



Dimensional Analysis

(2 step problems)

(Refer to: Holt Science Spectrum p. 17 or the web at: <http://www.alysion.org/dimensional/analysis.htm> and <http://www.alysion.org/dimensional/fun.htm>)

Objectives:

1. Student will be able to change units for a given quantity--**without changing the amount.**
2. Student will recall basic units and memorize unfamiliar units listed below.

Units to know:

Every student should know the following units. These were given on the last worksheet and should be committed to memory. Units in **bold** type are **SI** (Système Internationale): All of the following need to be memorized by the quiz on Friday, March 25.

TIME

___ year = ___ months
___ year = ___ days
___ d. = ___ h.
___ min. = ___ s
___ decade = ___ years
___ century = ___ years

WEIGHT

___ lb. = ___ oz.
___ lb. = ___ g
___ **kg** = ___ **g**
___ **g** = ___ **mg**

VOLUME

___ L = ___ mL
___ mg = ___ mL

NUTRIENTS & ENERGY

___ g fat = ___ C
___ g protein = ___ C
___ g CHO = ___ C
___ mile = ___ C
___ C = ___ c
___ c = ___ **j (joule)**

Exercises:

In the following questions, show all work or NO credit.

1. “The most important time is time we waste with those we love.”
 - a. How many centuries in a 23 year? [use \geq two equivalencies]

 - b. How many years in a 2.3 centuries? [use \geq two equivalencies]

 - c. How many decades in a 29 months? [use \geq two equivalencies]

- d. How many months in 0.7 decades? [use \geq two equivalencies]

- e. How many seconds in 13 hours? [use \geq two equivalencies]

- f. How many hours in 1592 seconds? [use \geq two equivalencies]

- g. How many days in 13 minutes? [use \geq two equivalencies]

2. Nutrients & Exercise

- a. How many grams of water in 3.54 L? [use \geq two equivalencies]

- b. How many L of water in 560 g of water? [use \geq two equivalencies]

- c. How many grams of fat contain the calories found in 15 grams of protein? [use \geq two equivalencies]

- d. How many grams of carbohydrate contain the calories found in 27 grams of protein? [use \geq two equivalencies]

- e. How many joules in 35 C? [use \geq two equivalencies]

- f. If Scotty run 4.3 miles, how many calories [**Careful!**] will Scotty use? [use \geq two equivalencies]
- g. How many grams of fat will Scotty burn if he runs 4.3 miles? [use \geq two equivalencies]
- h. How many miles will Scotty have to run to lose 10 g of fat? [use \geq two equivalencies]
- i. If Scotty wants to lose 5 pounds of fat (ie. Lose weight) how many Calories will that be? [use \geq two equivalencies]
- i. How many miles will he have to run to burn that much energy?
- j. More Challenging:**
- i. If you just eat one extra piece of bread in a day (about 60 Calories), how many Calories would that be in one year? [use \geq two equivalencies]
- ii. If all that bread went straight to fat, how many pounds of fat would you gain in one year? [use \geq two equivalencies]
- iii. How many miles would you have to run that year to burn up all that extra energy? [use \geq two equivalencies]