the radius; derive the formula for the area of a sector.	by an angle is proportional to the radius; derive the formula for the area of a sector.	Removed “using similarity”
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.	G.CI.3: Explore and use relationships among inscribed angles, radii, and chords, including the following: a. The relationship that exists between central, inscribed, and circumscribed angles. b. Inscribed angles on a diameter are right angles. c. The radius of a circle is perpendicular to a tangent where the radius intersects the circle.	Language change Created lettered list for ease of reading Changed “Identify and describe” to “Explore and use”
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).	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).	No change
G.CI.5: Construct a circle that passes through three given points not on a line and justify the process used.	G.CI.5: Use tools to explain and justify the process to construct a circle that passes through three given points not on a line, a tangent line to a circle through a point on the circle, and a tangent line from a point outside a given circle to the circle.	Language change Combined 2014 G.CI.5 and 2014 G.GI.6
G.CI.6: Construct a tangent line to a circle through a point on the circle, and construct a tangent line from a point		Removed standard Added to 2020 G.CI.5

outside a given circle to the circle; justify the process used for each construction.		
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.	G.CI.6: Use tools to construct the inscribed and circumscribed circles of a triangle. Prove properties of angles for a quadrilateral inscribed in a circle.	Indicator change Language change Added “use tools to” Removed “with or without technology”
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.	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.	No change
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.	G.TR.2: 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.	Language change Removed “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”
Three-Dimensional Solids		
G.TS.1: Describe relationships between the faces, edges, and	G.TS.1: Create a net for a given three-dimensional solid.	Language change

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).	Describe the three-dimensional solid that can be made from a given net (or pattern).	Removed " Describe relationships between the faces, edges, and vertices of three-dimensional solids"
G.TS.2: Describe symmetries of three-dimensional solids.	G.TS.2: Explore and use symmetries of three-dimensional solids to solve problems.	Language change Changed "Describe" to "Explore and use" Added "to solve problems"
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.	G.TS.3: Explore properties of congruent and similar solids, including prisms, regular pyramids, cylinders, cones, and spheres and use them to solve problems.	Language change Changed "know" to "explore"
G.TS.4: Describe sets of points on spheres, including chords, tangents, and great circles.		Removed standard
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.	G.TS.4: Solve real-world and other mathematical problems involving volume and surface area of prisms, cylinders, cones, spheres, and pyramids, including problems that involve composite solids and algebraic expressions.	Indicator change Language change Added "composite solids"
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).	G.TS.5: Apply geometric methods to create and solve design problems.	Indicator change Language change Added "create" Removed "(e.g., designing an object or structure to satisfy

		physical constraints or minimize cost; working with typographic grid systems based on ratios)”
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.		Removed standard
G.TS.8: Determine the distance of a point to the origin on the three-dimensional coordinate plane using the distance formula.		Removed standard
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.		Remove standard