Lesson 2: Measuring 3-D Shapes

**DIRECTIONS:**

**Time Required:** 20 minutes, plus additional time for worksheets

Finally, draw a square pyramid on the board and mark the dimensions: height = 3 feet, length = 4 feet, and width = 5 feet.

**Conversions Rock Bars, Lines, & Pies (Graphing)**

Students may need a calculator to find the volume of the pyramid. Students may ask:

- What is a square pyramid?
- Why do we need to know the formula to calculate the volume of a square pyramid?
- What is the surface area of a square pyramid?

**Volume of a Square Pyramid**

- The formula for the volume of a square pyramid is $V = \frac{1}{3}Bh$, where $B$ is the base area and $h$ is the height.
- Ask students to calculate the volume of the square pyramid with the given dimensions. The answer is $\frac{1}{3} \times (4^2) \times 3 = 12$ cubic feet. Explain that this is the amount of space inside a 3D shape, measured in cubic units.

**Surface Area of a Square Pyramid**

- The formula for the surface area of a square pyramid is $SA = B + \frac{1}{2}Pl$, where $B$ is the base area, $P$ is the perimeter of the base, and $l$ is the slant height of the pyramid.
- Ask students to calculate the surface area of the square pyramid with the given dimensions. The answer is $4^2 + \frac{1}{2} \times 12 \times 5 = 22$ square feet. Explain that the surface area is the total area of all surfaces of a 3D shape, measured in square units.

**Extensions:**

- **Student Worksheet 2:** The students have now learned how to calculate the volume and surface area of different 3D shapes. They can now use these formulas to measure 3D objects. Practicing with different 3D objects will help them understand the concepts better.

**Note:** All program pages appear in full color, yet are designed to easily reproduce in black and white.