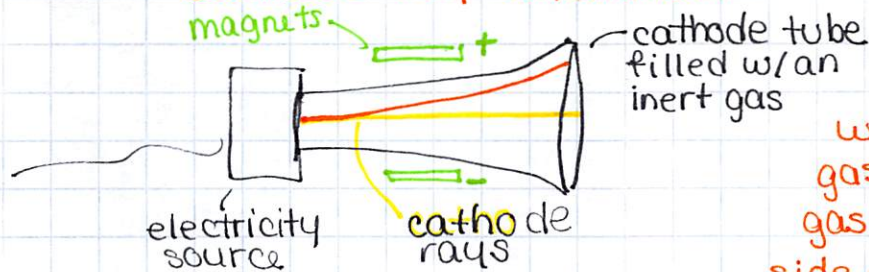


# Atomic Theory

- Democritus - 1<sup>st</sup> person to develop the idea of an atom (~3-4 Bc) atomos - indivisible
- Aristotle - disagreed w/ Democritus, believed everything is made of earth, air, water, & fire.  
(Since he was more popular, not many people believed Democritus. So the idea of atoms fell away for a while.)
- John Dalton - English school teacher, very careful (1700s) experimenter, took meticulous observations
  - Dalton's Atomic Theory
    - everything is made of atoms
    - atoms are indivisible
    - all atoms of an element are identical
    - different elements have different atoms
    - atoms form compounds w/ simple, whole-number ratios (Ex.  $H_2O$  is always made from 2 hydrogens and 1 oxygens)
  - Dalton's model of the atom

- J. J. Thomson (1800s)

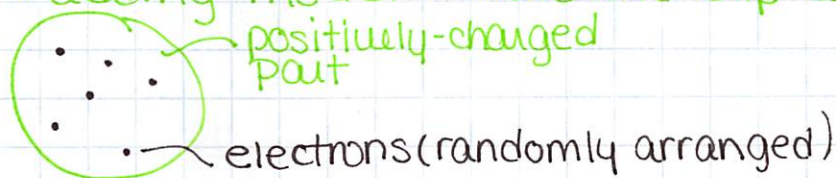
## • Cathode Ray Experiment



discovered  
electrons!  
( $e^-$ )

When the magnet was placed near the tube while electricity excited the gas, the glowing stream of gas bent toward the positive side of the magnet. Since opposites attract, Thomson believed that ~~the~~ stream of particles must be negatively charged. He called them electrons ( $e^-$ )

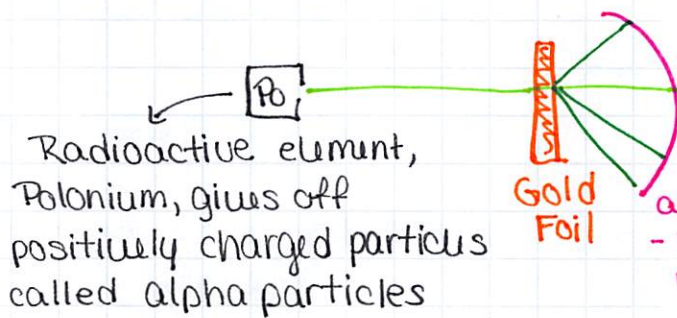
## • Plum Pudding Model (Chocolate Chip Cookie Model)





- Ernest Rutherford (1890s)

### Gold Foil Experiment

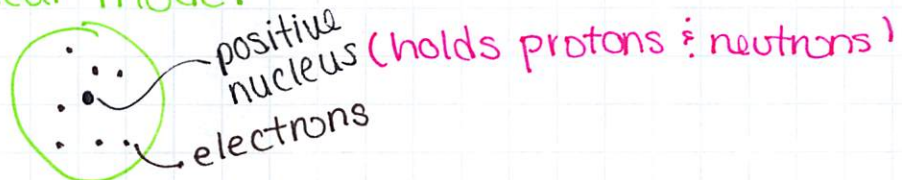


He expected alpha particles to pass straight through (lt. green line). Most did, but some bounced off something at an angle (dk. green line)

discovered the nucleus

He believed the positive alpha particles hit something positive in the atoms, called it the nucleus

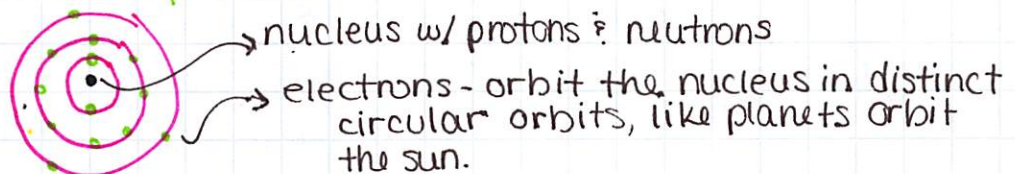
### Nuclear model



- In 1911, he discovered positively charged protons ( $p^+$ ) in the nucleus
- In 1932, he discovered neutrons ( $n^0$ ) in the nucleus w/ his graduate student, James Chadwick.

- Niels Bohr - Danish Physicist

### Planetary model



- Erwin Schrödinger

### Quantum mechanical model (current) - mathematical model

