Module 1: Composing and Decomposing

TOPIC 3: SHAPES AND SOLIDS

In this topic, students determine if three given line segments will construct a triangle or not. They use hands-on tools to make and justify conjectures about the sum of the interior angles of a triangle and the relationship between triangle side and angle measures. From their knowledge of rectangles and area, students also develop the formula for the area of parallelograms, triangles, and trapezoids. Students build on their prior knowledge of volume of cubes and rectangular prisms with whole length dimensions to calculating volume of right rectangular prisms with positive rational number dimensions.

Where have we been?

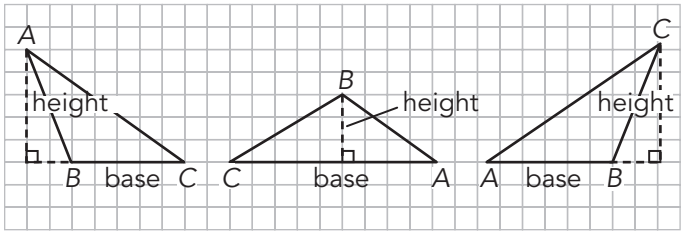
Students begin this topic by building off their previous knowledge of triangles to discover the Triangle Sum Theorem. In previous years, students have learned about area of squares and rectangles. Now, they will decompose rectangles to derive area formulas for parallelograms, triangles, and trapezoids. In grade 5, students learned how to calculate the volume of a right rectangular prism by filling it with cubes and eventually by using the formulas $V = lwh$ and $V = Bh$. Now, students extend that previous understanding to calculating the volume of right rectangular prisms with positive rational number dimensions.

Where are we going?

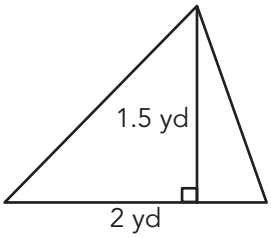
This topic provides the building blocks for the remaining geometry topics in middle school, as well as those in high school. In grades 7 and 8, students will continue to build upon angle relationships as well as area of figures when they decompose composite figures to calculate total area. Students continue building their knowledge of area and volume when they calculate surface area and volume of prisms, pyramids, cylinders, cones, and spheres.

Using Formulas to Calculate Area

The height of a triangle is the length of a line segment drawn from a vertex of the triangle to the opposite side so that it forms a right angle with the opposite side.

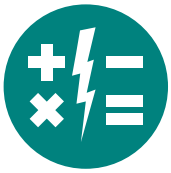


For example, in this triangle, the base, b, is equal to 2 yards and the height, h, is equal to 1.5 yards.



$$\text{Area of a triangle} = \frac{1}{2}bh$$
$$= \frac{1}{2}(2)(1.5)$$
$$= 1.5 \text{ square yards}$$

Myth: Asking questions means you don't understand.



It is universally true that, for any given body of knowledge, there are levels to understanding. For example, you might understand the rules of baseball and follow a game without trouble. But there is probably more to the game that you can learn. For example, do you know the 23 ways to get on first base, including the one where the batter strikes out?

Questions don't always indicate a lack of understanding. Instead, they might allow you to learn even more about a subject that you already understand. Asking questions may also give you an opportunity to ensure that you understand a topic correctly. Finally, questions are extremely important to ask yourself. For example, ***everyone*** should be in the habit of asking themselves, "Does that make sense? How would I explain it to a friend?"

#mathmythbusted

Talking Points

You can further support your student's learning by asking questions about the work they do in class or at home. Your student is becoming fluent with fraction operations and gaining experience with the area of two-dimensional shapes and the volume of right rectangular prisms.

Questions to Ask

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? Why?
- Is there anything you don't understand? How can you use today's lesson to help?

Key Terms

Triangle Sum Theorem
The Triangle Sum Theorem states that the sum of the measures of the interior angles of a triangle is 180°.

variable
A variable is a letter used to represent a number.

volume
Volume is the amount of space occupied by an object and is measured in cubic units.

polyhedron
A polyhedron is a three-dimensional figure that has polygons as faces.