**History of the Atom**

**Democritus** ~ 400 BC

 - Greek philosopher

 - Claimed that matter can be cut in half repeatedly until reaching the smallest possible bit of matter

 - He called this smallest particle “atomos” which meant indivisible (cannot be divided)

**Aristotle**

 - Greek philosopher

 - Had much more influence at the time than Democritus

 - Didn’t buy into the idea that Democritus proposed, so most others didn’t either.

*Neither Democritus nor Aristotle based their ideas on experimentation or observation. They were philosophers – they were just thinking and reasoning.*

*More than 2,000 years passed before people started looking into the topic of matter again and this time, the process was more experimental.*

**Dalton** - 1800s

 - Came up with the Atomic Theory (5 parts)

 1) All matter is composed of atoms

 2) Atoms cannot be created nor destroyed

 3) All atoms of the same element are identical

 4) Chemical reactions occur when atoms are rearranged

 5) Compounds are two or more different kinds of atoms

*The idea of the atom was now accepted. Now people wanted to know more about the atom.*

**Thomson**

 - Discovered the electron – negatively charged particle

 - Knew that the atom had to have a neutral charge so his model showed electrons evenly distributed throughout the atom.

**Rutherford**

 - Discovered the proton – positively charged particle

 - Found a dense area in the center of the atom, called it the nucleus

 - This dense area had a positive charge

 - Electrons circulated around the nucleus, so most of the atom must be empty space

**Bohr**

 - Electrons travel around the nucleus in energy levels (orbits)

 - Electrons could not exist between the energy levels

 - Electrons *can* move up from one level to the next if they are given enough energy

 - Quantum of energy – just enough energy to move an electron up one level

**Heisenberg**

 - Heisenberg Uncertainty Principle – it is impossible to know the speed and location of an electron (or any particle for that matter) at the same time.

**Schrodinger**

 - Since it is not possible to pinpoint the location of an electron, we can only know regions of probability of finding an electron in a given area (we call these “orbitals”)

 - Electron cloud model

**Chadwick**

 - Discovered neutron

 - In the nucleus along with protons