

**SAU 50
Grade 8
Mathematics
Geometry**

Geometry: [congruence](#) and [similarity](#); [Pythagorean Theorem](#); and [volume](#) of cylinders cones, and spheres.

SAU 50 District Competency:

Students will independently use their learning to design and create a visual representation using spatial relationships and measurement.

Essential Questions

- Why are formulas important?
- Are geometric properties invented or discovered? Are they in our heads or really “out there”?
- How can we prove that a claim is true?
- How can you use different measurements to solve real-life problems?

Acquisition

Students will demonstrate the following to meet the standards.

- I can describe a sequence of transformations that exhibits the congruence between two congruent figures.
- I can perform multiple transformations on a geometric figure (reflections, rotations, translations and/or dilations).
- I can apply the Pythagorean Theorem to determine unknown side lengths in the right triangles in real-world and mathematical problems in two and three dimensions.
- I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
- I can apply the formulas for the volumes of cones, cylinders and spheres to solve real-world and mathematical problems.
- I can setup and solve multi-step equations relating to angle relationships.

Standards

NH College and Career Ready Standards

Key to Standard Notation:

8.G.1: 8 (grade level) G (domain: Geometry) 1 (number of the standard)

Geometry

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

8.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.

8.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.

8.G.3: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.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.

8.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.

Understand and apply the Pythagorean Theorem.

8.G.6: Explain a proof of the Pythagorean Theorem and its converse.

8.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.

8.G.8: Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

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

[New Hampshire College and Career Ready Standards](#)

References:

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core Standards for Mathematics* (United States, National Governors Association Center for Best Practices, Council of Chief State School Officers). Retrieved August 10, 2016, from

http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

Math is fun/definitions. (n.d.). Retrieved April 17, 2017, from <http://www.mathisfun.com/definitions>