

Name: _____

Blk: _____ Date: _____

Chemistry 11
SIMPLE UNIT CONVERSIONS

In chemistry you must be able to **PROBLEM SOLVE** using the **UNIT CONVERSION METHOD**....do not cheat yourself by using any other method!!!

The **unit conversion method** has three primary components:

- A. The initial amount (and it's UNIT)**
- B. The conversion factor (and it's UNITS)**
- C. The unknown amount (and it's UNIT)**

And it is written in the form **$C = A \times B$**

Ex.1 What is the cost of 2 doz Tim Hortons® donuts if they cost \$5.35/doz?
FIRST YOU MUST IDENTIFY THE PRIMARY COMPONENTS

C =

A =

B =

NOW PUT IT ALL TOGETHER:

Ex. 2 If 0.200 mL of platinum has a mass of 4.12 grams, what is the mass of 5.00 mL of platinum?

FIRST YOU MUST IDENTIFY THE PRIMARY COMPONENTS

C =

A =

B =

NOW PUT IT ALL TOGETHER:

Seat work/ Homework : Exercises: 1 + 2

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1. For each of the following problem statements identify
- the unknown amount and its unit,
 - the initial amount and its unit, and
 - the conversion factors and their units.

(You aren't required to put everything together and solve the problem yet ... that comes next.)

- a) If a chemical costs \$50 per gram, what is the cost of 100 g of the chemical?
- b) Computer disks cost \$6.00 for 10 disks. How many disks can you buy for \$36.00?
- c) Cork has a density of 0.35 g/mL. What is the volume of 20 g of cork?
- d) If 3 kiwi fruit sell for \$1, how many kiwi fruit can you buy for \$5?
- e) If 4 bims are worth 5 tuds, how many bims can you buy for 30 tuds?
- f) A farmer trades 2 cows for 7 goats. At this rate, how many goats can he get for 10 cows?
- g) One mole of oxygen has a mass of 32 g. What is the mass of 5.5 moles of oxygen?
- h) One molecule of sulphur contains 8 sulphur atoms. How many sulphur molecules can be made from 104 sulphur atoms?
- i) How long must an electrical current of 35 coulombs/s flow in order to deliver 200 coulombs?
- j) What temperature increase is caused by 100 kJ of heat if 4.18 kJ of heat causes a 1°C increase in temperature?

2. Solve the following using the method of unit conversions.

- a) If there are 6.02×10^{23} atoms in 1 mol of atoms, how many atoms are there in 5.5 mol of atoms?
- b) If one mole of a gas has a volume of 22.4 L, how many moles are there in 25.0 L of gas?
- c) If one mole of nitrogen has a mass of 28 g, how many moles of nitrogen gas are in 7.0 g of nitrogen gas?
- d) How many seconds must an electrical current of 35 coulombs/s flow in order to deliver 200.0 coulombs?
- e) A quiet sound exerts a pressure of 4×10^{-8} kPa ("kPa" = kilopascals, an SI pressure unit). What is this pressure in atmospheres if 1 atmosphere is 101.3 kPa?
- f) A large nugget of naturally occurring silver metal has a mass of 3.20×10^4 troy ounces. What is the mass in kilograms if 1 troy ounce is equivalent to 0.0311 kg?
- g) A reaction is essentially complete in 5.0×10^{-4} s. If one millisecond (1 ms) equals 10^{-3} s, how many milliseconds does the reaction take?
- h) If 1 mol of octane produces 5450 kJ of heat when burned, how many moles of octane must be burned to produce 15 100 kJ of heat?
- i) Our fingers can detect a movement of 0.05 micron. If 1 micron is 10^{-3} mm, what is this movement expressed in millimetres (mm)?
- j) If concentrated hydrochloric acid has a concentration of 11.7 mol/L, what volume of hydrochloric acid is required in order to have 0.0358 mol of hydrochloric acid?