



Chemistry B



THE MOLE!!!



Let's Take A Quiz

Ready?
Let's Go!

What is a mole?

- A.) A blind furry animal.
- B.) A brown mark on your body.
- C.) An important Chemistry concept.
- D.) All of these.



Photo courtesy of S. Tim Sheehan

*As you may have guessed, D is
the correct answer!!*

Although a mole might be cute and
fuzzy, we are going to focus on the
Chemistry concept.



Photo courtesy of S. Tim Sheehan

A mole is a counting unit.

Just like:


- 12 eggs equals a dozen eggs
- 144 pencils equals one gross of pencils
- 60 seconds equals one minute
- 500 sheets of paper equals one ream

One mole equals 6.02×10^{23} particles

- So one *mole* of eggs would be 6.02×10^{23} eggs
- One mole of pencils would be 6.02×10^{23} pencils
- And so on...

Where did the mole come from?

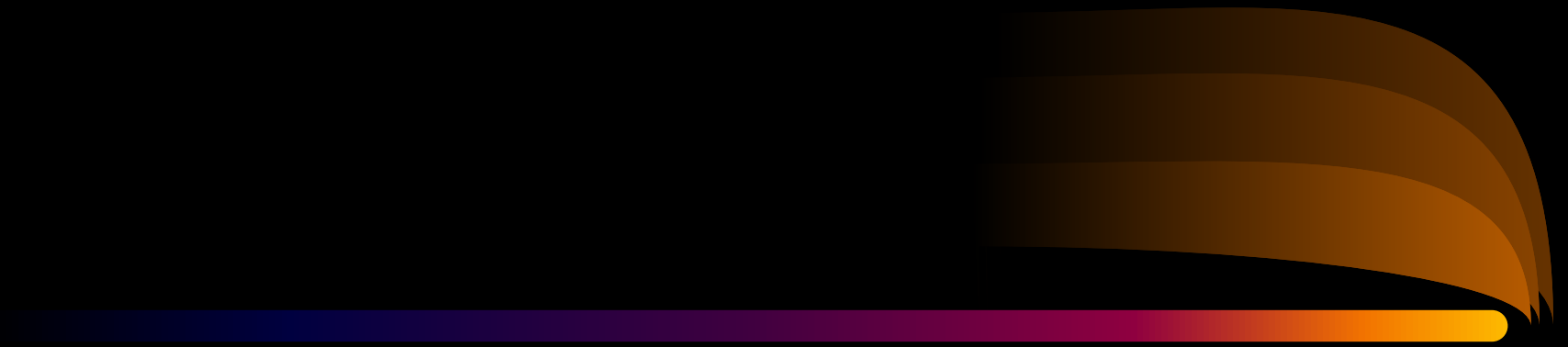
- The unit, called the mole (or mol), is defined as the number of atoms in exactly 12g of the carbon-12 isotope

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- The number of particles in one mole,
 - 6.02×10^{23} , is known as Avogadro's number.
 - This was named after Amedeo Avogadro (1776-1856) whose ideas were crucial to the early development in Chemistry

6.02×10^{23} is a very large number!

- If we did not use scientific notation to write out 6.02×10^{23} , we would write out 602 with 21 zeros after it.
- Why don't we try it.





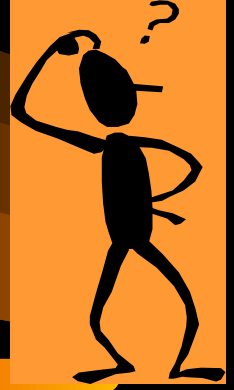
602,000,000,000,000,000,000

Wow that is a BIG number!!

*Imagine that we had a mole of
gumballs.*

If all 6 billion people on Earth were
to do nothing but count the gumballs
in one mole at the rate of one gumball
per second, it would take over 3
million years to count all the
gumballs!!

What is all of this used for?



- Avogadro's number can be used to convert an amount of moles into the equivalent number of particles (atoms, molecules, etc.).
- This conversion is similar to changing 8 dozen eggs into the number of individual eggs.

Now you are ready for some mole jokes!



- Who is Avogadro's favorite actor?
- Mol Gibson.... Get it? Ha ha
- Where did Avogadro go on Saturday?
- The shopping mole.. Wow these are funny!
- What did Avogadro have on his pancakes?
- Molasses!! I know you may think these jokes are remolting, but you will grow to love them!!

What did you say? One more mole joke? If you insist.

- Why did Avogadro look forward to the year 2000?
- It was the start of the new molennium!!!

