Atoms and Elements Guided Notes

- Atoms are incredibly small

1. An atom is the smallest identifiable unit of an element.
2. An element is a substance that cannot be broken down into simpler substances.
3. Democritus called atoms "atomos" which means indivisible.
   -first scientist to postulate that matter is composed of atoms.

Dalton's Atomic Theory:

1. Each element is composed of tiny, indestructible particles called atoms.
2. All atoms of a given element have the same mass and other properties that distinguish them from the atoms of other elements.
3. Atoms combine in simple, whole-number ratios to form compounds.

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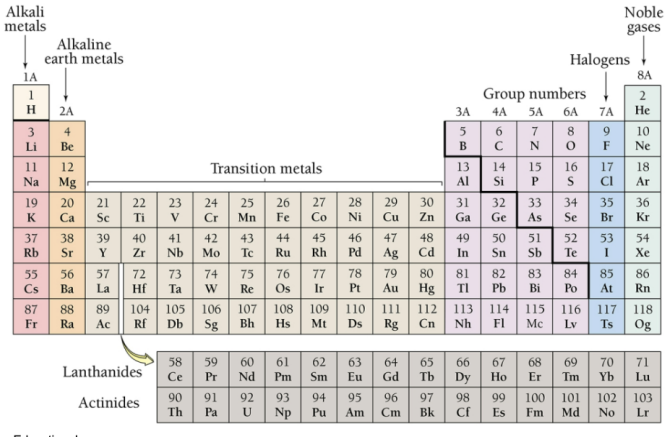
4. Who is given credit for discovering the electron? JJ Thomson
5. Thomson used the Plum Pudding Model to describe his discovery mentioned above.
6. Whis is given credit for discovering the atomic nucleus? Rutherford
7. Rutherford used the Gold Foil Experiment to describe his discovery mentioned above
8. Protons and Neutrons have charge

Protons	Neutrons	Electrons
-Positive Charge -Equal to the Atomic Number -1 amu -Dwells in the Nucleus	-Neutral Charge -1 amu -Dwells in the Nucleus -Causes isotopes	-Negative Charge -1/20000th amu -Dwells outside the Nucleus -Causes ions

9. Like charges repel
10. Opposite charges attract
11. Demitri Mendeleev organized the periodic table
12. The elements in the periodic table can be broadly classified as metals, nonmetals, and metalloids

Metals	Metalloids	Nonmetals
-Occupy the left side of the periodic table -Good conductors -Metals can be pounded into flat sheets (malleability). -Metals can be drawn into wires (ductility). -Metals are often shiny (lustrous). -Metals tend to lose electrons when they undergo chemical changes forming positive ions. -Good examples of metals are iron, magnesium, chromium, and sodium	-lie along the zigzag diagonal line dividing metals and nonmetals. -Metalloids, also called semimetals, display mixed properties -Metalloids are also called semiconductors because of their intermediate electrical conductivity, which can be changed and controlled -This property makes semiconductors useful in the manufacture of electronic devices that are central to computers, cell phones, and other modern gadgets -Silicon, arsenic, and germanium are good examples of metalloids. -Silicon is shown here	-occupy the upper right side of the periodic Table -The dividing line between metals and nonmetals is the zigzag diagonal line running from boron to astatine -Nonmetals have more varied properties; some are solids at room temperature, while others are gasses. -As a whole, nonmetals tend to be poor conductors of heat and electricity. -Nonmetals tend to gain electrons when they undergo chemical changes. -Good examples of nonmetals are oxygen, nitrogen, chlorine, and iodine



13. Positive ions are called cations (loss of electrons)
14. Negative ions are called anions (gain of electrons)
15. Atoms with the same number of protons but different numbers of neutrons are called isotopes.
16. All elements have their own unique percent natural abundance of isotopes
17. mass= protons + neutrons