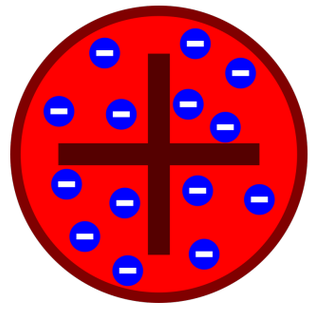
	SHS LEARNING ACTIVITY	CHEM1-03-02

Name: _____ **Score/Mark:** _____
Grade and Section: _____ **Date:** _____
Strand: ☐ **STEM** ☐ **ABM** ☐ **HUMSS** ☐ **ICT (*TVL Track*)**
Type of Activity : ☐ Concept Notes ☐ Skills: Exercise/Drill ☐ Illustration
☐ Laboratory Report ☐ Essay/Task Report ☐ Other: _____
Activity Title: 03-02.Thomson's (1897) and Rutherford's (1910) models v03
Learning Target: To describe the atom models of Thomson and Rutherford
Authors/References: Victor Sojo / Brown's Central Science; Wikipedia

Dalton thought that **atoms** were **indivisible**. However, when **J.J. Thomson** took a glass tube, pumped almost all the air out, and then connected each end of a very strong battery to the two ends of the tube, **negative particles** flew from the negative end of the battery (the "**cathode**") to the positive end (the "**anode**"). This made Thomson realize that atoms of all elements have **negative particles** that are **easy to move**. We now call these particles "**electrons**".

But no matter what Thomson did, he couldn't get any positive particles to move, so he thought that the positive part of the atom must be static (he knew there had to be a positive part because atoms are electrically neutral). He therefore imagined that atoms must be made of a big solid positive mass, with negative bits (**electrons**) embedded within, just like chocolate chips in a cookie. That's why we call this the **"plum-pudding" model**. It was very advanced for its time, but it's not entirely right.



Trying to demonstrate that his mentor Thomson was right, Ernest Rutherford shot small "alpha" particles against a very thin sheet of gold. He was expecting most particles to bounce back after smashing against the solid wall of plum-pudding atoms but, to his surprise, **most went through!** Only a few did bounce back. He concluded that the atom must be mostly empty (that's why most particles went through), with a **positive nucleus** and the **electrons around it like planets to the sun**.

Exercise: Draw Rutherford's planetary model of a Lithium atom (3 electrons). Note that in 1910 **Rutherford knew nothing of protons, neutrons or orbitals**. These were discovered later.