MA.AG:1 **Students will demonstrate an understanding of the concepts of points, lines, and planes and their relationship to definitions and vocabulary. (G.CO.1)**

    MA.AG:1-1   Define basic geometry terms (e.g. intersect, bisect, collinear, theorem, complementary, angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc)

    MA.AG:1-2   Identify geometric terms and concepts from a diagram (e.g. intersects, collinear, linear pairs)

    MA.AG:1-3   Identify algebraic and geometric properties and use them to justify statements. (i.e. reflexive, symmetric, transitive)

MA.AG:2 **Students will demonstrate understanding of congruence in terms of rigid motions. (GCO6, GCO7, GCO8)**

    MA.AG:2-1   Determine if triangles are congruent using SSS, SAS, ASA, AAS, HL.

    MA.AG:2-2   Use corresponding parts of congruent triangles (CPCTC) to determine if segments and angles are congruent.

MA.AG:3 **Students will prove geometric theorems. (CGO9, GCO10, GCO11)**

    MA.AG:3-1   Make conclusions using conditional, converse, inverse and contrapositive statements and given information.

    MA.AG:3-2   Prove theorems about lines and angles whereas theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angle are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

    MA.AG:3-3   Prove theorems about triangles whereas theorems include: 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 properties of medians, altitudes, angle bisectors, and perpendicular bisectors.

    MA.AG:3-4   Prove theorems about parallelograms whereas theorems include; opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

MA.AG:4 **Students will demonstrate understanding of similarity. (GSRT2, GSRT3, GSRT4, GSRT5)**

MA.AG:4-1   Use proportions to solve problems. (e.g. find the measures of angles, lengths of figures, scale models)

MA.AG:4-2   Determine if triangles are similar using AA, SSS, or SAS similarity.

MA.AG:4-3   Use the properties of similar triangles to find lengths of segments and measure angles.

MA.AG:4-4   Solve problems involving similar triangles formed by the altitude drawn to the hypotenuse of a right triangle.

MA.AG:4-5   Calculate the area or volume of similar figures given the scale factor and an area or volume of a figure.

MA.AG:5 **Students will calculate unknown measurements of figures using geometric properties.**

MA.AG:5-1   Find missing measurements using geometric postulates or theorems (e.g. segment addition postulate, angle addition postulate).

MA.AG:5-2   Identify and use the properties of triangles to find measures of angles and lengths of segments (e.g. isosceles triangles, medians, altitudes, angle bisectors, perpendicular, bisectors).

MA.AG:5-3   Identify and use the properties of special quadrilaterals to find measures of angles and lengths of segments.

MA.AG:5-4   Find measures of angles formed by a transversal intersecting parallel lines.

MA.AG:5-5   Use properties of polygons to find measures of interior or exterior angles given the number of sides and vice-versa.

MA.AG:5-6   Use angle measures of a triangle to determine which side of the triangle is shortest or longest.

MA.AG:6 **Students will apply trigonometry to general triangles and solve problems involving right triangles. (GSRT6, GSRT7, GSRT8)**

MA.AG:6-1   Find the lengths of sides of 30-60-90 and 45-45-90 triangles.

MA.AG:6-2   Use trigonometric ratios to solve triangles including real world situations with angle of elevation and depression.

MA.AG:6-3   Classify a triangle as acute, obtuse, or right using the Converse of the Pythagorean Theorem.

MA.AG:7 **Students will demonstrate understanding and apply theorems about circles. (GC2, GC4, GC5, GPE1)**

MA.AG:7-1   Identify relationships among inscribed angles, radii, chords, secants, and tangents and find missing measurements.
MA.AG:7-2   Find arc lengths, lengths of segments in circles, and areas of sectors of circles.
MA.AG:7-3   Identify the coordinates of the center of a circle given the equation of the circle and write the equation of a circle given the center and radius.

MA.AG:8 **Students will use coordinates to prove simple geometric theorems algebraically. (GPE4, GPE6, GPE7)**

MA.AG:8-1   Use the distance formula to calculate the distance between two given points.
MA.AG:8-2   Calculate the midpoint between two given points.
MA.AG:8-3   Use coordinates to compute perimeters of polygons, areas of triangles and quadrilaterals, and classify a triangle when given the coordinates of the vertices.

MA.AG:9 **Students will use area and volume formulas to solve problems. (GMD1, GMD3)**

MA.AG:9-1   Find the area of regular polygons.
MA.AG:9-2   Use volume and surface area formulas for cylinders, pyramids, cones, and spheres to solve problems given a real world context.

MA.AG:10 **Students will be able to make geometric constructions using a compass and straightedge. (GCOD 12)**

MA.AG:10-1 Construct midpoint, segment bisector, and angle bisector.
MA.AG:10-2 Construct parallel and perpendicular lines; including the perpendicular bisector of a line segment and constructing a line parallel to a given line through a point not on the line.

MA.AG:11 **Students will be able to draw a geometric figure given a rotation, reflection, or translation on graph paper. (GCOD 4, GCOD 5)**

MA.AG:11-1 Graph a rotation of 90, 180, 270, or 360 degrees of a geometric figure.
MA.AG:11-2 Graph a reflection across the x or y axis of a geometric figure.
MA.AG:11-3 Graph a translation or dilation of a geometric figure.