

## LESSON 1

## BASIC ELECTRON THEORY

**MATTER**

Everything you see around you is made of matter; the desk, the pen, the paper, water and even yourself. Matter is something that has mass and takes up space. It can be found in three states: solid, liquid or gas.

**ELEMENTS**

At this point you might ask, what is matter made of? **ELEMENTS**. Matter is made of elements which are substances found naturally in the universe such as carbon oxygen silver gold etc. There are around 104 naturally occurring elements in the universe.

**ATOMS**

Now, the next question is, what are elements made of? Well, each element is made up of atoms. Atoms have a central core called a nucleus filled with positively charged particles known as protons and neutrons that have no charge, positive or negative.

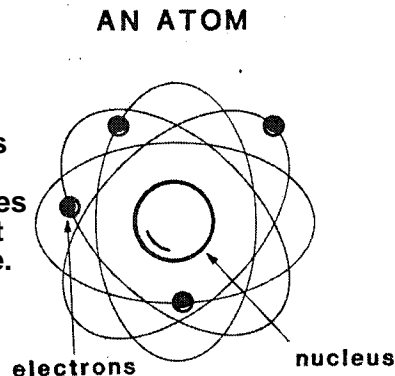


Fig. 1

Surrounding the nucleus, in several different orbits, are negatively charged particles called electrons. All atoms are so constructed regardless of whether they constitute an element of hydrogen or gold.

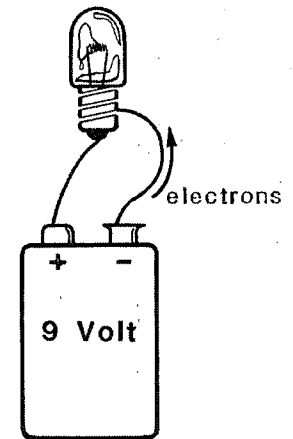
The only difference between one atom and another, is the number of protons, neutrons, and electrons that each atom has. For example, hydrogen has one proton and one electron and no neutrons while gold has 79 protons, 79 electrons and 118 neutrons.

**ELECTRONS AND ELECTRON CURRENT**

Now you can say, OK I understand everything is made up of atoms and that atoms have protons inside the nucleus with electrons in orbits running around it. But, ..., what does this have to do with electronics?

The answer to that question is, by definition, electronics is the part of physics that studies the movement of electrons called electron current. Electron current is the movement of millions and millions of electrons through a conductor, or wire.

When we connect an incandescent light bulb to a battery such as shown here, the light bulb turns on because the electrons that circulate through the filament of the bulb cause the metal filament to heat up and emit light..



This Pencil exercise is to draw a diagram of an atom and label its parts. Copy Figure #1 in the space below.

Now that you know that electronics is the part of physics that studies the movement of electrons and that electric current is the movement of millions and millions of electrons from the negative to the positive, let's go to the lesson #2 and learn about electronic components.

**Note:** To view the video lesson, got to <https://www.screencast.com/t/rj8LySH48bq> Use the QR Code to view on your cell phone.