

## 4.1 Unit Conversion Worksheet

Name \_\_\_\_\_

When converting from one a unit to another it is useful to use conversion factors. Conversion factors are fractions that equal 1 because the numerator (top) equals the denominator (bottom), but they use different units. In algebra you learned that multiplying any quantity by 1 does not change the quantity's value, so we can use conversion factors to change the units of a measurement without changing the value of a measurement.

For instance, since 1 km = 1000 m, 1 min = 60 s, and 1 hr = 60 min, we can create the conversion factors below:

$$\frac{1 \text{ km}}{1000 \text{ m}} = 1 \quad \frac{1 \text{ min}}{60 \text{ s}} = 1 \quad \frac{1 \text{ hr}}{60 \text{ min}} = 1 \quad \text{and} \quad \frac{1000 \text{ m}}{1 \text{ km}} = 1 \quad \frac{60 \text{ s}}{1 \text{ min}} = 1 \quad \frac{60 \text{ min}}{1 \text{ hr}} = 1$$

By using all 3 of these conversion factors you can convert 15 km/hr into m/s. Be careful to use the conversion factor that cancels the units you are trying to convert out of. If you can cancel (reduce to 1) those units you did it correctly.

$$\frac{15 \text{ km}}{1 \text{ hr}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ s}} = 4.2 \text{ m/s}$$

Carry out the following conversions. If you have trouble, start by writing out the conversion factors you'll need.

### Conversions

1 hour = 3600 seconds  
1 meter = 3.28 feet  
1 kg = 2.2 lbs  
1km = 1000m  
100cm = 1 m

1 mile = 5280 feet  
1 km = 0.62 miles  
1 lb = 0.45 kg  
1 foot = 12 inches

1 yard = 3 feet  
1 light second = 300,000,000 meters  
1 quart = 0.946 liters  
1 inch = 2.54 cm = 25.4 mm

### Convert the following quantities.

1) 565,900 seconds into days

2) 17 years into minutes

3) 43 miles into feet

4) 165 pounds into kilograms

5) 100 yards into meters

6) 22,647 inches into miles

7) 2678 cm into feet

- 8) 60 miles per hour into meters per second
  
- 9) 130 meters per second into miles per hour
  
- 10) 1100 feet per second into miles per hour
  
- 11) 53 yards per hour into inches per week
  
- 12) 721 lbs per week into kg per second
  
- 13) 88 inches per second into miles per day
  
- 14) 12080 gallons per month into liters per hour
  
- 15) 27 miles per gallon into kilometers per liter
  
- 16) 186,282 miles per second into meters per second