Geometry *Standards of Learning* - 2023 Overview of Revisions

This overview includes a summary of the content embedded in four content strands.

Reasoning, Lines, and Transformations
- Translate, construct, and judge the validity of a logical argument and use and interpret Venn diagrams
- Analyze the relationships of parallel lines cut by a transversal
- Solve problems, including contextual problems, involving symmetry and transformation

Triangles
- Determine the relationships between the measures of angles and lengths of sides in triangles, including problems in context.
- Prove two triangles are congruent and solve contextual problems involving measured attributes of congruent triangles
- Given a triangle, use geometric constructions to create a congruent triangle
- Prove triangles are similar and solve contextual problems involving measured attributes of similar triangles
- Solve problems, including contextual problems, involving trigonometry in right triangles and applications of the Pythagorean Theorem

Polygons and Circles
- Prove and justify theorems and properties of quadrilaterals, and verify and use properties of quadrilaterals, including the relationships between the sides, angles, and diagonals, to solve problems, including those in context
- Use geometric constructions to verify properties of quadrilaterals
- Verify relationships and solve problems, including contextual problems, involving the number of sides and angles of convex polygons
- Solve problems, including those in context, by applying properties of circles
- Solve problems in the coordinate plane, including those in context, involving equations of circles

Two- and Three-Dimensional Figures
- Create models and solve problems, including those in context, involving surface area and volume of three-dimensional objects
- Determine the effects of changing one or more dimensions of a three-dimensional figure, including recognizing when two- and three-dimensional figures are similar

Comparison of Geometry Mathematics *Standards of Learning* – 2016 to 2023

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Reasoning, Lines, and Transformations**	2023 *Standards of Learning* Knowledge and Skills (KS) **Reasoning, Lines and Transformations (RLT)**
G.1 The student will use deductive reasoning to construct and judge the validity of a logical argument consisting of a set of premises and a conclusion. This will include **a) identifying the converse, inverse, and contrapositive of a conditional statement;** **b) translating a short verbal argument into symbolic form; and** **c) determining the validity of a logical argument.** • Identify the converse, inverse, and contrapositive of a conditional statement. (a) • Translate verbal arguments into symbolic form using the symbols of formal logic. (b) • Determine the validity of a logical argument using valid forms of deductive reasoning. (c) • Determine that an argument is false using a counterexample. (c)	**G.RLT.1 The student will translate, construct, and judge the validity of a logical argument and use and interpret Venn diagrams.** a) Translate propositional statements and compound statements into symbolic form, including negations ($\sim p$, read "*not p*"), conjunctions ($p \wedge q$, read "*p and q*"), disjunctions ($p \vee q$, read "*p or q*"), conditionals ($p \rightarrow q$, read "*if p then q*"), and biconditionals ($p \leftrightarrow q$, read "*p if and only if q*"), including statements representing geometric relationships. b) Identify and determine the validity of the converse, inverse, and contrapositive of a conditional statement, and recognize the connection between a biconditional statement and a true conditional statement with a true converse, including statements representing geometric relationships. c) Use Venn diagrams to represent set relationships, including union, intersection, subset, and negation. d) Interpret Venn diagrams, including those representing contextual situations.

G.2 The student will use the relationships between angles formed by two lines intersected by a transversal to
a) prove two or more lines are parallel; and
b) solve problems, including practical problems, involving angles formed when parallel lines are intersected by a transversal.
	G.RLT.2 The student will analyze the relationships of parallel lines cut by a transversal.
	
	a) Prove and justify angle pair relationships formed by two parallel lines and a transversal, including
	  i) corresponding angles;
	  ii) alternate interior angles;

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Reasoning, Lines, and Transformations**	2023 *Standards of Learning* Knowledge and Skills (KS) **Reasoning, Lines and Transformations (RLT)**
• Prove two or more lines are parallel given angle measurements expressed numerically or algebraically. (a) • Prove two lines are parallel using deductive proofs given relationships between and among angles. (a) • Solve problems by using the relationships between pairs of angles formed by the intersection of two parallel lines and a transversal including corresponding angles, alternate interior angles, alternate exterior angles, same-side (consecutive) interior angles, and same-side (consecutive) exterior angles. (b) • Solve problems, including practical problems, involving intersecting and parallel lines. (b)	iii) alternate exterior angles; iv) same-side (consecutive) interior angles; and v) same-side (consecutive) exterior angles. b) Prove two or more lines are parallel given angle measurements expressed numerically or algebraically. c) Solve problems by using the relationships between pairs of angles formed by the intersection of two parallel lines and a transversal.
G.3 The student will solve problems involving symmetry and transformation. This will include a) **investigating and using formulas for determining distance, midpoint, and slope;** b) **applying slope to verify and determine whether lines are parallel or perpendicular;** c) **investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and** d) **determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.** • Determine the coordinates of the midpoint or endpoint of a segment, using the midpoint formula. (a) • Use a formula to determine the slope of a line. (a) • Apply the distance formula to determine the length of a line segment when given the coordinates of the endpoints. (a)	**G.RLT.3 The student will solve problems, including contextual problems, involving symmetry and transformation.** a) Locate, count, and draw lines of symmetry given a figure, including figures in context. b) Determine whether a figure has point symmetry, line symmetry, both, or neither, including figures in context. c) Given an image or preimage, identify the transformation or combination of transformations that has/have occurred. Transformations include: i) translations; ii) reflections over any horizontal or vertical line or the lines $y = x$ or $y = -x$; iii) clockwise or counterclockwise rotations of 90°, 180°, 270°, or 360° on a coordinate grid where the center of rotation is limited to the origin; and

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Reasoning, Lines, and Transformations**	2023 *Standards of Learning* Knowledge and Skills (KS) **Reasoning, Lines and Transformations (RLT)**

• Compare the slopes to determine whether two lines are parallel, perpendicular, or neither. (b)
• Determine whether a figure has point symmetry, line symmetry, both, or neither. (c)
• Given an image and preimage, identify the transformation or combination of transformations that has/have occurred. Transformations include:
   o a translation;
   o a reflection over any horizontal or vertical line or the lines $y = x$ or $y = -x;$
   o a clockwise or counterclockwise rotation of 90°, 180°, 270°, or 360° on a coordinate grid where the center of rotation is limited to the origin; and
   o dilations, from a fixed point on a coordinate grid.
	iv) dilations, from a fixed point on a coordinate grid.

G.4 The student will construct and justify the constructions of **a) a line segment congruent to a given line segment;** **b) the perpendicular bisector of a line segment;** **c) a perpendicular to a given line from a point not on the line;** **d) a perpendicular to a given line at a given point on the line;** **e) the bisector of a given angle;** **f) an angle congruent to a given angle;** **g) a line parallel to a given line through a point not on the line; and** **h) an equilateral triangle, a square, and a regular hexagon inscribed in a circle.** • Construct and justify the constructions of o a line segment congruent to a given line segment; (a)	**[Included in G.TR.2 and G.PC.1]**

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Reasoning, Lines, and Transformations**	2023 *Standards of Learning* Knowledge and Skills (KS) **Reasoning, Lines and Transformations (RLT)**
o the perpendicular bisector of a line segment; (b) o a perpendicular to a given line from a point not on the line; (c) o a perpendicular to a given line at a given point on the line; (d) o the bisector of a given angle; (e) o an angle congruent to a given angle; (f) o a line parallel to a given line through a point not on the given line; (g) and o an equilateral triangle, a square, and a regular hexagon inscribed in a circle. (h)	

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Triangles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Triangles (TR)**
G.5 The student, given information concerning the lengths of sides and/or measures of angles in triangles, will solve problems, including practical problems. This will include **a) ordering the sides by length, given angle measures;** **b) ordering the angles by degree measure, given side lengths;** **c) determining whether a triangle exists; and** **d) determining the range in which the length of the third side must lie.**	**G.TR.1 The student will determine the relationships between the measures of angles and lengths of sides in triangles, including problems in context.** a) Given the lengths of three segments, determine whether a triangle could be formed. b) Given the lengths of two sides of a triangle, determine the range in which the length of the third side must lie. c) Order the sides of a triangle by their lengths when given information about the measures of the angles.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Triangles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Triangles (TR)**
• Given information about the lengths of sides and/or measures of angles in triangles, solve problems, including practical problems. (a, b, c, d) • Order the sides of a triangle by their lengths when given information about the measures of the angles. (a) • Order the angles of a triangle by their measures when given information about the lengths of the sides. (b) • Given the lengths of three segments, determine whether a triangle could be formed. (c) • Given the lengths of two sides of a triangle, determine the range in which the length of the third side must lie. (d)	d) Order the angles of a triangle by their measures when given information about the lengths of the sides. e) Solve for interior and exterior angles of a triangle, when given two angles.
G.6 The student, given information in the form of a figure or statement, will prove two triangles are congruent. • Prove two triangles congruent given relationships among angles and sides of triangles expressed numerically or algebraically. • Prove two triangles congruent given representations in the coordinate plane and using coordinate methods (distance formula and slope formula). • Use direct proofs to prove two triangles congruent.	**G.TR.2 The student will, given information in the form of a figure or statement, prove two triangles are congruent using direct and indirect proofs, and solve problems involving measured attributes of congruent triangles.** a) Use definitions, postulates, and theorems (including Side-Side-Side (SSS); Side-Angle-Side (SAS); Angle-Side-Angle (ASA); Angle-Angle-Side (AAS); and Hypotenuse-Leg (HL)) to prove and justify two triangles are congruent. b) Use algebraic methods to prove that two triangles are congruent. c) Use coordinate methods, such as the slope formula and the distance formula, to prove two triangles are congruent. d) Given a triangle, use congruent segment, congruent angle, and/or perpendicular line constructions to create a congruent triangle (SSS, SAS, ASA, AAS, and HL).

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Triangles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Triangles (TR)**
G.7 The student, given information in the form of a figure or statement, will prove two triangles are similar. ● Prove two triangles similar given relationships among angles and sides of triangles expressed numerically or algebraically. ● Prove two triangles similar given representations in the coordinate plane and using coordinate methods (distance formula and slope formula). ● Use direct proofs to prove triangles similar.	**G.TR.3 The student will, given information in the form of a figure or statement, prove and justify two triangles are similar using direct and indirect proofs, and solve problems, including those in context, involving measured attributes of similar triangles.** a) Use definitions, postulates, and theorems (including Side-Angle-Side (SAS); Side-Side-Side (SSS); and Angle-Angle (AA)) to prove and justify that triangles are similar. b) Use algebraic methods to prove that triangles are similar. c) Use coordinate methods, such as the slope formula and the distance formula, to prove two triangles are similar. d) Describe a sequence of transformations that can be used to verify similarity of triangles located in the same plane. e) Solve problems, including those in context, involving attributes of similar triangles.
G.8 The student will solve problems, including practical problems, involving right triangles. This will include applying **a) the Pythagorean Theorem and its converse;** **b) properties of special right triangles; and** **c) trigonometric ratios.** ● Solve problems, including practical problems, using right triangle trigonometry and properties of special right triangles. (a, b, c) ● Determine whether a triangle formed with three given lengths is a right triangle. (a)	**G.TR.4 The student will model and solve problems, including those in context, involving trigonometry in right triangles and applications of the Pythagorean Theorem.** a) Determine whether a triangle formed with three given lengths is a right triangle. b) Find and verify trigonometric ratios using right triangles. c) Model and solve problems, including those in context, involving right triangle trigonometry (sine, cosine, and tangent ratios). d) Solve problems using the properties of special right triangle.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Triangles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Triangles (TR)**
• Solve for missing lengths in geometric figures, using properties of 45°-45°-90° triangles where rationalizing denominators may be necessary. (b) • Solve for missing lengths in geometric figures, using properties of 30°-60°-90° triangles where rationalizing denominators may be necessary. (b). • Solve problems, including practical problems, involving right triangles with missing side lengths or angle measurements, using sine, cosine, and tangent ratios. (c)	e) Solve for missing lengths in geometric figures, using properties of 45°-45°-90° triangles, where rationalizing denominators may be necessary. f) Solve for missing lengths in geometric figures, using properties of 30°-60°-90° triangles, where rationalizing denominators may be necessary. g) Solve problems, including those in context, involving right triangles using the Pythagorean Theorem and its converse, including recognizing Pythagorean Triples.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Polygons and Circles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Polygons and Circles (PC)**
G.9 The student will verify and use properties of quadrilaterals to solve problems, including practical problems. • Solve problems, including practical problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids. • Prove that quadrilaterals have specific properties, using coordinate and algebraic methods, such as the distance formula, slope, and midpoint formula. • Prove the properties of quadrilaterals, using direct proofs.	**G.PC.1 The student will prove and justify theorems and properties of quadrilaterals, and verify and use properties of quadrilaterals to solve problems, including the relationships between the sides, angles, and diagonals.** a) Solve problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids. b) Prove and justify that quadrilaterals have specific properties, using coordinate and algebraic methods, such as the slope formula, the distance formula, and the midpoint formula. c) Prove and justify theorems and properties of quadrilaterals using deductive reasoning.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Polygons and Circles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Polygons and Circles (PC)**
	d) Use congruent segment, congruent angle, angle bisector, perpendicular line, and/or parallel line constructions to verify properties of quadrilaterals.
G.10 The student will solve problems, including practical problems, involving angles of convex polygons. This will include determining the **a) sum of the interior and/or exterior angles;** **b) measure of an interior and/or exterior angle; and** **c) number of sides of a regular polygon.** ● Solve problems, including practical problems, involving angles of convex polygons. (a, b, c) ● Determine the sum of the measures of the interior and exterior angles of a convex polygon. (a) ● Determine the measure of each interior and exterior angle of a regular polygon. (b) ● Determine angle measures of a regular polygon in a tessellation. (b) ● Determine the number of sides of a regular polygon, given the measures of interior or exterior angles of the polygon. (c)	**G.PC.2 The student will verify relationships and solve problems involving the number of sides and angles of convex polygons.** a) Solve problems involving the number of sides of a regular polygon given the measures of the interior and exterior angles of the polygon. b) Justify the relationship between the sum of the measures of the interior and exterior angles of a convex polygon and solve problems involving the sum of the measures of the angles. c) Justify the relationship between the measure of each interior and exterior angle of a regular polygon and solve problems involving the measures of the angles.
G.11 The student will solve problems, including practical problems, by applying properties of circles. This will include determining **a) angle measures formed by intersecting chords, secants, and/or tangents;** **b) lengths of segments formed by intersecting chords, secants, and/or tangents;** **c) arc length; and**	**G.PC.3 The student will solve problems, including those in context, by applying properties of circles.** a) Determine the proportional relationship between the arc length or area of a sector and other parts of a circle.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Polygons and Circles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Polygons and Circles (PC)**

d) area of a sector.
 	
● Solve problems, including practical problems, by applying properties of circles. (a, b, c, d)
● Determine angle measures and arc measures associated with
   o two intersecting chords;
   o two intersecting secants;
   o an intersecting secant and tangent;
   o two intersecting tangents; and
   o central and inscribed angles. (a)
● Determine segment lengths associated with:
   o two intersecting chords;
   o two intersecting secants;
   o an intersecting secant and tangent; and
   o two intersecting tangents. (b)
● Calculate the length of an arc of a circle. (c)
● Calculate the area of a sector. (d)
	b) Solve for arc measures and angles in a circle formed by central angles.
	c) Solve for arc measures and angles in a circle involving inscribed angles.
	d) Calculate the length of an arc of a circle.
	e) Calculate the area of a sector of a circle.
	f) Apply arc length or sector area to solve for an unknown measurement of the circle including the radius, diameter, arc measure, central angle, arc length, or sector area.

G.12 The student will solve problems involving equations of circles. ● Given a graph or the equation of a circle in standard form, identify the coordinates of the center of the circle. ● Given the coordinates of the endpoints of a diameter of a circle, determine the coordinates of the center of the circle. ● Given a graph or the equation of a circle in standard form, identify the length of the radius or diameter of the circle.	**G.PC.4 The student will solve problems in the coordinate plane involving equations of circles.** a) Derive the equation of a circle given the center and radius using the Pythagorean Theorem. b) Solve problems in the coordinate plane involving equations of circles: i) given a graph or the equation of a circle in standard form, identify the coordinates of the center of the circle;

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Polygons and Circles**	2023 *Standards of Learning* Knowledge and Skills (KS) **Polygons and Circles (PC)**

- Given the coordinates of the endpoints of the diameter of a circle, determine the length of the radius or diameter of the circle. - Given the coordinates of the center and the coordinates of a point on the circle, determine the length of the radius or diameter of the circle. - Given the coordinates of the center and length of the radius of a circle, identify the coordinates of a point(s) on the circle. - Determine the equation of a circle given: - a graph of a circle with a center with coordinates that are integers; - coordinates of the center and a point on the circle; - coordinates of the center and the length of the radius or diameter; or - coordinates of the endpoints of a diameter.	ii) given the coordinates of the endpoints of a diameter of a circle, determine the coordinates of the center of the circle.
	
	iii) given a graph or the equation of a circle in standard form, identify the length of the radius or diameter of the circle.
	
	iv) given the coordinates of the endpoints of the diameter of a circle, determine the length of the radius or diameter of the circle.
	
	v) given the coordinates of the center and the coordinates of a point on the circle, determine the length of the radius or diameter of the circle; and
	
	vi) given the coordinates of the center and length of the radius of a circle, identify the coordinates of a point(s) on the circle.
	
	c) Determine the equation of a circle given:
	
	   i) a graph of a circle with a center with coordinates that are integers;
	
	   ii) coordinates of the center and a point on the circle;
	
	   iii) coordinates of the center and the length of the radius or diameter; and
	
	   iv) coordinates of the endpoints of a diameter.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Two- and Three- Dimensional Figures**	2023 *Standards of Learning* Knowledge and Skills (KS) **Two- and Three-Dimensional Figures (DF)**
G.13 The student will use surface area and volume of three-dimensional objects to solve practical problems. ● Determine the surface area of cylinders, prisms, pyramids, cones, hemispheres, and spheres, using the appropriate formulas. ● Determine the volume of cylinders, prisms, pyramids, cones, hemispheres, and spheres, using the appropriate formulas. ● Solve problems including practical problems, involving surface area and volume of cylinders, prisms, pyramids, cones, hemispheres, and spheres, as well as composite three-dimensional figures. ● Solve problems, including practical problems, involving the lateral area of circular cylinders, prisms, and regular pyramids. ● Given information about a three-dimensional figure such as length of a side, area of a face, or volume, determine missing information.	**G.DF.1 The student will create models and solve problems, including those in context, involving surface area and volume of rectangular and triangular prisms, cylinders, cones, pyramids, and spheres.** a) Identify the shape of a two-dimensional cross section of a three-dimensional figure. b) Create models and solve problems, including those in context, involving surface area of three-dimensional figures, as well as composite three-dimensional figures. c) Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite three-dimensional figures. d) Determine unknown measurements of three-dimensional figures using information such as length of a side, area of a face, or volume.
G.14 The student will apply the concepts of similarity to two- or three-dimensional geometric figures. This will include **a) comparing ratios between lengths, perimeters, areas, and volumes of similar figures;** **b) determining how changes in one or more dimensions of a figure affect area and/or volume of the figure;** **c) determining how changes in area and/or volume of a figure affect one or more dimensions of the figure; and** **d) solving problems, including practical problems, about similar geometric figures.**	**G.DF.2 The student will determine the effect of changing one or more dimensions of a three-dimensional geometric figure and describe the relationship between the original and changed figure.** a) Describe how changes in one or more dimensions of a figure affect other derived measures (perimeter, area, total surface area, and volume) of the figure. b) Describe how changes in surface area and/or volume of a figure affect the measures of one or more dimensions of the figure. c) Solve problems, including those in context, involving changing the dimensions or derived measures of a three-dimensional figure.

2016 *Standards of Learning* Essential Knowledge and Skills (EKS) **Two- and Three- Dimensional Figures**	2023 *Standards of Learning* Knowledge and Skills (KS) **Two- and Three-Dimensional Figures (DF)**
● Compare ratios between side lengths, perimeters, areas, and volumes, given two similar figures. (a) ● Describe how changes in one or more dimensions affect other derived measures (perimeter, area, surface area, and volume) of a figure. (b) ● Describe how changes in one or more measures (perimeter, area, surface area, and volume) affect other measures of a figure. (c) ● Solve real-world problems involving measured attributes of similar figures. (d)	d) Compare ratios between side lengths, perimeters, areas, and volumes of similar figures. e) Recognize when two- and three-dimensional figures are similar and solve problems, including those in context, involving attributes of similar geometric figures.

2023 Geometry Mathematics SOL – Summary of Changes

Geometry (2016 SOL to 2023 SOL Numbering)	Parameter Changes/Clarifications (2023 SOL)
- G.1 → G.RLT.1 - G.2 → G.RLT.2 - G.3a,b → [Included in G.TR.2, G.TR.3, G.PC.1, and G.PC.4] - G.3c,d → G.RLT.3 - G.4a-g → [Included in G.TR.2 and G.PC.1] - G.4h → [Deleted] - G.5 → G.TR.1 - G.6 → G.TR.2 - G.7 → G.TR.3 - G.8 → G.TR.4 - G.9 → G.PC.1 - G.10 → G.PC.2 - G.11 → G.PC.3 - G.12 → G.PC.4 - G.13 → G.DF.1 - G.14 → G.DF.2	- G.RLT.1 – Translate logic statements includes statements representing geometric relationships - G.RLT.2 – Prove and justify angle pair relationships formed by two parallel lines and a transversal - G.RLT.3 – Include figures in context when determining whether a figure has point symmetry, line symmetry, both, or neither - G.TR.2 - Use Hypotenuse-Leg (HL) to prove triangles are congruent - G.TR.4 - Recognize Pythagorean Triples - G.TR.4 – Model and solve problems involving right triangle trigonometry - G.PC.1 – Prove and justify theorems and properties of quadrilaterals - G.PC.2 – Verify and justify angle and side relationships in convex polygons - G.PC.4 – Solve problems in the coordinate plane involving circle equations - G.DF.1 – Create models and solve problems involving the surface area of three-dimensional figures, as well as composite figures - G.DF.1 – Solve multistep problems, including those in context, involving volume of three-dimensional figures, as well as composite figures

Deletions from Geometry (2016 SOL)	Additions to Geometry (2023 SOL)
- G.4h – Construction and justify the constructions of an equilateral triangle, a square, and a regular hexagon inscribed in a circle [Deleted] - G.10b [EKS] - Determine angle measures of a regular polygon in a tessellation [Deleted] - G.11b [EKS] - Find lengths of segments and non-central angle measures in a circle formed by intersecting chords, secants, and/or tangents [Deleted]	- G.RLT.1 - Included recognizing the relationship between a biconditional statement and a true conditional statement with a true converse; added Venn diagrams to represent set relationships and interpret Venn diagrams, including those representing situations in context - G.RLT.3 – Locate, count, and draw lines of symmetry given a figure, including figures in context - G.TR.1 – Solve for interior and exterior angles of a triangle, when given two angles - G.TR.2 – Given a triangle, use constructions to create a congruent triangle - G.TR.3 – Describe a sequence of transformations that can be used to verify similarity of triangles located in the same plane; solve problems involving attributes of similar figures, including problems in context - G.TR.4 – Find and verify trigonometric ratios using right triangles - G.PC.1 - Use constructions to verify properties of quadrilaterals - G.PC.3 - Determine the proportional relationship between the arc length or area of a sector and other parts of a circle; apply arc length or sector area to solve for an unknown measurement - G.PC.4 – Derive the equation of a circle given the center and radius using the Pythagorean Theorem - G.DF.1 – Identify the shape of a two-dimensional cross section of a three-dimensional figure - G.DF.2 – Recognize when two- and three-dimensional figures are similar

KEY: RLT = Reasoning, Lines, and Transformations (2023); TR = Triangles (2023); PC = Polygons and Circles (2023); DF = Two-Dimensional and Three-Dimensional Figures (2023); EKS = Essential Knowledge and Skills (2016); KS = Knowledge and Skills (2023); US = Understanding the Standard