THE BASICS OF ELECTRICITY | By Ally Safety

(0:07 - 0:22)

Electricity. We may not always understand it, but we sure do appreciate it. That being said, if electricity had a personality, frankly, it would be a bit of an opportunistic freeloader.

(0:22 - 0:35)

Let me explain. See this ball? It's moved by gravity. Its goal is to reach the lowest point possible, and it'll get there on its own the second I let go of it.

(0:37 - 1:32)

Electricity, on the other hand, always wants to go to ground, but not because it's low. It's because ground has a powerful positive charge, and the electrons in electricity are negative. Now, the reason that I say it's a bit of a freeloader is because it can't get there on its own.

It's going to hit your ride on whatever the easiest route may be, and that can be through you or me. That's why this course is all about preventing ourselves from becoming the path to ground. For most of us, it's been a while since we've had a basic science class, so let's do a quick review about the fundamentals of electricity.

(1:33 - 2:52)

Atoms are what everything is made of. At the centre of an atom is the nucleus, which contains a neutron and a proton. The neutron is neutrally charged, and the proton has a positive charge.

Surrounding the nucleus are orbiting electrons, which have a negative charge. Some electrons in the outermost orbit can transfer to other atoms. This movement forms the basis of electricity.

Normally, this transfer is random. However, if we apply a positive and a negative source to each side of a wire, like with this battery, the flow of electrons can be controlled. Materials that can pass electrons are called conductors.

These can be metals, like copper, or other materials. Atoms that don't have movable electrons are known as insulators, like rubber and silicone. Together, these materials help us to use electricity safely by allowing electrons to pass through the copper wiring while insulating us from also becoming conductors.

(2:54 - 3:43)

Circuits are formed when the electrons flow between the positive and negative power sources. If a source is closed, the circuit is complete, like when a light is switched on. If the circuit is open, the electrons don't have a clear path of flow and won't complete the circuit.

Pretty clear? Okay, now let's review some basic electricity terms. Think of voltage like the measure of pressure in a pipe. More voltage means there are more electrons flowing through the wire.

Current is a measure of the electron flow and is measured in amps. Remember, the current only flows when the circuit is closed. If the circuit is open, the electrons won't flow.

(3:44 - 4:26)

Resistance is pretty intuitive in that it indicates how much resistance there is to the flow of electrons in a circuit. Wires all naturally have some resistance, but the size, material, and temperature can all impact the amount of resistance. As you know, electricity works very well to power our day-to-day lives, as long as we don't accidentally become part of the circuit.

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