8th Grade Unit 6: Exploring Geometric Relationships

Overview:

In this sixth unit of eighth-grade math, students will solve contextual, geometric problems involving the Pythagorean Theorem and the volume of geometric figures to explain real phenomena. Students will extend their work with numerical reasoning (rational and irrational numbers) and apply geometric and spatial reasoning to interpret and solve problems involving the Pythagorean Theorem. Students will work with right triangles and investigate proofs of the Pythagorean Theorem and its converse. They will also extend their knowledge of volume from previous grades to explain real phenomena involving cones, cylinders, and spheres.

Learning Targets:

In Unit 6, students will:

- Explain a proof of the Pythagorean Theorem and its converse using visual models.
- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles within authentic mathematical problems in two and three dimensions.
- Apply the Pythagorean Theorem to find the distance between two points in a coordinate system in practical mathematical problems.
- Apply the formulas for the volume of cones, cylinders, and spheres and use them to solve relevant, real-life problems.

Key Vocabulary: (linked to GA DOE Interactive Glossary)

Altitude of a Triangle	Base (of a polygon)	Coordinate Plane	Cone
Converse of the Pythagorean Theorem	Cube Root	Cylinder	Deductive Reasoning
Geometric Reasoning	Geometric Solid	Height of Solids	Hypotenuse
Irrational Number	Leg of a Triangle	Literal Equation	Perfect Cube
Perfect Square	Pi (π)	Pythagorean Theorem	Pythagorean Triples
Radical	Radius	Rational Number	Right Circular Cone
Right Cylinder	Right Triangle	Slant Height	Spatial Reasoning
Sphere	Square Root	Three-dimensional Figure	Two-dimensional Figure
Volume			

Supporting Resources:

- http://ctlslearn.cobbk12.org/
- https://gavirtual.instructure.com/courses/34331
- Pi
- Cube Roots
- Coordinate Plane
- Volume of a Sphere
- Irrational Numbers
- Pythagorean Theorem
- Square Roots
- Volume
- Volume of Cylinders
- Rational Numbers
- Volume of a Cone