

Dalton (1766-1844)

Dalton began the development of modern atomic theory including his postulates.

(1803)

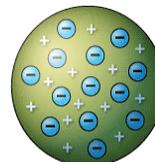
- 1) All matter is made of atoms. Atoms are indivisible and indestructible.
- 2) All atoms of a given element are identical in mass and properties
- 3) Compounds are formed by a combination of two or more different kinds of atoms.
- 4) A chemical reaction is a **rearrangement** of atoms.

Sir **Joseph John "J. J." Thomson**, (1856 – 1940)

He is credited for the discovery of the electron and of isotopes, and the invention of the mass spectrometer. Thomson was awarded the 1906 Nobel Prize in Physics for the discovery of the electron and for his work on the conduction of electricity in gases.



(1900) **Plum pudding** model was hypothesized by J.J. Thomson who described an atom as being a large positively charged body that contained small, free-floating, negatively charged particles called electrons.



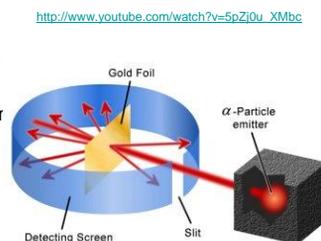
Thomson's Cathode Ray Experiments

- Look at any glowing neon sign and you are looking at the modern descendants of the cathode ray tube.
- **Do atoms have parts?** J.J. Thomson suggested that they do. He advanced the idea that cathode rays are really streams of very small pieces of atoms. Three experiments led him to this.
- Thomson built a [cathode ray tube](#) ending in a pair of metal cylinders with a slit in them. These cylinders were in turn connected to an electrometer, a device for catching and measuring electrical charge. He found that when the rays entered the slit in the cylinders, the electrometer measured a large amount of negative charge.

Rutherford (1871 – 1937) was a British chemist and physicist who became known as the father of nuclear physics.

(1910)

- Rutherford's team identified the atomic nucleus using the gold foil experiment.
- Rutherford's team later discovered the proton and neutron.



Rutherford's experiment explained

- Imagine shooting a gun at a piece of paper... what would you expect to happen?
 - How would you explain if the bullets went straight through...
 - How would you explain bullets ricocheting off to the left or right....
 - How would you explain bullets bouncing back....

Niels Bohr (1885 –1962) was a Danish physicist who made fundamental contributions to understanding **atomic structure** and quantum mechanics, for which he received the Nobel Prize in Physics in 1922.

(1913)

- Bohr developed the planetary model of the atom, Bohr model.
- The atom has a small, positively charged nucleus surrounded by electrons that travel in circular orbits around the nucleus

