

Do Now: Solve the following problems using the unit conversion method. Show work!

The following equivalence statements may be helpful:

$$1 \text{ inch} = 2.54 \text{ cm} \qquad 1 \text{ foot} = 12 \text{ inches} \qquad 1 \text{ mile} = 5280 \text{ feet}$$
$$1 \text{ yard} = 3 \text{ feet} \qquad 1 \text{ gallon} = 3.785 \text{ Liters}$$

1) 2.5 L → gallons

Given:

Conversion Factor:

Final Answer:

$$X \frac{\hspace{10em}}{\hspace{10em}} =$$

2) 0.5000 miles → feet

$$X \frac{\hspace{10em}}{\hspace{10em}} =$$

3) 18 hours → seconds

$$X \frac{\hspace{10em}}{\hspace{10em}} \times X \frac{\hspace{10em}}{\hspace{10em}} =$$

4) 10.5 seconds → minutes

5) 12,583 seconds → days

6) 36.7 miles → yards

Measurement: Units & Prefixes

*Unit= any standard that is used for _____

Whenever you report a measurement, you report a _____ followed by the _____

Ex: 5 feet
 ↙ ↘
 number unit

System International (SI) Units: an international system of measurement based on the metric system. Some common ones we'll be working with:

Measurement	Base Unit	Symbol
Length	meter	
Mass	gram	
Volume	Liter	
Temperature	Kelvin	
Energy	Joule	
Frequency	Hertz	
Pressure	Pascal	
Amount of Substance	Mole	
Density	grams/milliliter or grams/centimeter ³	

K =

Prefixes: placed _____ of the base unit to indicate a larger or smaller quantity; based on powers of _____

Prefix	Symbol
Mega	M
Kilo	k
Hecto	h
Deca	da
Base (None)	(None)
Deci	d
Centi	c
Milli	m
Micro	μ
Nano	n

Helpful Mnemonic:
Ms. Karen Heats Dollar Bills.
Doesn't Chem Make μ Nervous?

Prefixes at the _____ of the chart represent a _____ amount or quantity.

Prefixes at the _____ of the chart represent a _____ amount or quantity.

Converting between metric units:

Ex: Convert 1609 meters into kilometers		
1. Identify the quantity you're starting with, including the unit 1609 m	2. Set up a conversion factor (fraction) so that you can cancel out a unit from the numerator with one in the denominator $1609 m \times \frac{km}{m}$	3. Place a "1" in front of the larger unit $1609 m \times \frac{1 km}{m}$
4. Determine the number of smaller units needed to make "1" of the larger unit $1609 m \times \frac{1 km}{1000 m}$	5. Cancel out similar units: a unit in the numerator cancels with one in the denominator if they are the same $1609 \cancel{m} \times \frac{1 km}{1000 \cancel{m}}$	6. Multiply numbers that are in the numerator; divide this by the numbers that are in the denominator. Express your final answer with the proper unit $= \frac{1609 \times 1 km}{1000} = 1.609 km$ Final Answer: 1609 m = 1.609 km

Practice: Convert the following:

1) 950 g = _____ kg

3) 0.450 μm = _____ nm

2) 35 mL = _____ dL

4) 106.1 MHz = _____ kHz

Unit Conversions Homework

Perform the following metric conversions. **SHOW WORK!**

1. 10.3 mm = _____ cm

3. 0.00419 kg = _____ ng

2. 7.2 L = _____ mL

4. 3300 mL = _____ μ L

Use the following conversions to complete these problems. **SHOW WORK!**

1 egg = 45 grams (g) 1000 g = 1 kilogram (kg) 1 kg = 2.2 pounds (lbs) 1 car = 2000 lbs

5. 500 grams = _____ pounds

6. 27 eggs = _____ kilograms

7. 500 pounds = _____ eggs

8. 3000 grams = _____ cars

Unit Conversion Activity
Chemistry

Name _____
Block _____

Use dimensional analysis to answer each of the following questions. **Show your work for each calculation.** Express your final answer **using the proper units!**

Note: conversion factors don't count towards the sig figs rule. Go by your "measured quantities" for rounding.

Task 1: Diameter of a piece of candy

Measure the diameter of 1 candy in centimeters. Convert this length into miles.

(1.6 km = 1 mi)

Task 2: Mass of a piece of candy

Measure the mass of 1 candy in grams. Convert this mass into tons.

(2.2 lbs = 1 kg 2000 lbs = 1 ton)

Task 4: Lethal Dose of Candy

The label to the right gives the nutritional information for your candy.

- a. Using your answer from task 2 and the nutrition label above, determine the amount of sugar (in grams) in 1 piece of candy.

Nutrition Facts	
Serving Size 1.5 oz (42g/about 1/4 cup)	
Serving per Container about 9	
Amount per Serving:	
Calories 170	Calories from Fat 15
% Daily Value*	
Total Fat 2g	3%
Saturated Fat 2g	10%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 39g	13%
Dietary Fiber 0g	0%
Sugars 32g	
Protein 0g	

- b. The lethal dose of sugar is 29,700 mg of sugar/kg of body weight. Using your answer above, calculate the total number of candies a 60 kg person would have to consume in a short period of time to reach the lethal dose.