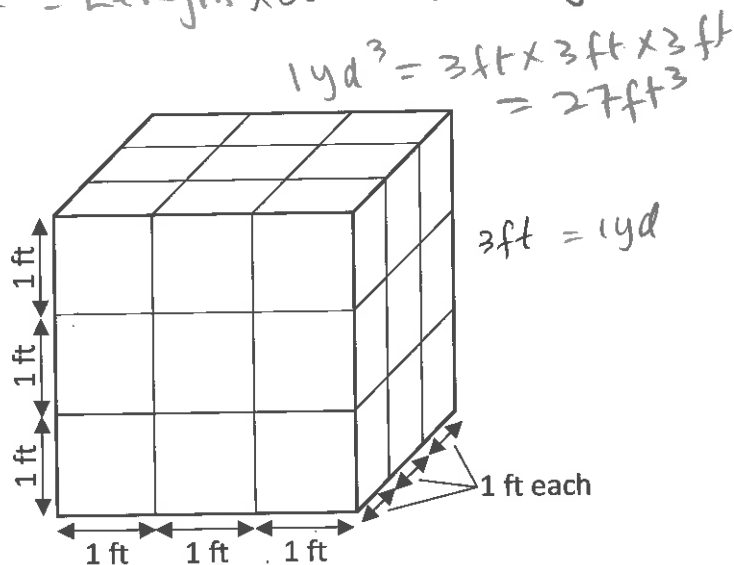
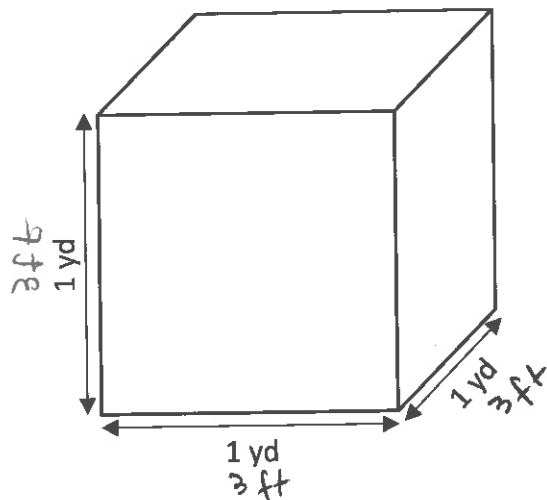


The **volume** of an object is measured in **cubic units**. In order to convert volumes, you need to **cube the conversion factor** before you start.

$$\text{Volume} = \text{Length} \times \text{width} \times \text{height}$$

To illustrate this point, let's look at one cubic yard:



We know that  $1 \text{ yd} = 3 \text{ ft}$ . When talking about **volume** however, we can see that if we **cube** both sides of the conversion factor, we arrive at the correct volume conversion factor of  $1 \text{ yd}^3 = 27 \text{ ft}^3$ .

**Example 3**

Perform the following conversions of volume measures:

a) Convert  $3.4 \text{ m}^3$  to  $\text{cm}^3$ .

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ m}^3 = 100 \text{ cm} \times 100 \text{ cm} \times 100 \text{ cm}$$

$$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$$

$$\frac{x \text{ cm}^3}{3.4 \text{ m}^3} = \frac{1,000,000 \text{ cm}^3}{1 \text{ m}^3}$$

$$x \text{ cm}^3 = \frac{1,000,000 \text{ cm}^3 \times 3.4 \text{ m}^3}{1 \text{ m}^3}$$

$$x = 3,400,000 \text{ cm}^3$$

b) Convert  $84 \text{ ft}^3$  to  $\text{yd}^3$ .

$$1 \text{ yd} = 3 \text{ ft}$$

$$1 \text{ yd}^3 = 27 \text{ ft}^3$$

$$\frac{x \text{ yd}^3}{84 \text{ ft}^3} = \frac{1 \text{ yd}^3}{27 \text{ ft}^3}$$

$$x = \frac{1 \text{ yd}^3 \times 84 \text{ ft}^3}{27 \text{ ft}^3}$$

$$x = 3.11 \text{ yd}^3$$

c) Convert  $298 \text{ in}^3$  to  $\text{ft}^3$ .

$$1 \text{ ft}^3 = 12 \times 12 \times 12$$

$$1 \text{ ft}^3 = 1728 \text{ in}^3$$

$$\frac{x \text{ ft}^3}{298 \text{ in}^3} = \frac{1 \text{ ft}^3}{1728 \text{ in}^3}$$

$$x = \frac{1 \text{ ft}^3 \times 298 \text{ in}^3}{1728 \text{ in}^3}$$

$$x = 0.17 \text{ ft}^3$$

d) Convert  $4.3 \text{ yd}^3$  to  $\text{in}^3$ .

$$1 \text{ yd} = 36 \text{ in}$$

$$1 \text{ yd}^3 = 36 \times 36 \times 36$$

$$1 \text{ yd}^3 = 46,656 \text{ in}^3$$

$$\frac{x \text{ in}^3}{4.3 \text{ yd}^3} = \frac{46,656 \text{ in}^3}{1 \text{ yd}^3}$$

$$x = \frac{46,656 \text{ in}^3 \times 4.3 \text{ yd}^3}{1 \text{ yd}^3}$$

$$x = 200,620.8 \text{ in}^3$$