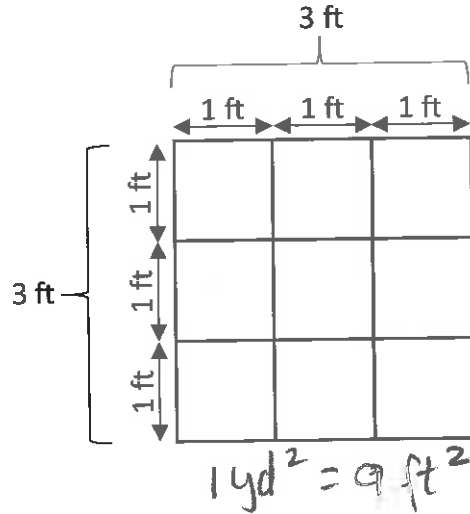
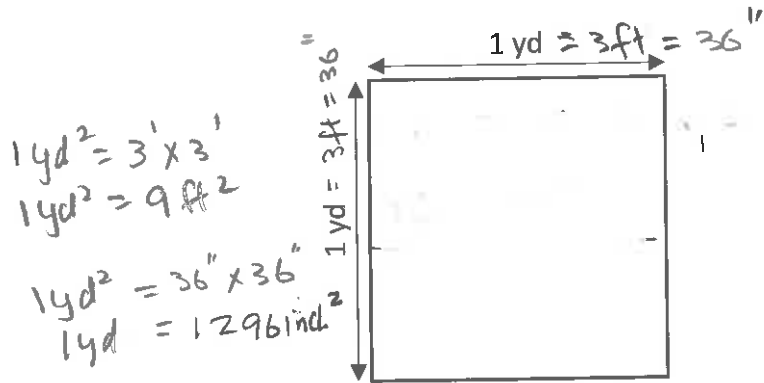


The **area** or **surface area** of an object is measured in **square units**. In order to convert areas, you need to also **square the conversion factor** before you start.

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

$Area = Length \times Width$



We know that  $1 \text{ yd} = 3 \text{ ft}$ . When talking about **area** however, we can see that if we **square** both sides of the conversion factor, we arrive at the correct area conversion factor of  $1 \text{ yd}^2 = 9 \text{ ft}^2$ .

**Example 2**

Perform the following conversions of area measures:

a) Convert  $2.6 \text{ m}^2$  to  $\text{cm}^2$ .

$1 \text{ m} = 100 \text{ cm}$   
 $1 \text{ m}^2 = 100 \text{ cm} \times 100 \text{ cm}$   
 $1 \text{ m}^2 = 10\,000 \text{ cm}^2$

So  $\frac{x \text{ cm}^2}{2.6 \text{ m}^2} = \frac{10\,000 \text{ cm}^2}{1 \text{ m}^2}$   
 $x \text{ cm}^2 = \frac{10\,000 \text{ cm}^2 \times 2.6 \text{ m}^2}{1 \text{ m}^2}$   
 $2.6 \text{ m}^2 = 26\,000 \text{ cm}^2$

c) Convert  $6.1 \text{ ft}^2$  to  $\text{in}^2$

$12 \text{ inches} = 1 \text{ ft}$   
 $144 \text{ in}^2 = 1 \text{ ft}^2$

$\frac{x \text{ in}^2}{6.1 \text{ ft}^2} = \frac{144 \text{ in}^2}{1 \text{ ft}^2}$   
 $x = \frac{144 \text{ in}^2 \times 6.1 \text{ ft}^2}{1 \text{ ft}^2}$   
 $x = 878.4 \text{ in}^2$

b) Convert  $173 \text{ ft}^2$  to  $\text{yd}^2$ .

$1 \text{ yd}^2 = 9 \text{ ft}^2$

$\frac{x \text{ yd}^2}{173 \text{ ft}^2} = \frac{1 \text{ yd}^2}{9 \text{ ft}^2}$   
 $x = \frac{1 \text{ yd}^2 \times 173 \text{ ft}^2}{9 \text{ ft}^2}$   
 $x = 19.22 \text{ yd}^2$

d) Convert  $180\,950 \text{ ft}^2$  to  $\text{mi}^2$

$1 \text{ mile} = 5280 \text{ ft}$   
 $1 \text{ mi}^2 = 5280 \text{ ft} \times 5280 \text{ ft}$   
 $1 \text{ mi}^2 = 27\,878\,400 \text{ ft}^2$

$\frac{x \text{ mi}^2}{180\,950 \text{ ft}^2} = \frac{1 \text{ mi}^2}{27\,878\,400 \text{ ft}^2}$   
 $x = \frac{1 \text{ mi}^2 \times 180\,950 \text{ ft}^2}{27\,878\,400 \text{ ft}^2}$   
 $x = 0.0065 \text{ miles}^2$   
 $x = 0.01 \text{ mi}^2$