

Here's the list of elements to memorize for Friday.

Less than half of the quiz will be element questions.

Cr is chromium  
Mn is manganese  
Fe is iron  
Ni is nickel  
Cu is copper  
Zn is zinc  
Br is bromine  
I is iodine

Sn is tin  
Pb is lead  
Ag is silver  
Au is gold  
Hg is mercury  
Sr is strontium  
Ba is barium  
U is uranium  
Pu is plutonium

### Purpose:

Day 3 of practicing Dimensional Analysis.

1000 g is 1 kg

### WARMUP :

Copy and solve. "What would be the volume of 59 kilograms of lead?"

$$\frac{(59 \text{ kg})}{1} * \frac{(1000 \text{ g})}{(1 \text{ kg})} * \frac{(1 \text{ mL})}{(11.35 \text{ g})}$$
$$= 5198 = 5200 \text{ mL}$$

"If you had  $3.0 \times 10^5$  mL of lead what would its mass be in grams?"

$$3.0 \times 10^5 \text{ mL} * \frac{(11.35 \text{ grams})}{(1 \text{ mL})} = 3405000 = 3400000 \text{ grams}$$

Today:

1) HW check

2) 5 minute challenge: Each pod solves a problem live at the board

3) Team Lift

Expect some questions like this Friday:

	IODINE
Au	
Ag	
	lead
Sn	
	iron

Don't hand this in. Keep it as class notes.

October 7, 2015.

1. If there are 2.54 cm in 1.00  
inche, How many feet are in  
613.2 cm?

$$613.2 \text{ cm} \times \left( \frac{1 \text{ in}}{2.54 \text{ cm}} \right) = \frac{241.4173228 \text{ in}}{241.4 \text{ inches} / 12}$$

2. If there are 2.54 cm in 1.00  
inche, how many yards is  
75.3 cm?

$$75.3 \text{ cm} \left( \frac{1 \text{ inches}}{2.54 \text{ cm}} \right) \left( \frac{1 \text{ yards}}{36 \text{ inches}} \right) = 1067.24$$

*• 8234 yards*

3. How many seconds are  
there in 7.3 hours?

$$7.3 \text{ hours} \left( \frac{60 \text{ minutes}}{1 \text{ hour}} \right) \left( \frac{60 \text{ seconds}}{1 \text{ minute}} \right) = 26280$$

*26000 seconds*

4. If there are 5280 feet in  
1.00 mile, how many miles  
are in 60.5 inches?

$$60.5 \text{ in} \left( \frac{1 \text{ ft}}{12 \text{ in.}} \right) \left( \frac{1.00 \text{ mile}}{5280 \text{ ft}} \right) = 9.548$$

*9.55 x 10<sup>-4</sup> miles*

5. How many centimeters are  
in 3.9 miles?

$$\frac{5280 \text{ ft}}{1 \text{ mile}}, 3.9 \text{ mile} \cdot \frac{30.54 \text{ cm}}{1 \text{ ft}} = 62887.16 \text{ cm}$$

*6.3 x 10<sup>5</sup> cm*

6. Julia is planning a party for  
15 people. She wants to order  
enough pizza so that every  
person can have 4 slices. When  
she calls the pizza place, they  
tell her that a large pizza is cut  
into 12 slices and costs \$14.78.  
How much money will Julia  
need in order to feed all of her  
guests?

7. The moon is 250,000  
miles away. How many  
feet is it from earth if  
There are 5280 feet in 1.00  
mile

8. If a swimmer swims 85.4  
yards in five minutes, how  
many feet will she swim in 70.0  
seconds?

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October 7, 2015.



#1

**Step One:** Underline the starter unit (the unit that is not paired with another unit. Circle pairs of units. Draw a box around the goal unit.

What is the volume of a  $5.77 \times 10^6$  gram piece of tin? You may need a table from Page 2. (BTW, Do you know the symbol for tin for this Friday's quiz?)

**Step Two:** Write down the important info here.

What's the starter number?

What is the goal unit?

Write all the 'for every' statements that will make useful conversion factors.

#2

**Step One:** Underline the starter unit (the unit that is not paired with another unit. Circle pairs of units. Draw a box around the goal unit.

There are 30.48 cm in 1.000 feet and there are 5280 feet in one mile. What would be the mass, in grams, of 2.00 cubic miles of iron?

**Step Two:** Write down the important info here.

What's the starter number?

What is the goal unit?

Write all the 'for every' statements that will make useful conversion factors.

For every 1 mile there are  
160000 cm.

**Step Three:** Solve below using dimensional analysis. Write words before you write numbers.

$$5.77 \times 10^6 \text{ g} \times \left( \frac{1 \text{ mL}}{7.31 \text{ g}} \right) = 7.89 \times 10^5$$

789000  
ML

**Step Three:** Solve below using dimensional analysis. Write words before you write numbers.

**CHALLENGE**  
ADVANCED STUDENTS ONLY!

$$2.00 \text{ miles}^3 \times \left( \frac{160000 \text{ cm}}{1 \text{ mile}} \right) \times \left( \frac{160000 \text{ cm}}{1 \text{ mile}} \right) \times \left( \frac{160000 \text{ cm}}{1 \text{ mile}} \right) \times \left( \frac{7.87 \text{ grams}}{1 \text{ cm}^3} \right) =$$

Answer

~~$6.45 \times 10^{16} \text{ grams}$~~   
 $6.45 \times 10^{16} \text{ grams}$

For the speedometer shown in Figure 1, what is the speed in feet per minute?

$$\frac{153 \text{ miles}}{1 \text{ hour}} \times \frac{5280 \text{ feet}}{1 \text{ mile}} \times \frac{1 \text{ hour}}{60 \text{ minute}} = 13500 \frac{\text{feet}}{\text{minute}}$$

pepperonis are 15 grams each and you eat 2.5 pizzas, how many grams of pepperoni did you

$$\frac{2.5 \text{ pizzas}}{1} \times \frac{12 \text{ pepperonis}}{1 \text{ pizza}} \times \frac{15 \text{ gram}}{1 \text{ pepperoni}} = 450 \text{ grams}$$

What's the volume, in cm<sup>3</sup> of 1.0 cubic mile of Sp?

$$1.0 \text{ mile}^3 \times \frac{\text{cm}}{\text{mile}} \times \frac{\text{cm}}{\text{mile}} \times \frac{\text{cm}}{\text{mile}}$$

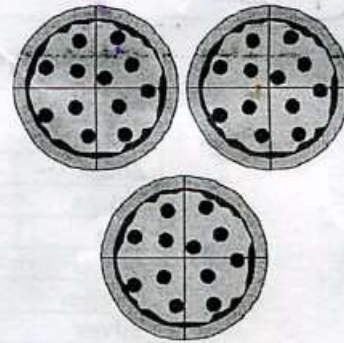
If a small lead statue of Donald Trump has a mass of  $8.3 \times 10^{-4}$  grams, what is its volume?

$$\frac{8.3 \times 10^{-4} \text{ g}}{1} \times \frac{1 \text{ mL}}{11.35 \text{ g}} = 7.3 \times 10^{-5} \text{ grams}$$

How much pressure will 1.53 meters of dry uncompact ash make on a roof?

$$\frac{1.53 \text{ m}}{1} \times \frac{\text{mm}}{\text{m}} \times \frac{\text{kPa}}{\text{mm}}$$

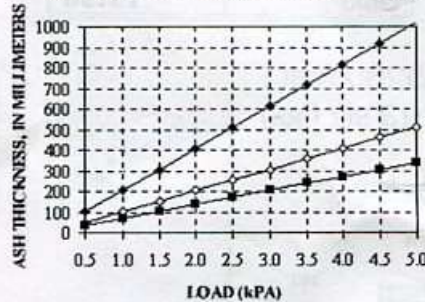
Substance	Density (g/mL)
Aluminum	2.70
Titanium	4.54
Zinc	7.13
Tin	7.31
Iron	7.87
Nickel	8.90
Copper	8.96
Silver	10.50
Lead	11.35
Mercury	13.55
Gold	19.30



There are 5280 feet in 1.00 mile (3 sig figs)



Loading of Volcanic Ash on Roofs



—●— Dry Uncompact Ash ( $p = 500 \text{ kg m}^{-3}$ )  
 —○— Dry Compact Ash ( $p = 1000 \text{ kg m}^{-3}$ )



Using units correctly

**EHS** CA3MIS+ry

Mr. Genest



Name

Date

**ANSWERS**

Tutors! Adults! Help this young chemist by visiting <http://genest.weebly.com> with any smart phone

Don't calculate. Just fill in the blanks, using Figure 1 or prior knowledge to create some conversion factors. Look at your Monday notes if you're not sure what a 'conversion factor' is.

3.  $\left\{ \frac{7.13 \text{ grams Zn}}{1 \text{ mL Zn}} \right\}$

4.  $\left\{ \frac{3 \text{ pizza}}{12 \text{ slices}} \right\}$

5.  $\left\{ \frac{36 \text{ pepperonis}}{12 \text{ slice}} \right\}$

$\frac{1}{4}$  OKAY TOO!

$\frac{3}{1}$  OKAY TOO!

6.  $\left\{ \frac{1 \text{ mL Tin}}{7.31 \text{ g Tin}} \right\}$

7.  $\left\{ \frac{\text{mm dry Ash}}{\text{kg}} \right\}$

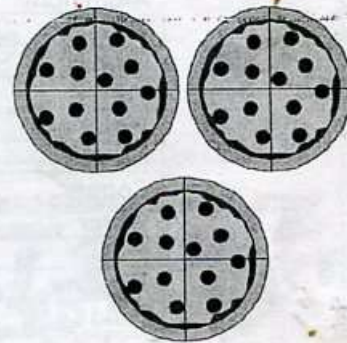
8.  $\left\{ \frac{\text{hours}}{\text{miles}} \right\}$

9.  $\left\{ \frac{\text{mL Al}}{\text{g Al}} \right\}$

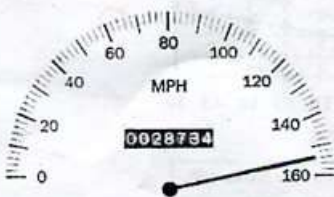
10.  $\left\{ \frac{\text{miles}}{\text{hour}} \right\}$

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