

Unit Conversions

Use **unit analysis** to solve the following problems. Conversion factors can be found on your conversion factors handout. **YOU MUST SHOW YOUR WORK!**

Conversions of Distance

1- Write down your height (in feet and inches): 5 ft 7 in

a. Determine your height in inches.

$$\left(\frac{5 \text{ ft} \times 12 \text{ in}}{1 \text{ ft}} \right) + 7 \text{ in} = 67 \text{ in}$$

b. Determine your height in yards.

$$\frac{67 \text{ in}}{36 \text{ in}} = 1.86 \text{ yd}$$

c. Determine your height in miles (Write your answer in scientific notation).

$$\frac{1.86 \text{ yd}}{1 \text{ yd}} \times \frac{3 \text{ ft}}{1 \text{ yd}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} = \frac{5.58 \text{ mi}}{5280} = .00106 \text{ mi}$$

↓
 1.06×10^{-3}

d. Determine your height in cm (write your answer in scientific notation)

$$\frac{67 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 170.18 = 1.702 \times 10^2$$

2- The largest human cell is the female egg cell, with a diameter of 121 micrometers (μm). What is the diameter of a human egg cell in millimeters?

$$\frac{121 \mu\text{m}}{1000 \mu\text{m}} = .121 \text{ mm}$$

3- The tallest building in the world, the Burj Khalifa in Dubai, is 0.828 kilometers high. What is the building's height in centimeters?

$$\frac{.828 \text{ km}}{1 \text{ km}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{100 \text{ cm}}{1 \text{ m}} = 82,800 \text{ cm}$$

4- What is the Burj Khalifa's height in feet?

$$\frac{.828 \text{ km}}{1 \text{ km}} \times \frac{.621 \text{ mi}}{1 \text{ km}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} = 2714.91 \text{ feet}$$

5- Mount Everest is 29,029 feet high. What is the height of Mount Everest in Kilometers?

$$\frac{29029 \text{ ft}}{5280 \text{ ft}} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}} = 8.85 \text{ km}$$

6- A marathon is 26.2 miles long. A average marathon runners gate is around a meter long. How many meters will the average participant run?

$$\frac{26.2 \text{ mi}}{1 \text{ mi}} \cdot \frac{1.61 \text{ km}}{1 \text{ mi}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} = 42,182 \text{ m}$$

Conversions of Time

7- Jim went for a 3.75 hour run (moron), how many minutes was Jim running?

$$\frac{3.75 \text{ hr}}{1 \text{ hr}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 225 \text{ min}$$

8- Earth takes 1 year to orbit the sun. How many hours does it take for this to occur?

$$\frac{1 \text{ yr}}{1 \text{ yr}} \cdot \frac{365 \text{ day}}{1 \text{ yr}} \cdot \frac{24 \text{ h}}{1 \text{ day}} = 8760 \text{ hours}$$

9- June has 30 days. How many minutes are in June?

$$\frac{30 \text{ days}}{1 \text{ day}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 43,200 \text{ min}$$

Conversions of Volume

10-A beaker holds 0.00015 kiloliters of water. How many milliliters of water does it hold?

$$\frac{.00015 \text{ kL}}{1 \text{ kL}} \cdot \frac{1000 \text{ L}}{1 \text{ kL}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} = 150 \text{ mL}$$

11-A man breathes in 3.3 liters of air with a normal breath. What is the volume of air in cubic centimeters?

$$\frac{3.3 \text{ L}}{1 \text{ L}} \cdot \frac{1000 \text{ mL}}{1 \text{ L}} \cdot \frac{1 \text{ cm}^3}{1 \text{ mL}} = 3300 \text{ cm}^3$$

12-A swimming pool has a volume of 166.9 cubic meters (m³). How many gallons of water can the pool hold?

$$\frac{166.9 \text{ m}^3}{1 \text{ m}^3} \cdot \frac{1.0 \cdot 10^6 \text{ cm}^3}{1 \text{ m}^3} \cdot \frac{1 \text{ mL}}{1 \text{ cm}^3} \cdot \frac{1 \text{ L}}{1000 \text{ mL}} \cdot \frac{1 \text{ gal}}{3.785 \text{ L}} = 44,095 \text{ gal}$$