Geometry

Course Description: Geometry covers the relationships between points, lines and planes. Additional topics are the properties of perpendicular and parallel, angle relationships, congruent and special polygons. The Pythagorean Theorem and the geometry of circles are also explored.

Learning Targets

Domain: Geometry Basics
Priority Standard: Students will learn and understand the basic terms and properties of Geometry.
- Students will recognize and identify basic geometry shapes and labeling them correctly.
- Students will measure and construct segments, lines, rays, and angle.
- Students will understand and use formulas for midpoint, distance, perimeter and area.
- Students will describe different pairs of angles

Domain: Reasoning and Proofs
Priority Standard: Students will be able to understand and use reasoning and proofs.
- Students will understand and use conditional statements.
- Students will know the difference between inductive and deductive reasoning and how to use them.
- Students will learn and understand how the rules of geometry and diagrams are used in a proof.
- Students will use proofs by algebraic reasoning and proving statements about segments, angles, and geometric relationships.

Domain: Parallel and Perpendicular Lines
Priority Standard: Students will learn the properties of parallel and perpendicular lines and how they relate to angles that are formed.
- Students will identify parallel and perpendicular lines and the angles they form.
- Students will use properties and theorems of parallel lines to understand the types of angles that are formed to calculate the different angle relationships.
- Students will use the distance and slope formulas to identify parallel and

perpendicular line.
- Students will use the equations of parallel and perpendicular lines to identify and construct other lines on a coordinate plane.

Domain: Transformations
Priority Standard: Students will learn the properties of rigid and nonrigid movements of transformations in a coordinate plane.
- Students will understand and use the properties of rigid movement to perform translations, reflections, and rotations with the properties of congruence.
- Students will understand and use the properties of nonrigid movement of dilations and how it relates to similarity

Domain: Congruent Triangles
Priority Standard: Students will learn the properties of triangles and polygons to calculate angles and prove congruence.
- Students will calculate the interior and exterior angles of triangles and polygons.
- Students will prove triangle congruence by SSS, SAS, ASA, AAS, and HL and use these triangles to prove other triangles
- Students will learn the properties of Isosceles and Equilateral triangles and use them to identify side lengths and angle measures.
- Students will understand how to prove congruence using the coordinate plane.

Domain: Relationships Within Triangles
Priority Standard: Students will explore the special segments of a triangle as well as inequalities within one and two triangles.
- Students will understand and use perpendicular bisectors, angle bisectors, medians, altitudes, and midsegments.
- Students will use indirect proof and inequalities in one and two triangles.

Domain: Quadrilaterals and Other Polygons
Priority Standard: Students will study the properties of various quadrilaterals and how they relate to each other and their differences.
- Students will understand and find the interior and exterior angles of any polygon as well as understand what it means to be regular.
- Students will understand and use the properties of parallelogram, including rectangles, rhombuses, and squares.
- Students will understand and use the properties of trapezoids and kites.

Domain: Similarity
Priority Standard: Students will study the properties of similarity in triangles and other polygons.
- Students will understand and use the properties of similar polygons.
- Students will prove similar triangles using AA, SSS, and SAS.

- Students will use the Triangle Proportionality Theorem to calculate various angles and side lengths.

Domain: Right Triangles and Trigonometry
Priority Standard: Students will use various properties and formulas to calculate the angles and sides of right and non-right triangles
- Students will understand and use the Pythagorean Theorem for finding the sides and proving that the figure is a right triangle.
- Students will use the formulas for 45-45-90 and 30-60-90 triangles to calculate the missing sides.
- Students will use the geometric mean to calculate the missing sides of similar triangles.
- Students will use trigonometry to calculate missing sides and angles of a right triangle.(sin, cos, and tan)
- Students will use the Law of Sines and Cosines to calculate the sides and angles of non-right triangles

Domain: Circles
Priority Standard: Students will study the properties of circles and the lines or segments within.
- Students will learn and use the properties of segments and lines of a circle including radii, diameters, chords, secants, and tangents of the circle as well as finding lengths..
- Students will find the measure and length of arcs.
- Students will find the measure of central, inscribed, and exterior angles of the circle
- Students will write the equation of a circle and graphing it in a coordinate plane.

Domain: Circumference, Area, and Volume
Priority Standard: Students will find the lengths, area, and volume of different 2D and 3D figures.
- Students will find the circumference, arc lengths, and areas of circles sectors of a circle.
- Students will find the area of polygons.
- Students will find the area and volume of prisms, pyramids, cylinders, cones, and spheres.

Learning targets will be assessed throughout the year with chapter assessments.

Any questions regarding these learning targets will be referred to High School Principal