Unit 3 Notes

1. Matter is classified as mixtures, elements, or compounds.
   A. _____ are 2 or more substances mixed together, but not _____ combined. The substances can be elements or compounds.
      1. Examples:

      2. The individual parts keep their own _____ and _____
      3. The parts can be separated by simple means such as _____ _____
      4. The parts are present in any _____.
         Example: Trail mix can have lots of m and m's and a few peanuts, or a few m and m's and lots of peanuts, but it's still trail mix.

      5. Mixtures can look the _____throughout (_____) or
         Show the _____parts (_____,_____)

   B. _____ are the simplest pure substance.
      1. Examples:

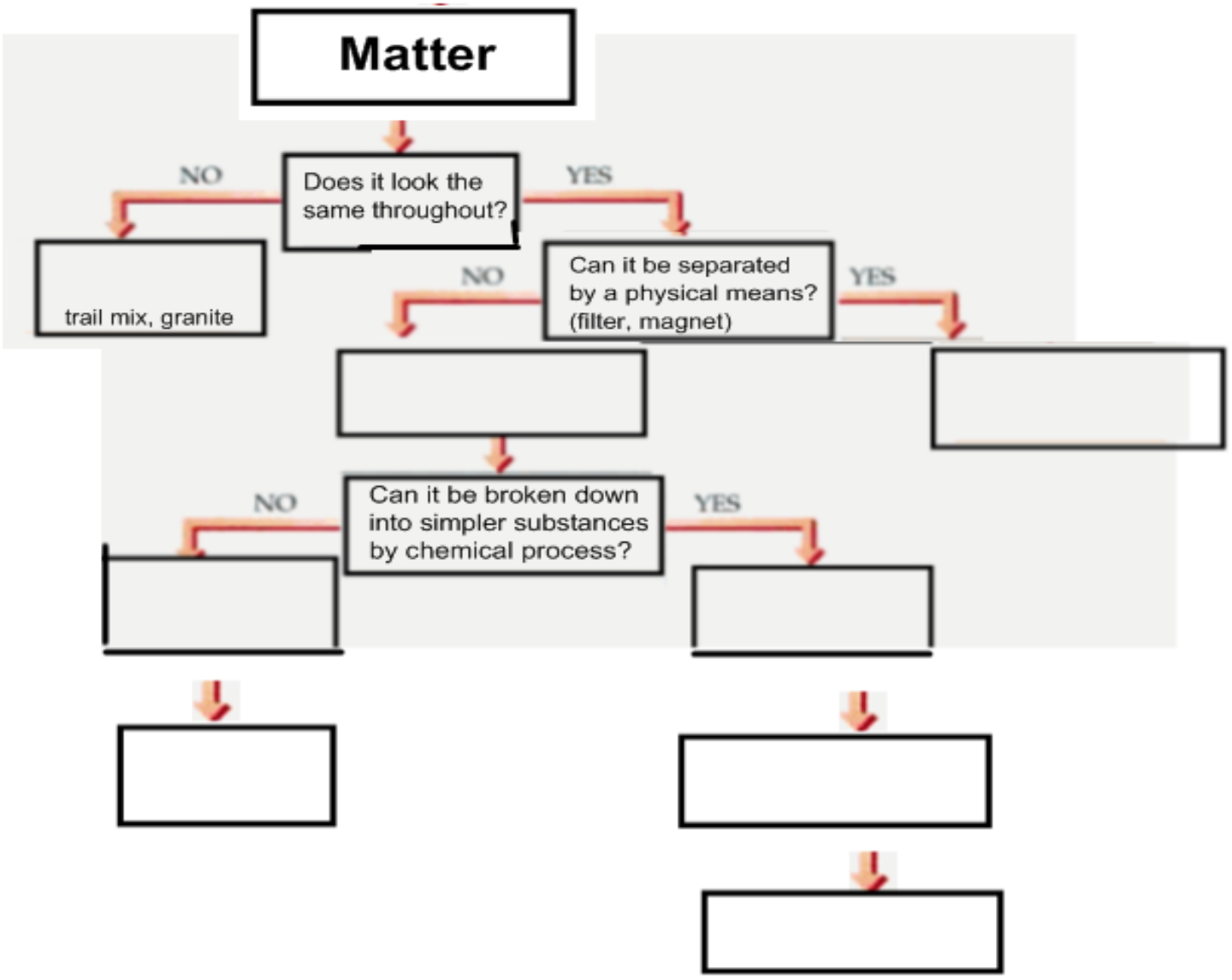
      2. Elements are listed on the _____
      3. Elements are represented by_____. Each symbol is either one _____letter or one capital letter followed by a _____case letter. Examples:

      4. Elements can **NOT** be broken into _____substances by _____ or a chemical reaction.

      5. They contain only one type of _____.

   C. _____ are pure substances made of _____ or more _____ that are _____combined.
      1. Examples:

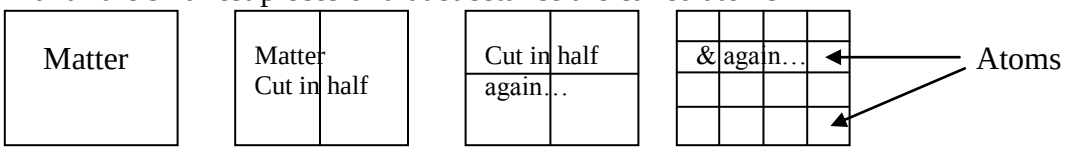
      2. Compounds can be broken down into simpler substances by _____reaction.
      3. Compounds are represented by a _____ _____
         Examples:
      4. Chemical formulas are like recipes. They tell which elements are in the compound and how many of each.


Matter
Does it look the same throughout?
NO
YES
trail mix, granite
Can it be separated by a physical means? (filter, magnet)
NO
YES
Can it be broken down into simpler substances by chemical process?
NO
YES

Atomic Structure and the Periodic Table

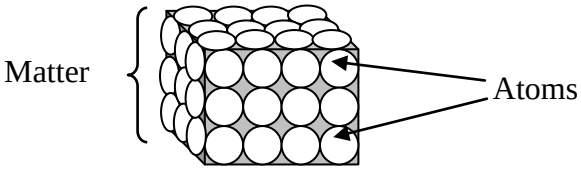
I. History

A. Greeks- "atomos" means indivisible. Believed atoms were small, solid, and indivisible. Ancient Greeks thought that a piece of a substance could be cut in half, again and again, until the smallest pieces of that substance are called atoms



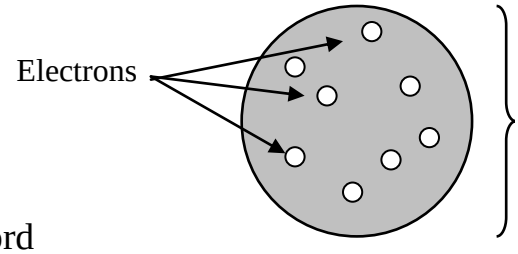
B. Dalton-1803.

1. All matter is made of atoms, which are small, dense spheres of indivisible, indestructible particles.



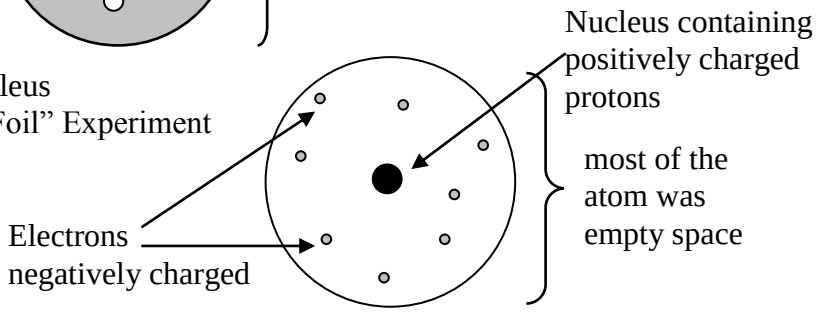
C. Thomson-1898

1. Plum pudding model.
2. Discovered and named electrons-cathode ray tube.
3. Discovered protons with other scientists.



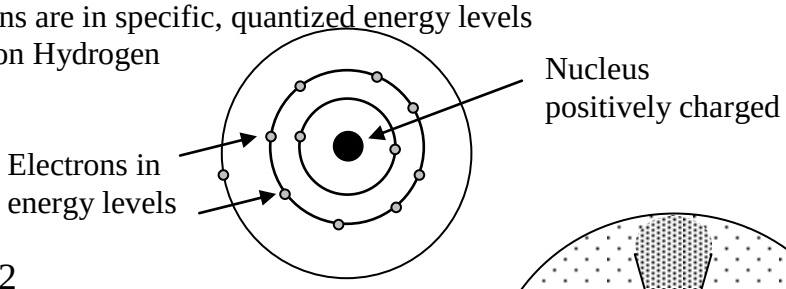
D. Rutherford

1. Discovered the Nucleus
   Completed "Gold Foil" Experiment



E. Bohr-1923

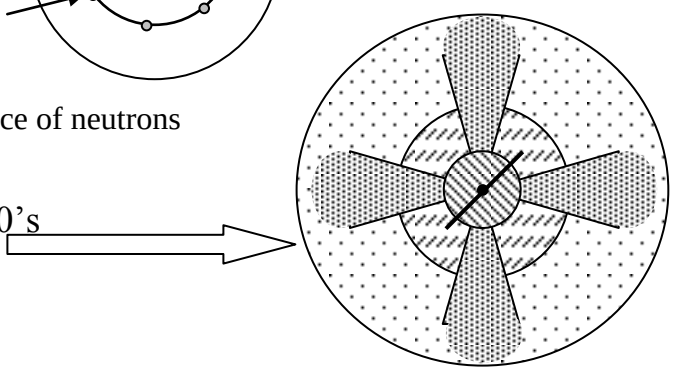
1. Father of the modern atomic theory
2. Electrons are in specific, quantized energy levels
3. Based on Hydrogen



F. Chadwick-1932

1. Confirmed the presence of neutrons in the nucleus

G. Electron Cloud Model-1940's



Particle	Mass	Charge	Location
Proton	1 amu	Positive	Nucleus
Electron	0 amu	Negative	Energy Levels
Neutron	1 amu	Neutral	Nucleus

II. The Atom

A. 3 subatomic particles:

1.
2. .
3.

B. 3 main parts of the atom

1. .
   a. Small, dense, positive, in the center
   b. contains protons and neutrons

2. .
   a. surround the nucleus
   b. contain electrons

3. .
   a. most of the atom is just space

C. Atomic Number

1. The **number of _____**in the nucleus
2. Since atoms are neutral, **the number of protons equals the number of_____**
3. The Periodic Table is arranged according to _____
4. _____ (Atomic number, protons, and electrons are all equal)

D. Atomic Mass

1. The number of _____ plus the number of _____
2. Example: Carbon (C) = 12 6 protons + 6 neutrons = 12

E. Electron placement

1. 1^{st} level holds ____ electrons
2. 2^{nd} level holds ____ electrons

Symbol	Atomic Number	Number of Protons (atomic #)	Number of neutrons (atomic mass- atomic #)	Number of Electrons (Same as protons)	Mass
	13				
Na					

III. Bohr diagrams
A. The protons and neutrons go in the nucleus
B. The electrons go in the energy levels (rings)
C. The number of rings is the same as the row on the periodic table.
D. Bohr diagram for Mg (number 12)

III. **The periodic table:** Dmitri _____- "father of the periodic table"

1. Horizontal rows (Called _____ or_____)
   A. There are many differences between elements as you go across a row.

2. Vertical Columns (Called _____)
   A. Referred to by the Roman numeral at the top, special names, or the top element.
      Example: F and Cl are in Group VII, the Halogens, and Fluorine family.
   B. They have similar properties.

3. Metals
   A. Located to the _____ of the "stair-case" line
   B. Properties
      1.
      2.
      3.
      4.

4. Non-metals
   A. Located to the _____ side of the "stair-case" line.

5. Metalloids
   A. Border the dark sides of the "stair-case" line

   B. Have properties of both_____and _____Example: semiconductors