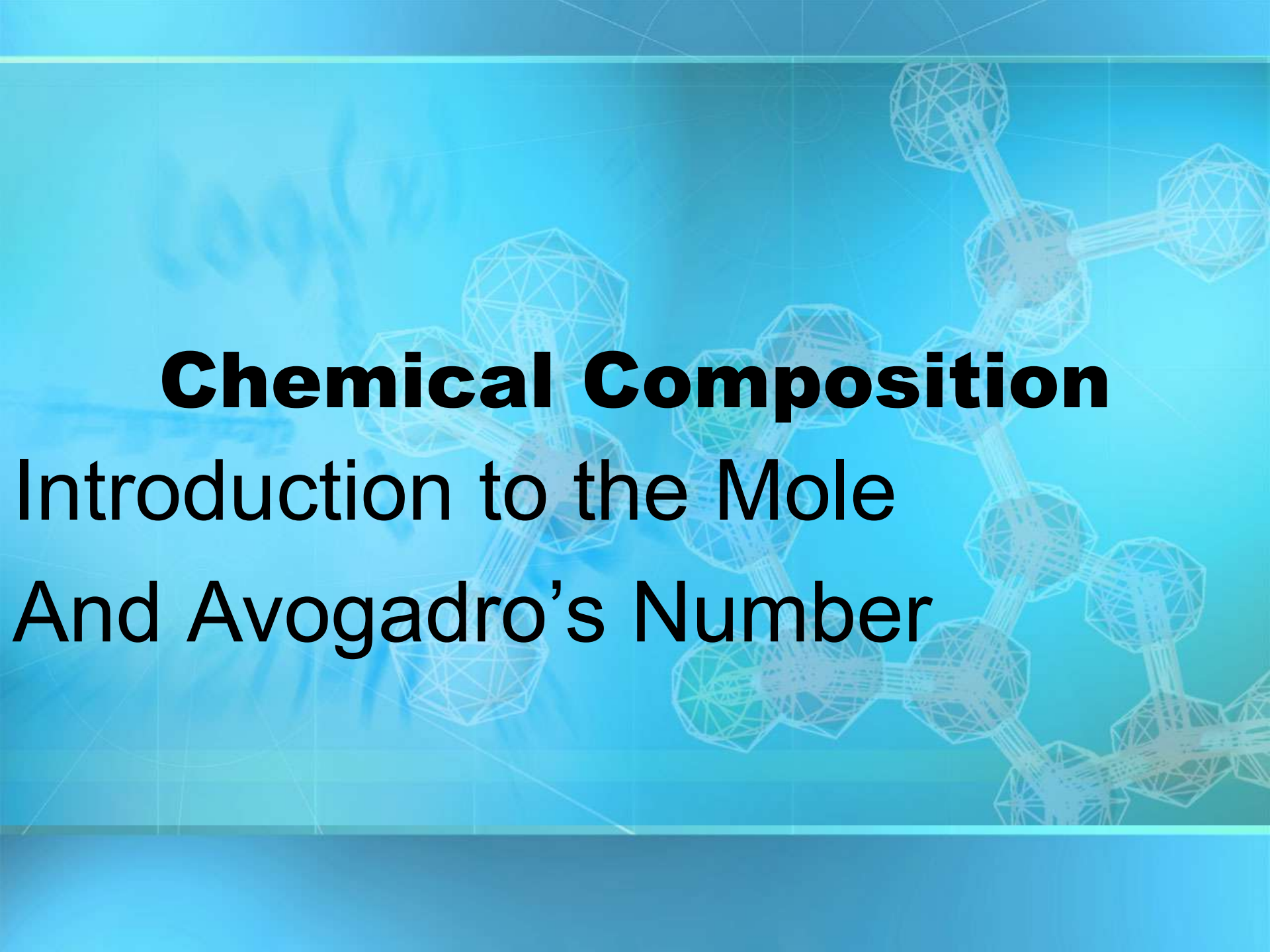
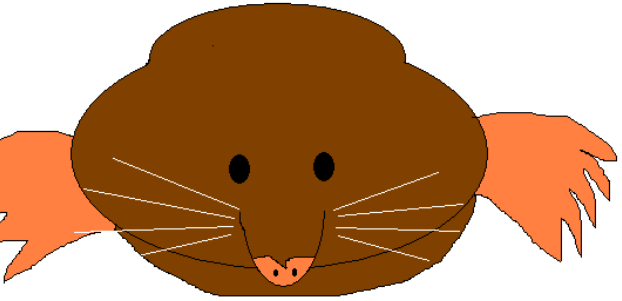


Chemical Composition

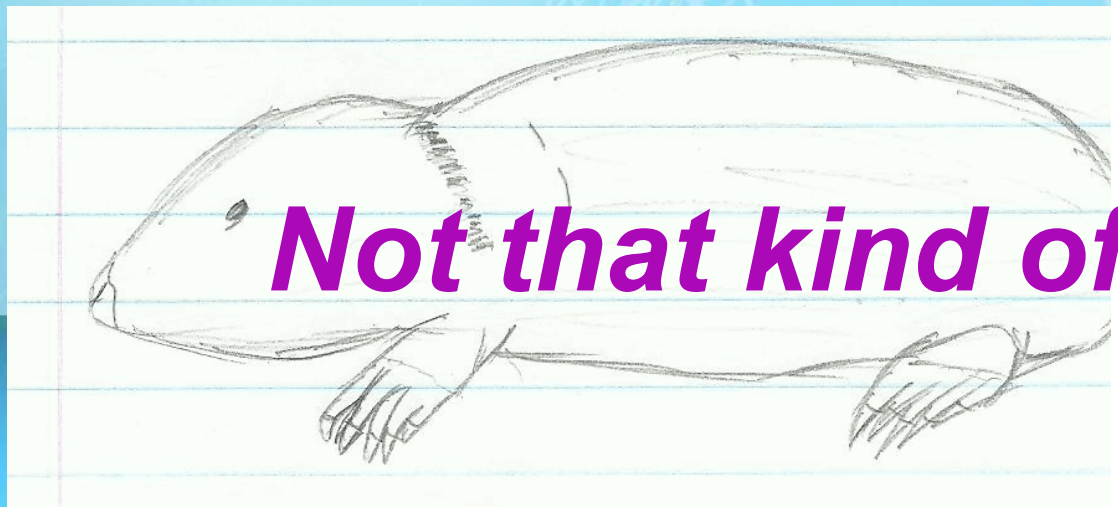
Introduction to the Mole

And Avogadro's Number

The Mole



Not that kind of Mole!



Not that kind of Mole either!

This kind of mole…

- The mole (abbreviated mol) is defined as the number equal to the number of carbon atoms in 12.01 grams of carbon

HUH???

One mole = 6.022×10^{23} units of any substance

That's a BIG number! So we call it Avogadro's number for short.

Avocado?

Not Avocado

Avogadro

Yikes!
I'd rather eat an avocado hee hee

chemically speaking,

6.02 x 10^{23} of anyth

(We w… about a mole… or molecule)

So hov…

6.0…

So ho… le of H_2O?

6.…

So … of shoes?

6.02 x …

How about this…

So how many atoms are in 2 moles of Mg?

2 x 6.0

We'l

worl

So how m H_2O?

3 x 6.0

So how many shoes are in 4 moles of shoes?

$4 \times 6.02 \times 10^{23}$

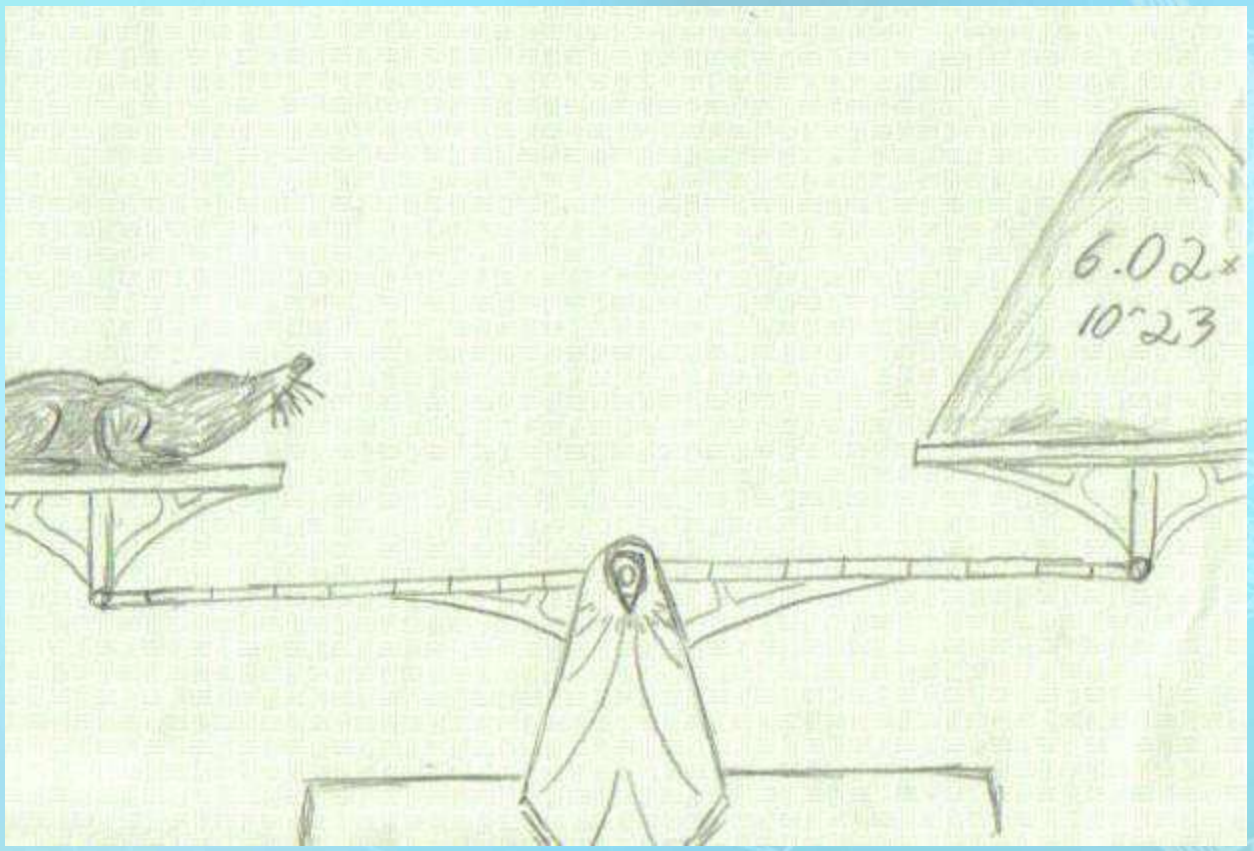
It's just like...

If there are 12 eggs in a dozen,

how many eggs are in 2 dozen eggs

Well that's easy: 2 x 12 = 24 eggs

The mass of a mole is a topic that you will be asked to understand in this unit.



Ohh NOOO that sounds like Math!

It is Math but not it's not too complicated-

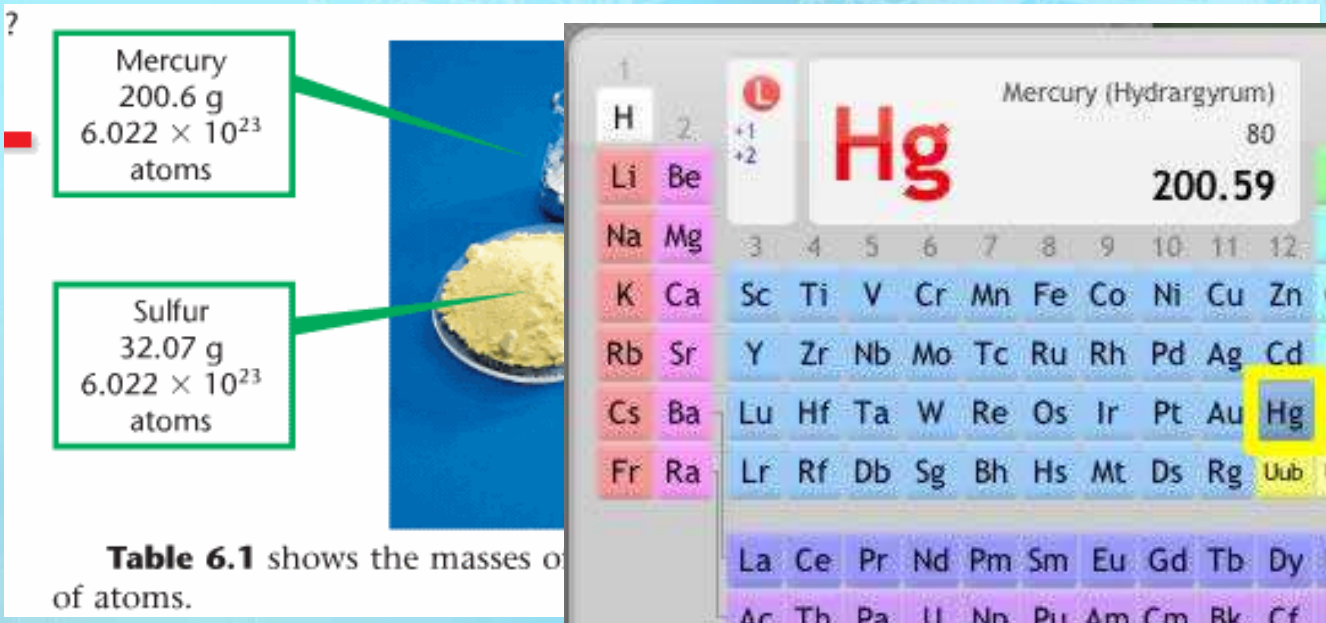
For example if one dozen eggs has a mass of 20 grams, 

how many grams do 2 dozen eggs have?

Well that's easy: 2 x 20 grams= 40 grams

What is the mass of 1 mole of something?

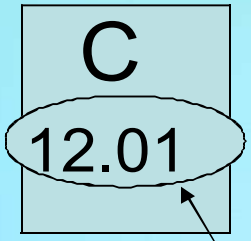
Well… that changes with the "something" you are talking about



Do the masses look familiar? They should…they can be found on the periodic table

It is Math but not it's not too complicated- you already know some of this...

Carbon



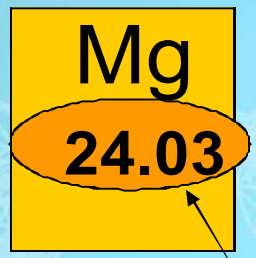
Molar Mass

=12.01 g

= 1 mole

= 6.02 x 10^{23} atoms= Avogadro s number

Sodium



Molar Mass

=24.03 g

= 1 mole

= 6.02 x 10^{23} atoms= Avogadro s number

So…

A mole is like a dozen…sort of….

Dozen represents a number

(12)

Mole represents a number

(6.02×10^{23})

so…

The NUMBER in a mole of something doesn't change

The MASS of a mole of something does change

A mole of feathers would have much less mass than a mole of bowling balls. Just like a dozen feathers would weigh less than a dozen bowling balls

The End