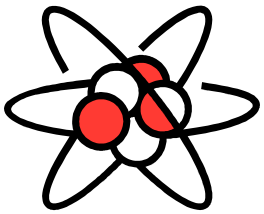

Name _Answers_____
Date _____ Hour _____

Overview of Atomic Modeling:

1. Our understanding of the atomic model has changed considerably over the past 200 years. Describe how and why our understanding has changed.

   Initially (Greeks – more than 2000 years ago) – Defined atoms as the smallest piece of matter
   - Indivisible
   - Hard, tiny, solid particles

   Dalton (early 1800s) – Refines idea by considering how atoms connect to all the substances around us.
   - Everything (all elements) is made of atoms.
   - Atoms can be joined together.
   - Atoms of the same element are identical and atoms of different elements are not identical.
   - Atoms are indivisible.

   Thomson (late 1800s) – Discovers that elements are not indivisible.
   - Atoms are made of smaller particles & these particles have charge (positive and negative).
   - Positive and negative charges are randomly spread throughout the atom.

   Rutherford (early 1900s) – Discovers that charges are not randomly dispersed throughout the atom.
   - Positive charges are clustered in the center of the atom (nucleus).
   - Most of the atom is empty space.
   - Negative charges are randomly found around the nucleus.

   Bohr (early 1900s) – Discovers that negative charges (electrons) are not randomly arranged around the atom.
   - Negative charges are found in specific locations/distances from the nucleus.
   - Electrons follow a path/orbit around the nucleus.

   Currently – Discover that electrons do not follow a specific path around the nucleus.
   - Electrons are found in different energy levels (and distances) from the nucleus, but they do not move following a specific path.
   - There are neutral particles (neutrons) in the nucleus.

2. What are valence electrons?

   Valence electrons are the electrons found in the outmost (last, highest) energy level.

3. What does the atomic number tell you about an element?

   Atomic numbers identify an atom and indicate the number of protons in an atom.

4. What is the atomic mass?

   The atomic mass is the weight of the protons and neutrons together (the nucleus).

5. What is similar about nitrogen and phosphorus? (You should be able to see at least 2 similarities)

   Nitrogen and phosphorus are both non-metals with 5 valence electrons.

6. How many protons does aluminum (Al) have?
   13 protons

7. How many neutrons does chlorine (Cl) have?
   35-17 = 18 neutrons

8. How many valence electrons does argon (Ar) have?
   8 valence electrons

9. Why are electrons not included in the atomic mass?
   Electrons have almost no weight compared to protons and neutrons. (They are only 1/2000th of the weight.)

10. Find sulfur on your periodic table.
    a. What is the element's symbol? _S_
    b. What is the atomic number? _16_
    c. Number of protons: _16_
    d. Number of neutrons: _16_
    e. Number of electrons: _16_
    f. Number of valence electrons: _6_
    g. Is it a metal or nonmetal? _non-metal_
    h. Is it naturally occurring or synthetic (artificially made)? _naturally occurring_
    i. Diagram this atom: