

Get out 2.2 Notes and Grab a Calculator

Solve the following on your boards:

How many pints are in 28 quarts if 2 pints = 1 quart?

$$\frac{28 \cancel{\text{qt}}}{1} \cdot \frac{2 \text{ pts}}{1 \cancel{\text{qt}}} = 56 \text{ pints}$$

## Day 7 - Multi-Step Dimensional Analysis & Applications

How many seconds are in a day?

Most of us do not know how many seconds are in a day or hours in a year. However, most of us know that there are 60 seconds in a minute, 60 minutes in an hour, and 24 hours in a day. Some problems with converting units require multiple steps. When solving a problem that requires multiple conversions, it is helpful to create a flowchart of conversions you already know, set up your conversion factors, and solve your problem.

Flowchart: Days → Hours → Minutes → Seconds

Conversion Factors: 60 sec = 1 min, 60 min = 1 hr, 24 hours = 1 day

$$\begin{aligned}
 & \frac{1 \text{ day}}{1} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} = \frac{1 \cdot 24 \cdot 60 \cdot 60 \text{ Sec}}{1 \cdot 1 \cdot 1 \cdot 1} \\
 & = \boxed{86400 \text{ sec}}
 \end{aligned}$$

Scenario 1: How many inches are in 3 miles? (5280 feet = 1 mile, 12 inches = 1 foot) miles → ft → inch

$$\begin{aligned}
 & \frac{3 \text{ mi}}{1} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = \frac{3 \cdot 5280 \cdot 12 \text{ in}}{1} \\
 & = 190,080 \text{ in}
 \end{aligned}$$

K H D \* d c m

Scenario 2: How many centimeters are in 900 feet? (2.54 cm = 1 in, 12 inches = 1 foot) ft → in → cm

$$\begin{aligned}
 & \frac{900 \text{ ft}}{1} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 900 \cdot 12 \cdot 2.54 \text{ cm} \\
 & = 27,432 \text{ cm} \\
 & = 274.32 \text{ m}
 \end{aligned}$$

Scenario 3: How many gallons are in 250 mL? 1 gal = 3.8 liters 1000 milliliters = 1 liter

$$\frac{250 \cancel{\text{mL}}}{1} \cdot \frac{1 \cancel{\text{L}}}{1000 \cancel{\text{mL}}} \cdot \frac{1 \text{ gal}}{3.8 \cancel{\text{L}}} = \frac{250}{1000 \cdot 3.8} \text{ gal}$$

mL → L → gal

$$= 0.066 \text{ gal}$$

3.800

Scenario 4: One cereal bar has a mass of 37 grams. What is the mass of 6 cereal bars? Is that more or less than 1 kilogram?

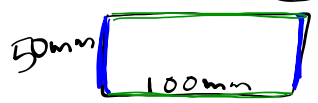
(1 bar = 37g)

$$\frac{6 \text{ bars}}{1} \cdot \frac{37 \text{ g}}{1 \text{ bar}} = 222 \text{ g}$$

$$222 = 0.222 \text{ kg} < 1 \text{ kg}$$

k H D \* d c m

Scenario 5: A rectangle has lengths of 5 cm and 100 mm. What is the perimeter & area of the rectangle in millimeters?



50 mm

$$P = 50 \text{ mm} + 50 \text{ mm} + 100 \text{ mm} + 100 \text{ mm} = 300 \text{ mm}$$

$$A = Lw = 100 \text{ mm} \times 50 \text{ mm} = 5000 \text{ mm}^2$$

Scenario 6: Mrs. Dombrowski is approximately 271,560 hours old. How many years old is she?