Define Voltage, Current and Resistance

Hello/Introduction: In this video we are going to talk about voltage, current, and resistance. These are three key concepts you need to understand before going too far into the study of electricity – and robots.

Let's first review what electricity is: A very simple definition for electricity is just the flow of electrons. And electrons are the negatively charged parts of an atom that orbit outside of the atom's nucleus (or its center).

To cause electrons to flow, we need a force to "push" them along. The larger the force (or push) the more electrons flow. This force is called voltage. It's like a water blaster, if you use a small force the water does not go very far and very little water leaves the water blaster, but if you push hard, applying a larger force, then the water will go further and a lot more water leaves the water blaster in the same amount of time. Who would have thought we could use a summer toy to explain something like electricity??

As a safety note, always keep electricity and water separate!

Now we can cover another term called current. This is the measure of the amount of electrons flowing past a given point in an electrical circuit. Back to our water blaster the current is represented by the amount of water leaving the end of our water blaster.

You should start to see a connection between voltage and current? Just to state the obvious: When we increased the voltage, the current increased, and if the voltage is decreased the current decreases. So how does one limit the current for a fixed voltage level?

Let's think about a sink in your house – back to the water reference. Let the water that flows from the faucet represent the flow of electrons (or current). Now as you turn the knob on the faucet in one direction you will see an increase in the flow of water (or current). The knob is decreasing or reducing the resistance allowing more water to flow.

Turn the knob the other direction and the flow of water decreases. The knob is now increasing the resistance to the flow of water decreasing the flow of water (or for our example electricity). The sink's knob is acting like a resistor in our electric circuit. So an increase in resistance will decrease the current flow, and a decrease in resistance will increase the current flow.

Note, this assumes the voltage (or pressure in the water line for our sink example) remains constant.

Like everything in science there are units associated with these measurements. For voltage we use the unit Volts, for current the unit is amps, and for resistance we use the unit of Ohms.

Again thank you for watching and hope this was helpful. Until next time …….