

# ATOM DIAGRAMS

We are able to gain a better understanding of the different elements that make up the periodic table if we first understand how atoms differ from one another. We use atom diagrams, which are essentially models that help us to actually visualize or see the difference. It is important to note that atoms don't look exactly like these models, but that the models are useful in understanding how atoms behave.

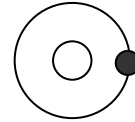
As you know all atoms are composed of protons, neutrons and electrons. Protons and neutrons are found in the nucleus of the atom. Electrons are thought to move in orbits around the nucleus. Using the periodic table we can determine the numbers of each of these subatomic particles present in an atom of a particular element.

For example, a neutral atom of hydrogen has 1 proton, 0 neutrons and 1 electron. Refer to the previous handout **WHAT'S AN ELEMENT** if you have any questions determining these things using the periodic table.

With this information we can begin to draw our model. Each atom has a positively charged nucleus that contains the protons and neutrons. We draw circles around the nucleus called **orbitals** where the electrons are thought to exist.

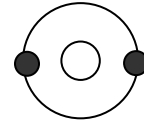
## HYDROGEN

1 proton, 0 neutrons, 1 electron



## HELIUM

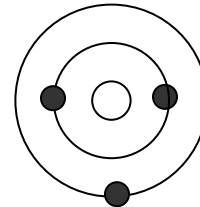
2 protons, 2 neutrons, 2 electron



Rules exist when making these models that tell us that we can only ever fit 2 electrons in the first orbital. When an atom contains more than two electrons, we must create a second orbital. The second orbital can contain a maximum of 8 electrons. After that, a third orbital must be created. For our purposes here in the middle school, we will focus only on diagramming the first 18 elements. We will not create diagrams for atoms with more than 8 electrons in the third orbital.

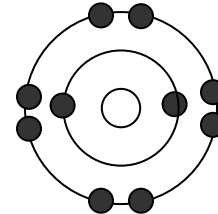
## LITHIUM

3 protons, 4 neutrons, 3 electrons



## NEON

10 protons, 10 neutrons, 10 electrons



## ARGON

18 protons, 22 neutrons, 18 electrons

