8th Grade Common Core Mathematics Standards – Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software.

- G.1
    - Verify experimentally the properties of rotations, reflections, and translations:
        - a. Lines are taken to lines, and line segments to line segments of the same length.
        - b. Angles are taken to angles of the same measure.
        - c. Parallel lines are taken to parallel lines.
- G.2
    - Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
- G.3
    - Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- G.4
    - Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
- G.5
    - Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

Understand and apply the Pythagorean Theorem.

- G.6
    - Explain a proof of the Pythagorean Theorem and its converse.
- G.7
    - Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- G.8
    - Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

<u>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</u>

- G.9
    - Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.