SG#1

Welcome to Chemistry!

Chemistry is the study of matter and how matter changes.

Using your glossary, define these words:

1. Matter: anything that has mass and takes up space

2. Elements: a substance that consists of only ONE type of atom

3. Atoms: a small particle that is the building block of matter; the smallest piece of an element that still represents that element

Remember that we cannot see atoms with our eyes!

Basic parts of an atom:

A. Nucleus: small core of an atom; contains protons and neutrons. It contains 99.9 % of an atom's mass.

B. Protons: Positively charged particles found IN the nucleus. The mass of a proton is approximately 1 amu. An amu is an atomic mass unit = to approximately 1.66×10^{-24}g

C. Neutrons: Neutral particles found IN the nucleus. The mass of a neutron is approximately 1 amu.

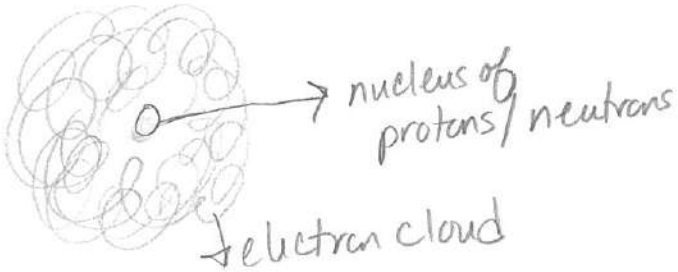
D. Electrons: Negatively charged particles found OUTSIDE the nucleus. The mass of an electron is about $1/2000^{th}$ the mass of the proton & neutron.

- In an uncharged atom, the number of electrons EQUALS the number of protons. If an atom has 8 electrons it also has 8 protons.

- Go to P. 322 Scientists believe it is impossible to know both the __speed_____ and the exact location of an electron at any given moment. The electron cloud is mostly empty_____ space_____.

- Electrons are arranged in the electron cloud in __energy_____ __levels_____. *Level 1* can hold up to 2 electrons, *Level 2* can hold up to 8 electrons, and *Level 3* can hold up to 18 electrons.

Also on p.322: The modern model of the atom shows a nucleus which contains both protons and neutrons and that nucleus surrounded by the electron _cloud____. Electrons are more likely to be found closer to the ___nucleus___ than farther away. Electrons constantly __move around the nucleus.
Draw the modern model here:



BUT…. How did we get here?

Atomic Theory Timeline (start on p. 312)

1. Early ideas about matter (about 2000 years ago)
   A. What did the Greek philosophers did all matter was made from?
   ___fire, air, earth, and water_____
   B. Usually those ideas proposed by the philosophers with the greatest_influence__were accepted by the public (and other philosophers)
   C. ____Democritus___ (460 – 370 BC) challenged the popular idea of matter.
      a. believed that matter was made of small _solid_ objects that cannot be divided
      b. called the objects __atomos (Latin for uncuttable)_ (where we get atom from)
      c. also said different types of matter are made from different types of

___atoms_____

d. also said that nothing is between the atoms but empty__ space

e. No way to _test__ his ideas, but they were very similar descriptions we use today

f. ideas did not conform to popular_ opinion, could not be tested, so they were open to debate