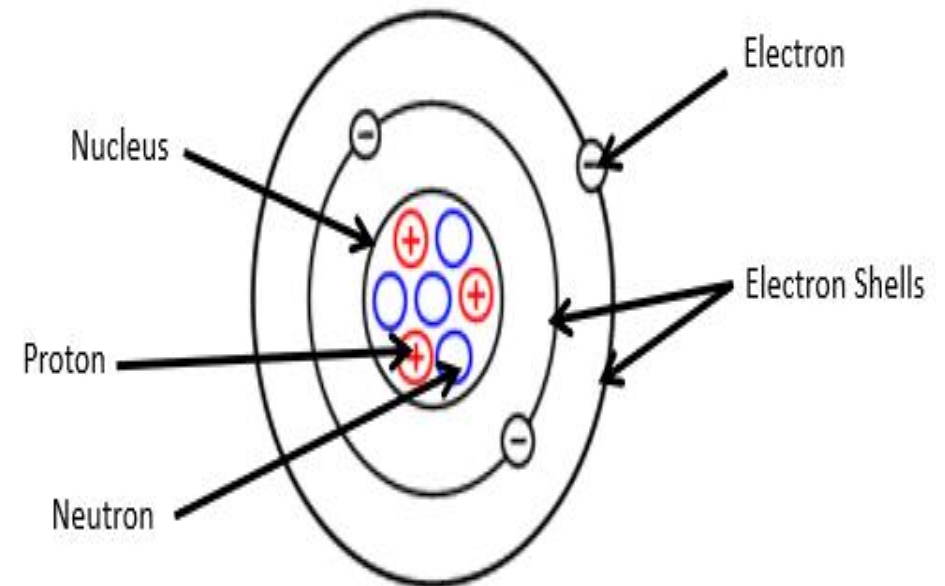


Objective:

- To be able to describe the atomic structure.
- To describe the method of discovering the nucleus.

What is an atom made of?

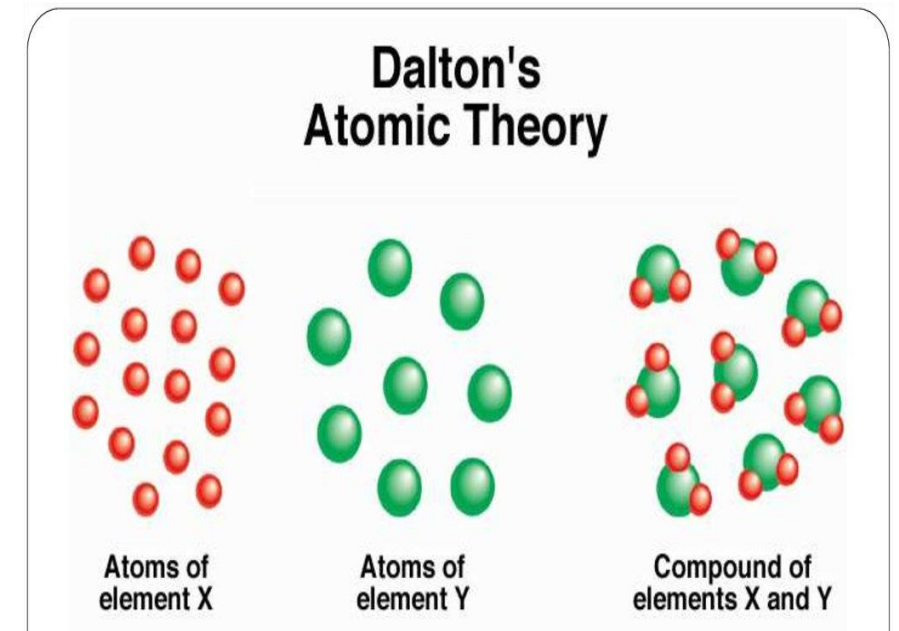
- At the centre of an atom is a positive nucleus.
- The nucleus is made up of positive protons, and neutral neutrons.
- The nucleus is surrounded by negative electrons.
- These electrons are arranged in **layers, or shells**, sometimes these shells are called **energy levels**.



The Atomic Structure

✓ Dalton's Atomic Theory

- 1) All matter is made of atoms. Atoms are indivisible.
- 2) All atoms of a given element are identical in mass and properties.
- 3) Atoms of different elements show different properties, and they have different masses and different chemical properties.
- 4) Compounds are formed by a combination of two or more different kinds of atoms.

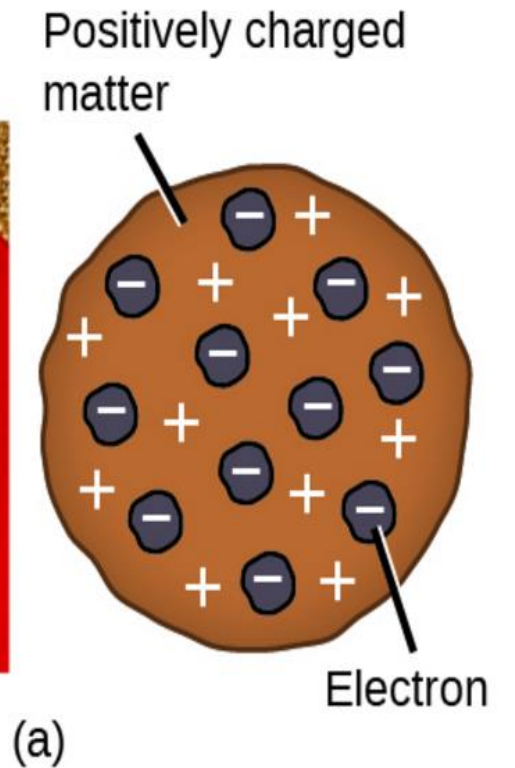


✓ Thomson's Atomic Theory

Thomson proposed a model of the atom that consisted of more than one fundamental unit.

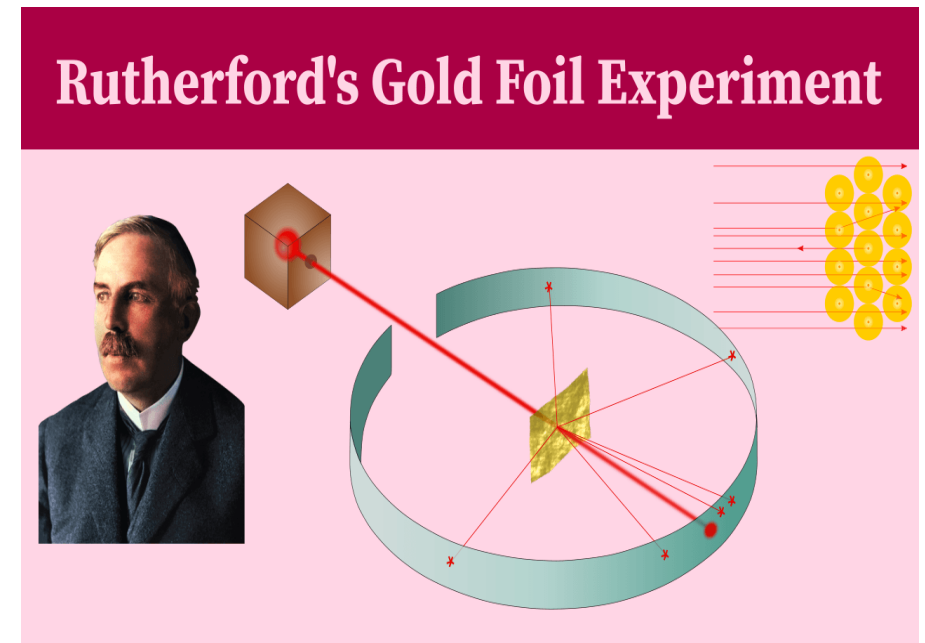
Based on its appearance, which consisted of a “sea of uniform positive charge” with electrons distributed throughout.

Thomson's model came to be nicknamed the “**Plum Pudding Model**”.



The experimental setup for Rutherford's gold foil experiment:

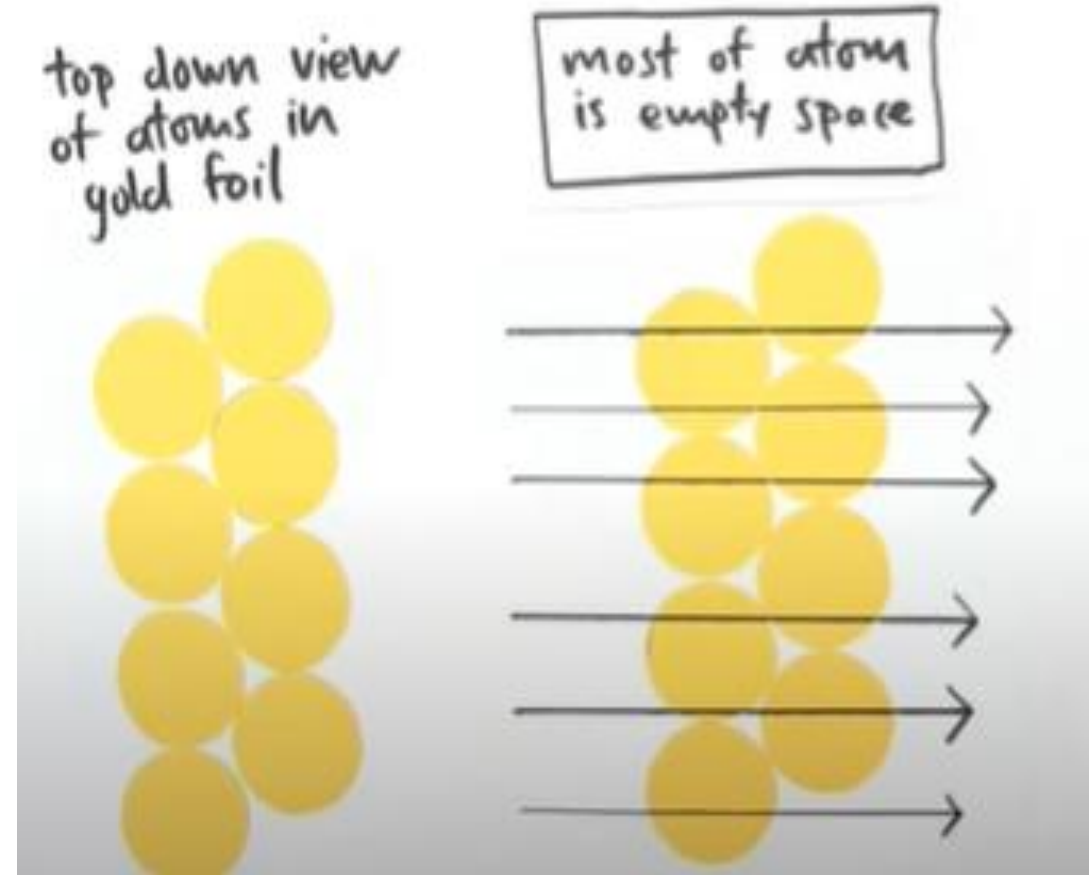
Alpha particles were directed toward a thin sheet of gold foil that was surrounded by a screen (belt) which would allow detection of the deflected particles.



https://www.youtube.com/results?search_query=discovery+of+the+nucleus

Prediction

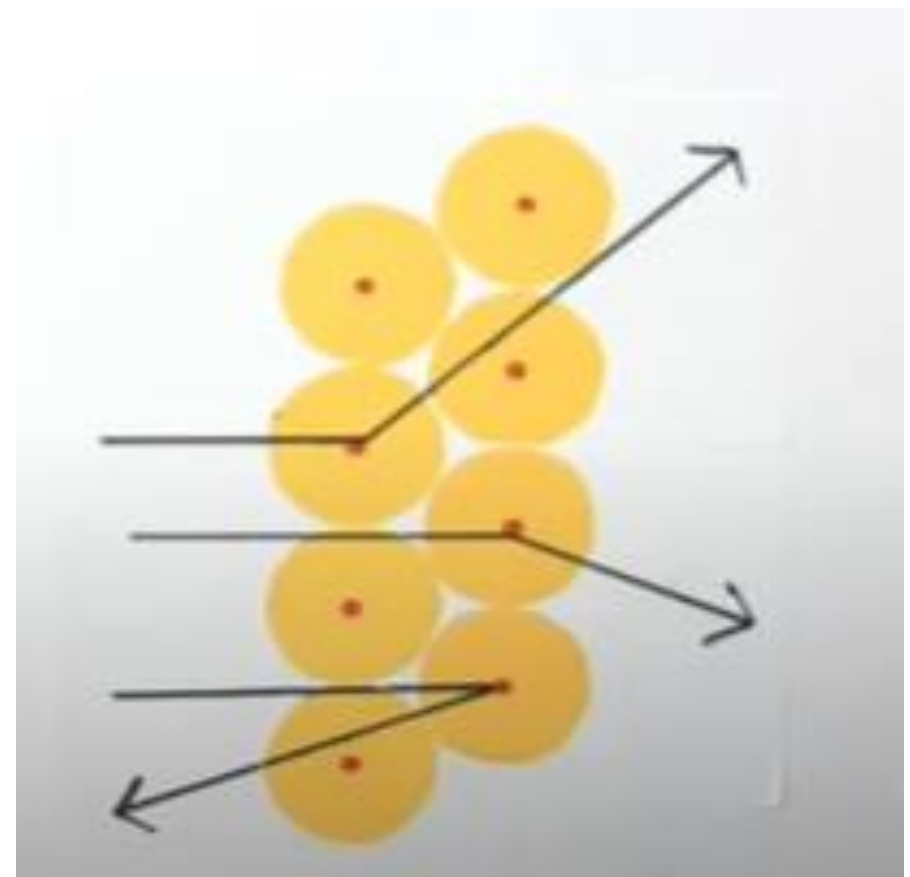
The scientists **expected** that **most** of the **alpha** particles would pass through the gold foil with only a slight deflection.



Observation

A very small percentage (about 1 in 10000 particles) **bounced off the gold foil at very large angles. Some were redirected back toward the source.**

No prior knowledge had prepared them for this discovery.

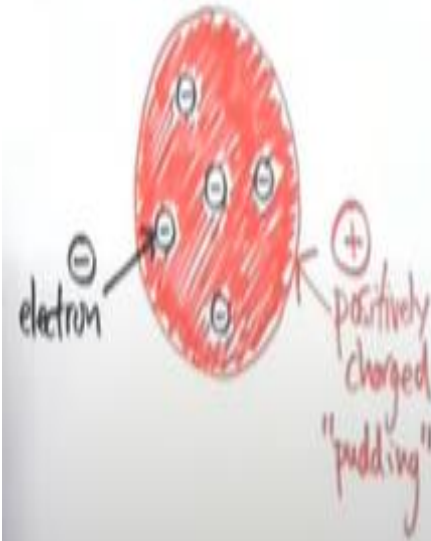


Explanation

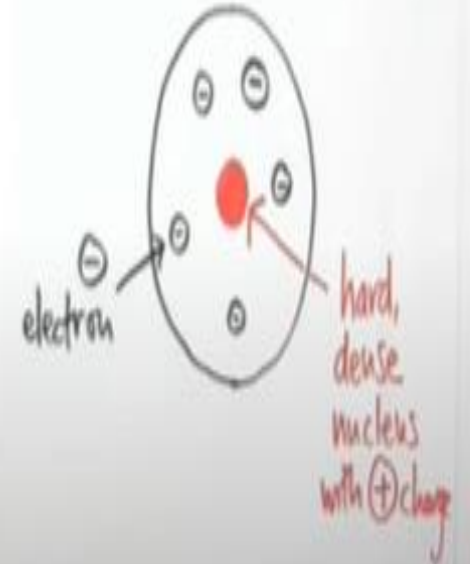
Because the majority of the alpha particles had passed through the gold, he reasoned that most of the atom was empty space.

In contrast, the particles that were highly deflected must have experienced a force within the atom. He concluded that all of the positive charge and the majority of the mass of the atom must be concentrated in a very small space in the atom's interior, which he called the nucleus.

Inside a plum-pudding atom



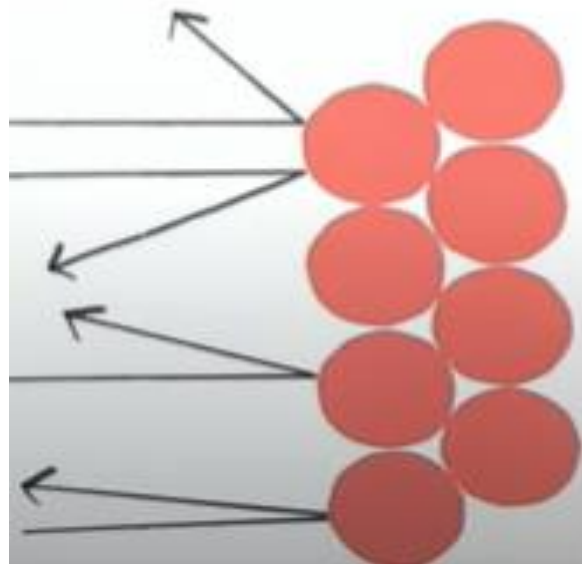
Rutherford Atom



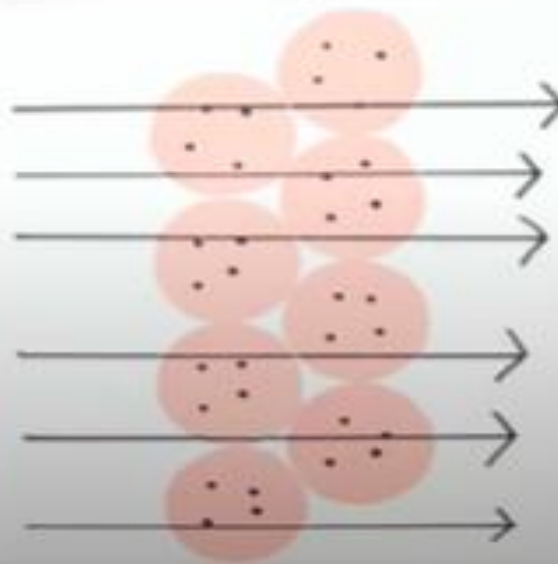
Timeline of the nuclear atom model

The nuclear model of the atom consists of a small and dense positively charged structure surrounded by a cloud of electrons.

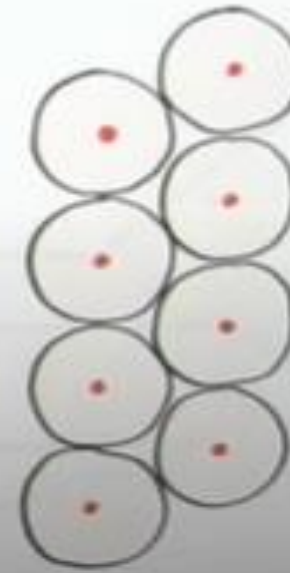
Dalton's Atomic Model



Plum-Pudding Model



Nuclear Atom Model



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Thank you