Advanced Geometry Learning Targets

Semester 1

Chapter 1 & 2 – Introducing and Reasoning in Geometry

1.1 Building Blocks of Geometry
a.   I can identify, draw, and label points, lines, rays, planes, collinear points, and coplanar points.
b.   I can mark congruent segments in diagrams.

Coordinate Geometry 1: Midpoint
a.   I can find the coordinates of the midpoint of a segment
b.   Given a midpoint of a segment, I can write and solve an equation.*(supplement solving - not in the book)

1.2 Finding Angles
a.   I can name angles.
b.   I can find the measure of an angle using a protractor.
c.   Given an angle bisector, I can identify a pair of congruent angles.
d.   Given an angle bisector, I can write and solve an equation. *(supplement solving - not in the book)
e.   I can apply the angle addition property.

1.3 Creating Definitions
a.   I can define special types of angles such as right, acute, obtuse, complementary, supplementary, vertical, and linear pairs

2.5 Angle Relationships
a.   I can identify all of the following angles: vertical angles, linear pair, complementary angles, & supplementary angles.
b.   Given the special relationships of angles, I can write and solve equations.

2.6 Special Angles on Parallel Lines
a.   I can define & identify transversals, corresponding angles, alternate interior angles, & alternate exterior angles.
b.   I can identify, write, & solve equations given the relationships of angles formed by a transversal cutting parallel lines.

13.1 The Premises of Geometry (Supplementary materials needed)
a.   I can use the properties of arithmetic and equality to justify the steps in an algebraic proof.

13.2 Planning a Geometry Proof (Supplementary materials needed)
a.   I can use the parallel line postulates to plan and write a flowchart proof.

Chapter 4 - Discovering and Proving Triangle Properties

1.4 Polygons
a.   I can identify and define the properties of a polygon (closed figure, line segments, no curves).
b.   I can identify special characteristics of a polygon (concave, convex, equilateral, equiangular, and regular).
c.   I can classify a polygon based on its sides.
d.   I can write a congruency statement for congruent polygons, and use it to identify corresponding sides and angles.

1.5 Triangles
a.   I can name and classify a triangle based on it angles and sides.

4.1 Triangle Sum Conjecture
a.   I can explain and apply the triangle sum conjecture.

4.2 Properties of Isosceles Triangles

a.   I can determine if a triangle is isosceles or equilateral.
   b. I can write and solve equations by applying the properties of isosceles/equilateral triangles.

4.3 Triangle Inequalities
a.   I can use the triangle inequality conjecture to determine if a triangle exists.
b.   I can use the exterior angle conjecture to find unknown angle measures of a triangle.
c.   I can arrange sides of a triangle from least to greatest given its angle measures and vice versa.

4.4 Are There Congruence Shortcuts? (SSS, SAS, HL)
a.   I can write congruency statements.
b.   I can use SSS, SAS, HL to determine if two triangles are congruent.

4.5 Are There Other Congruence Shortcuts? (ASA, AAA, SAA)
a.   I can use ASA and SAA to determine if two triangles are congruent.

4.6 Corresponding Parts of Congruent Triangles (CPCTC)
a.   Given two congruent triangles, I can identify congruent corresponding parts.

4.7 Flowchart Proofs
a.   I can use triangle properties to plan and write flowchart proofs.

Chapter 5 - Discovering and Proving Polygon Properties

5.1 Polygon Sum Conjecture
a.   I can apply the polygon sum conjecture.
b.   I can find the measure an interior angle of a regular polygon.

5.2 Exterior Angles of a Polygon
a.   I can apply the exterior angle sum conjecture.
b.   I can find the measure of an exterior angle of a regular polygon.

1.6 Special Quadrilaterals
c.   I can classify special quadrilaterals such as a trapezoid, kite, parallelogram, rhombus, rectangle, and square.
d.   I can identify a special quadrilaterals from a diagram.
e.   I can sketch, mark, and label quadrilaterals given its characteristics.

5.3 Kite and Trapezoid Properties
a.   I can identify the properties of a kite and a trapezoid
b.   Given a kite or a trapezoid, I can write and solve equation based on their properties.

5.4 Properties of Parallelograms
a.   I can identify the properties of a parallelogram.
b.   Given a parallelogram, I can write and solve equation based on their properties.

5.5 Properties of Special Parallelograms
a.   I can identify the properties of a special parallelogram: rectangle, rhombus, and square.
b.   Given a rectangle, rhombus, or square, I can write and solve equations based on their properties.

5.7 Properties of Midsegments
a.   I can define a midsegment.
b.   Given a midsegment, I can write and solve equations.

Chapter 6 - Applications of Transformations
6.1 Symmetry and Transformations
a.   I can use rigid transformations to describe symmetry (reflectional, rotational and translational).
b.   I can identify the line of symmetry and point of symmetry.

1.9 Transformations
a.   I can identify a translation, rotation, and reflection.
b.   I can apply a translation, rotation, and reflection to a figure on a graph.

Coordinate Geometry 2: Transformations
a.   I can apply ordered pair rules to basic translations, rotations and reflections.

Coordinate Geometry 7: Dilations
a.   I can sketch a dilation.
b.   I can apply ordered pair rules to dilations.

Coordinate Geometry 3: Composition of Transformations
a.   I can combine two transformation rules to get a single transformation that takes the original figure directly to the second figure.
b.   I can determine a transformation rule to transform a second image back to the original.

Semester 2

Chapter 7- Establishing Similarity
7.1 Similar Polygons
a.   I can define similar polygons.
b.   I can write similarity statements.
c.   I can determine the scale factor of two similar polygons.
d.   Given similar polygons, I can use proportions to write and solve equations.

7.2 Similar Triangles
a.   I can determine if triangles are similar using AA, SSS, SAS.
b.   I can use proportions to verify if triangles are similar.

7.3 Indirect Measurement with Similar Triangles
a.   I can solve application problems using the properties of similar triangles.

7.5 Proportional Segments Between Parallel Lines
a.   I can use the Parallel/Portionality Conjecture to identify proportional sides.
b.   I can use the Parallel/Portionality Conjecture to find a missing lengths of a triangle.

Chapter 10 - The Pythagorean Theorem
10.1 The Pythagorean Theorem and its Converse
a.   I can apply the Pythagorean Theorem to solve for missing values
b.   I can use the converse of the Pythagorean Theorem to classify a triangle as right, acute or obtuse. (Need to supplement acute and obtuse)

Coordinate Geometry 9: Distance Formula
a.   I can calculate the distance between two points using the distance formula or the Pythagorean Theorem.
b.   I can find the perimeter of a polygon on the coordinate plane.

10.2 The Special Right Triangles
a.   I can use the relationships among the side lengths of a 45-45-90 and 30-60-90 triangle to solve for unknown side lengths.

10.3 Applications of the Pythagorean Theorem
a.   I can solve application problems using the Pythagorean Theorem.

Chapter 12 – Trigonometry

12.1 Trigonometric Ratios
a.   Given a right triangle, I can define the sine, cosine, and tangent ratios from an unknown angle.
b.   I can use Trigonometric Ratios to solve for unknown sides and angles in a right triangle.

12.2 Problem Solving with Right Triangles
a.   I can solve application problems using trigonometry ratios.
b.   I can use angle of elevation and angle of depression to solve right triangle application problems.

12.3 The Law of Sines
a.   I can use the Law of Sines to find missing sides and angles of triangles.
b.   I can use the Law of Sines to find the area of a triangle.

12.5 Problem Solving with Trigonometry
a.   I can correctly choose between trig ratios and Law of Sines to solve application problems.

Chapter 9 - Discovering and Proving Circle Properties
1.7 Circles
a.   I can identify and name the parts of a circle (radius, diameter, chord, tangent, point of tangency, center, circumscribed polygon, inscribed polygon, arcs, central angle, and inscribed angles, etc.).
b.   I can define congruent and concentric circles.

9.1 Tangent Properties
a.   I can determine and apply the relationship between a radius and a tangent line at the point of tangency.
b.   I can determine and apply the relationship between two tangent segments with a common endpoint outside the circle.

10.4 Circles and the Pythagorean Theorem
I can apply the Pythagorean Theorem to problems involving circles.

9.2 Chord Properties
a.   I can determine and apply the relationship between congruent chords and their central angles and intercepted arcs.
b.   I can identify and apply the Perpendicular to a Chord Conjecture.
c.   I can identify and apply the Chord Distance to Center Conjecture.
d.   I can identify and apply the Perpendicular Bisector of a Chord Conjecture.

9.3 Arcs and Angles
a.   I can identify and apply the relationship between inscribed angles and intercepted arcs (including semicircles).
b.   I can identify and apply the relationship of angles in an inscribed quadrilateral.

9.5 The Circumference/Diameter Ratio
a.   I understand the relationship between the circumference and the radius of circle.
b.   I can apply the circumference formula to solve problems.

9.6 Arc Length
a.   I can calculate the measure of an arc in a circle.
b.   I can calculate the length of the arc in a circle.

Coordinate Geometry 10: Circles in Coord. Geo
a.   Given an equation of a circle, I can identify the radius and center point.
b.   Given information about the circle, I can write the equation of that circle.
c.   Given an equation or information about the circle, I can sketch a circle on a coordinate plane

Chapter 8 - Area

8.1 Areas of Triangles and Special Quadrilaterals
a.   I can apply the area formulas of a rectangle, parallelogram, triangle, trapezoid, and kite to solve problems.

8.2 Applications of Area
a.   I can solve area application problems.

8.3 Areas of Circles and Regular Polygons
a.   I can apply the area formulas of a circle and a regular polygon to solve problems.

8.4 Areas of Sectors
a.   I can apply the area of a sector formula to solve problems.

8.6 Area and Similarity
a.   I can apply the relationship between the areas of similar figures to solve problems.

Chapter 11 - The Geometry of Solids

1.8 Space Geometry (Include 11.1)
a.   I can identify parts of geometric solids.
a.   I can identify the types of geometric solids.

8.5 Surface Area
a.   I can apply the surface area formulas to solve problems involving prisms, cylinders, pyramids, and cones.

11.7 Surface Area of a Sphere
a.   I can apply the surface area formula of a sphere or a hemisphere to solve problems.

11.2 Volume of Prisms and Cylinders
a.   I can apply the volume formulas for prisms and cylinders to solve problems.

11.3 Volume of Pyramids and Cones
a.   I can apply the volume formulas for pyramids and cones to solve problems.

11.4 Applications of Volume
a.   I can solve application problems involving the volume of polyhedrons, cones, cylinders, spheres, and hemispheres.

11.6 Volume of a Sphere
a.   I can apply the volume formulas for spheres or hemispheres to solve problems.

11.8 Similarity and Volume
a.   I can apply the relationship between the volumes of similar figures to solve problems.