## Lord Ernest Rutherford (1871 – 1937):

Ernest Rutherford conducted a famous experiment called the gold foil experiment. He used a thin sheet of gold foil. He also used special equipment to shoot alpha particles (positively charged particles) at the gold foil. Most particles passed straight through the foil like the foil was not there. Some particles went straight back or were deflected (went in another direction) as if they had hit something. The experiment shows:

- Atoms are made of a small positive nucleus; positive nucleus repels (pushes away) positive alpha particles
- Atoms are mostly empty space

1. What is the charge of an alpha particle? Positive
2. Why is Rutherford's experiment called the gold foil experiment? He used a thin sheet of Gold foil
3. How did he know that an atom was mostly empty space? Because it passed through easily
4. What happened to the alpha particles as they hit the gold foil? Some went Strait through and some deflected and went another direction.
5. How did he know that the nucleus was positively charged? By using special equipment

## Niels Bohr (Early 1900s):

Niels Bohr was a Danish physicist. He proposed a model of the atom that is similar to the model of the solar system. The electrons go around the nucleus like planets orbit around the sun. All electrons have their energy levels – a certain distance from the nucleus. Each energy level can hold a certain number of electrons. Level 1 can hold 2 electrons, Level 2 - 8 electrons, Level 3 - 18 electrons, and level 4 – 32 electrons. The energy of electrons goes up from level 1 to other levels. When electrons release (lose) energy they go down a level. When electrons absorb (gain) energy, they go to a higher level.

1. Why could Bohr's model be called a planetary model of the atom? Because the electrons go around the nucleus like planets orbit the sun
2. How do electrons in the same atom differ? The energy levels are different from each other
3. How many electrons can the fourth energy level hold? 32 electrons
4. Would an electron have to absorb or release energy to jump from the second energy level to the third energy level? absorb energy
5. For an electron to fall from the third energy level to the second energy level, it must lose / release energy.

lame: Ruben Date: 10/24/23 Class: 2

.1 History of the Atom Worksheet

**lohn Dalton (1766 – 1844):**

lohn Dalton was an English chemist. His ideas form the atomic theory of matter. Here are his deas.

- All elements are composed (made up) of atoms. It is impossible to divide or destroy an atom.
- All atoms of the same elements are alike. (One atom of oxygen is like another atom of oxygen.)
- Atoms of different elements are different. (An atom of oxygen is different from an atom of hydrogen.)
- Atoms of different elements combine to form a compound. These atoms have to be in definite whole number ratios. For example, water is a compound made up of 2 atoms of hydrogen and 1 atom of oxygen (a ratio of 2:1). Three atoms of hydrogen and 2 atoms of oxygen cannot combine to make water.

1. What is the name of John Dalton's theory? The Atomic Theory of matter
2. What are elements made of? There made up of Atoms
3. An atom of hydrogen and an atom of carbon are called compounds.
4. What are compounds made of? 2 atoms of Hydrogen 1 atom of oxygen.
5. The ratio of atoms in HCl is: a) 1:3 (b) 2:1 c) 1:1

**J. J. Thompson (Late 1800s):**

J. J. Thompson was an English scientist. He discovered the electron when he was experimenting with gas discharge tubes. He noticed a movement in a tube. He called the movement cathode rays. The rays moved from the negative end of the tube to the positive end. He realized that the rays were made of negatively charged particles – electrons.

1. What did J.J. Thompson discover? the electron
2. What is the charge of an electron? negative
3. What are cathode rays made of? A Movement in gas dischaarged tubes
4. Why do electrons move from the negative end of the tube to the positive end? Because the Cathode Rays push it from one side to another
5. What was Thompson working with when he discovered the cathode rays? He was working with Gas