

More Conversions Worksheet

Key

Use Dimensional Analysis to solve the following problems.

1. How many seconds old is a 14 year old student? 44,130,640 seconds

$$14 \text{ yrs} \times \frac{365.25 \text{ days}}{1 \text{ year}} \times \frac{24 \text{ hrs}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ s}}{1 \text{ min}} =$$

2. How many miles in a 5 km race? 3.125 mi

$$5 \text{ km} \times \frac{1 \text{ mi}}{1.6 \text{ km}} =$$

3. How many kilometers in a 26 mi marathon? 41.6 km

$$26 \text{ mi} \times \frac{1.6 \text{ km}}{1 \text{ mi}} =$$

4. A person's weight is 154 pounds. Convert this to kilograms. (1 lbs. = 454 grams)

$$154 \text{ lbs} \times \frac{454 \text{ g}}{1 \text{ lb}} \times \frac{1 \text{ kg}}{1000 \text{ g}} = \boxed{69.916 \text{ kg}}$$

5. An aspirin tablet contains 325 mg of acetaminophen. How many grains is this equivalent to? (1 gram = 15.432 grains)

$$325 \text{ mg} = 0.325 \text{ g} \times \frac{15.432 \text{ grains}}{1 \text{ gram}} = \boxed{5.0154 \text{ grains}}$$

6. Uncommon Conversions. Solve using the conversion factors that are listed in the table below.

Table of Weights and Measures		
Length	Area	Volume
1 nautical mile = 6076.11549 feet	1 township = 36 square miles	4 gills = 1 pint
1 inch = 2.54 cm	*Derive your area conversion factors by working with length and squaring all dimensions.	2 pints = 1 quart
1 league = 5 280 yards	Ex.	1 liter = 1.0567 quarts
1 cable = 120 fathoms	12 ² inch ² = 1 ² foot ²	1 bushel = 4 pecks = 32 quarts
1 fathom = 6 feet	or	1 gallon = 4 quarts
1 degree = 69.047 miles	144 square inch = 1 square foot	
1 mile = 5280 feet		
1 hand = 4 inches		

- a. Your cruise ship is leaving for a 610-league adventure. How many nautical miles is this?

$$610 \text{ leagues} \times \frac{5280 \text{ yds}}{1 \text{ league}} \times \frac{3 \text{ ft.}}{1 \text{ yd}} \times \frac{1 \text{ n.m.}}{6076.11549 \text{ ft}} = \boxed{1590.226522 \text{ nautical miles}}$$

- b. Later the ship sinks and is discovered at 38 fathoms deep under water. Convert this to meters.

$$38 \text{ fathoms} \times \frac{6 \text{ ft}}{1 \text{ fathom}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ m}}{100 \text{ cm}} = \boxed{69.4944 \text{ meters}}$$

- c. If you are rationed to 32 gills of fresh water a day. How many liters is this? _____

$$32 \text{ gills} \times \frac{1 \text{ pint}}{4 \text{ gills}} \times \frac{1 \text{ quart}}{2 \text{ pints}} \times \frac{1 \text{ liter}}{1.0567 \text{ qts.}} = \boxed{3.79 \text{ liters}}$$

- d. The island has an area of 3.5 townships. How many square yards is this? (Please use scientific notation.) _____

$$3.5 \text{ townships} \times \frac{36 \text{ mi}^2}{1 \text{ township}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ yd}}{3 \text{ ft}} \times \frac{1 \text{ yd}}{3 \text{ ft}} = \boxed{3.90 \times 10^8 \text{ yd}^2}$$

- e. To reach the top of a palm tree for a coconut you will have to climb 7.4 meters. How many hands is this? _____

$$7.4 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{1 \text{ hand}}{4 \text{ in}} = \boxed{72.83 \text{ hands}}$$

- f. The island is rich with hot chile peppers. You can collect 1.6 pecks a day. How many liters could you collect in 1 week? _____

$$1 \text{ week} \times \frac{7 \text{ days}}{1 \text{ week}} \times \frac{1.6 \text{ pecks}}{1 \text{ day}} \times \frac{32 \text{ quarts}}{4 \text{ pecks}} \times \frac{1 \text{ liter}}{1.0567 \text{ quarts}} = \boxed{84.79 \text{ liters}}$$

- g. Each liter of air has a mass of 1.80 grams. How many liters of air are contained in 2.5×10^3 kg of air? _____

$$2.5 \times 10^3 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ liter}}{1.80 \text{ g}} = \boxed{1.39 \times 10^6 \text{ L}}$$

Multiple conversions

7. 16.0 grams of food contain 130 calories. How many grams of food would you need in order to consume 2150 calories? _____

$$2150 \text{ calories} \times \frac{16.0 \text{ grams}}{130 \text{ calories}} = \boxed{264.6 \text{ grams}}$$

8. The cost of 1.00 Liters of gas is 96.9 cents. How many dollars will 12.0 gallons cost? _____

$$12.0 \text{ gallons} \times \frac{4 \text{ quarts}}{1 \text{ gallon}} \times \frac{1 \text{ liter}}{1.0567 \text{ qts}} \times \frac{96.9 \text{ ¢}}{1 \text{ liter}} = \boxed{\$44.02}$$

9. Light travels 186 000 miles / second. How long is a light year in meters? (1 light year is the distance light travels in one year) _____

$$1 \text{ year} \times \frac{365.25 \text{ days}}{1 \text{ year}} \times \frac{24 \text{ hours}}{1 \text{ day}} \times \frac{3600 \text{ sec.}}{1 \text{ hour}} \times \frac{186000 \text{ mi}}{1 \text{ sec}} \times \frac{1.6 \text{ km}}{1 \text{ mi}} \times \frac{1000 \text{ m}}{1 \text{ km}} = \boxed{9.39 \times 10^{15} \text{ m}}$$

10. 1 mole of Si atoms contains 6.02×10^{23} atoms. 6.02×10^{23} atoms of Si have a mass of 28.1 g. How many atoms of Si are contained in a computer chip that masses 38.02-mg? _____

$$38.02 \text{ mg} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{6.02 \times 10^{23} \text{ atoms}}{28.1 \text{ g}} = \boxed{8.145 \times 10^{20} \text{ atoms}}$$