Volume of Prisms

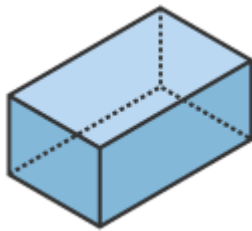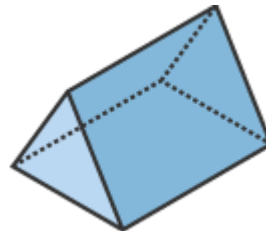## What is Volume?

Identify the Baes and Height

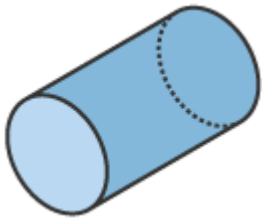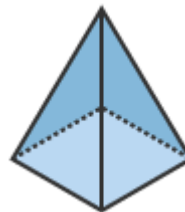| Cube | Rectangular Prism | Triangular Prism | Hexagonal Prism |

| Cylinder | Cone | Square Pyramid | Sphere |
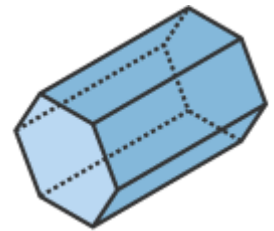
Prior Examples

1. Which packages below have a volume of 54 cubic feet?

3 ft
2 ft
9 ft

3 ft
3 ft
3 ft

$4\frac{1}{5}$ ft
2 ft
3 ft

9 ft
1 ft
6 ft
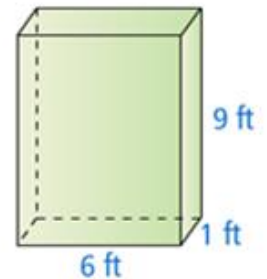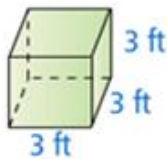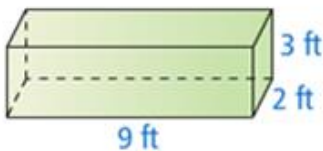
2.   What is the volume of a cube with edge length $\frac{3}{4}$ ft?

3.   What is the volume of the right triangular prism?
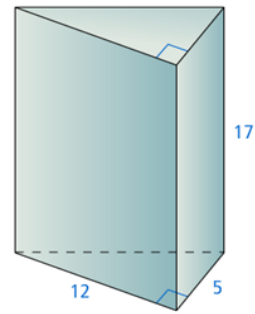
17

12   5

4.   A rectangular prism has a Volume of 4048 cubic centimeters. If the length is 16 cm and the height is 11 cm, what is the width of the prism?
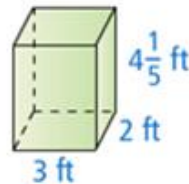
5.   A store clerk wants to stack shoe boxes on a shelf that is 3 ft. tall. A shoebox has a Volume of 528 cubic inches and the area of its base is 96 square inches. Find the height of each shoe box and determine how many shoe boxes the clerk can stack on the shelf.

Volume of Prisms

What is Volume?

Space Inside a 3D Shape

$$V = B \cdot h$$

↖ Area of Base

Identify the Bases and Height

Cube	Rectangular Prism	Triangular Prism (Bases↗)	Hexagonal Prism (Bases)

$V = L \times W \times H$ $V = L \times W \times H$ $V = \dfrac{b \cdot w}{2} \cdot H$

Cube: Base, H
Rectangular Prism: H, Base
Triangular Prism: Base, Base, Height
Hexagonal Prism: H, Base

Cylinder	Cone	Square Pyramid	Sphere

Cylinder: H, Base
Cone: H, π, Base
Square Pyramid: H, π, Base

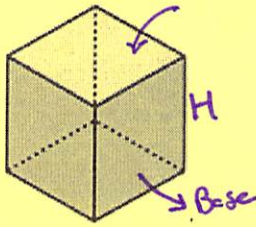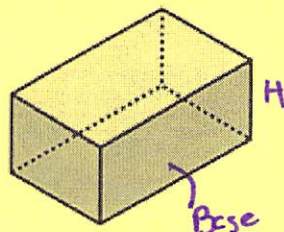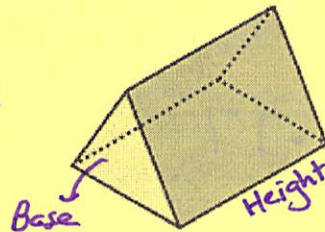## Prior Examples

1. Which packages below have a volume of 54 cubic feet?

$V = L \times W \times H$

3 ft, 2 ft, 9 ft

3 ft, 3 ft, 3 ft

$4\frac{1}{5}$ ft, 2 ft, 3 ft

9 ft, 1 ft, 6 ft
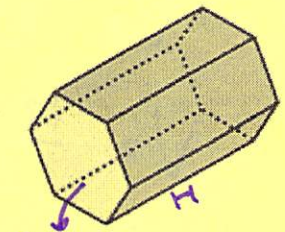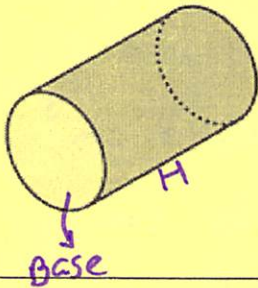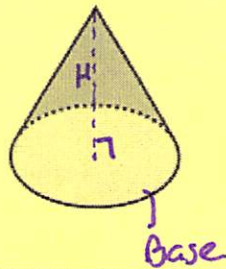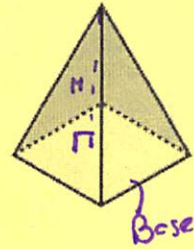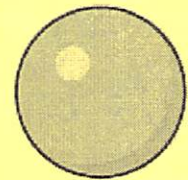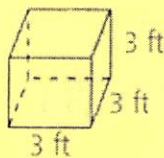
$V = 54 \text{ ft}^3$ $V = 27 \text{ ft}^3$ $V = \dfrac{3}{1} \cdot \dfrac{2}{1} \cdot \dfrac{21}{5}$ $V = 54 \text{ ft}^3$

$V = \dfrac{126}{5}$

$V = 25\frac{1}{5} \text{ ft}^3$

2. What is the volume of a cube with edge length $\frac{3}{4}$ ft?

F: $V = L \cdot W \cdot H$ $\qquad$ $V = s^3$

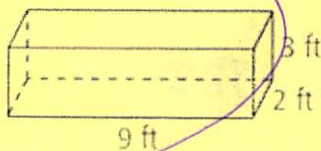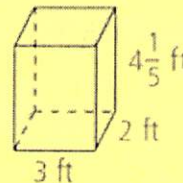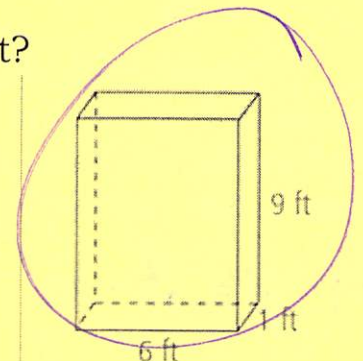S: $V = \frac{3}{4} \cdot \frac{3}{4} \cdot \frac{3}{4}$
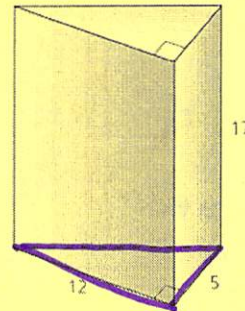
S: $\boxed{V = \frac{27}{64} \ ft^3}$

3. What is the volume of the right triangular prism?

F: $V = B_\triangle \cdot h$

S: $V = \frac{12 \cdot 5}{2} \cdot 17$

$V = 30 \cdot 17$

$\boxed{V = 510 \ units^3}$

17

12   5

4. A rectangular prism has a Volume of 4048 cubic centimeters. If the length is 16 cm and the height is 11 cm, what is the width of the prism?

F: $V = L \times W \times H$ $\qquad$ $V = 4048 \ cm^3$

S: $4048 = 16 \cdot W \cdot 11$ $\qquad$ $L = 16 \ cm$

S: $\frac{4048}{176} = \frac{176 \cdot W}{176}$ $\qquad$ $H = 11 \ cm$

$\boxed{W = 23 \ cm}$ $\qquad$ $W = \ ?$

5. A store clerk wants to stack shoe boxes on a shelf that is 3 ft. tall. A shoebox has a Volume of 528 cubic inches and the area of its base is 96 square inches. Find the height of each shoe box and determine how many shoe boxes the clerk can stack on the shelf.

F: $V = B \cdot h$ $\qquad$ $3ft = 36 \ in$ $\qquad$ $V = 528 \ in^3$

S: $\frac{528}{96} = \frac{96 \cdot h}{96}$ $\qquad$ $36 \div 5.5$ $\qquad$ $B = 96 \ in^2$

$\qquad\qquad\qquad\qquad\qquad$ 6.54 $\qquad$ $H = ?$

$\boxed{5.5 \ in = h}$ $\qquad$ $\boxed{6 \ boxes}$