GEOMETRY
CONTENT STANDARDS

.

1.0 Students show understanding of new/unfamiliar vocabulary by giving real world application. Students differentiate between axioms (rules accepted without proof) and theorems (rules that can be proven). Students make conclusions by using inductive reasoning (by studying patterns) and deductive reasoning (with "if/then" statements and laws of logic.)

2.0 Students write geometric proofs, including proofs by contradiction.

3.0 Students show that a statement is true for all cases by using logical steps and constructions. Students show a statement is false by giving a counter example.

4.0 Students confirm basic theorems using similarity and congruence in polygons.

5.0 Students prove that triangles are congruent (same shape, same size) or similar and apply the concept of corresponding parts of congruent triangles are congruent (CPCTC).

6.0 Students know and are able to use the triangle inequality theorem.

7.0 Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.

8.0 Students derive formulas and calculate circumference of a circle, the perimeter of 2- dimensional figures, area of all surfaces in 2-dimensional, and 3-dimensional figures, and the volume of 3-dimensional figures.

9.0 Students calculate the volume and surface area of prisms, pyramids, cylinders, cones, and spheres. Students must memorize the volume and surface area formulas for prisms, pyramids, and cylinders.

10.0 Students calculate the areas of 2-dimensional figures (polygons) such as rectangles, triangles, rhombi, parallelograms, and trapezoids.

11.0 Students understand how changes in length, width, and height of common geometric figures, and solids, affect perimeter, area and volume.

12.0   Students recognize, define, and solve problems involving polygons if given measures of sides, interior angles, and/or exterior angles.

13.0   Students will identify, understand and justify angle relationships formed by lines including vertical, supplementary, complementary and exterior angles. These relationships will be applied to interior/exterior angles of polygons.

14.0   Students prove the Pythagorean theorem.

15.0   Students use the Pythagorean theorem to calculate distance and lengths of missing sides of right triangles.

16.0   Students use a compass and straightedge to construct angle bisectors, perpendicular bisectors and the line parallel to a given line through a point not on the line.

17.0   Students prove basic theorems using the slopes and midpoints of lines in the coordinate plane, the distance formula, and equations of lines and circles.

18.0   Students recognize the basic trigonometric functions (sine, cosine, tangent) in relation to right triangles. They also know and can use basic relationships between them. For example, $\tan(x) = \sin(x) / \cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$

19.0   Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.

20.0   Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles, and 45°, 45°, and 90° triangles.

21.0   Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.

22.0   Understand and recognize the effects of a rotation, translation or reflection on a figure. Students label coordinates and create a visual representation of the newly placed figure.