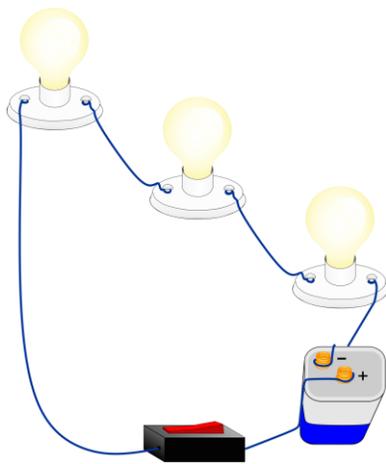


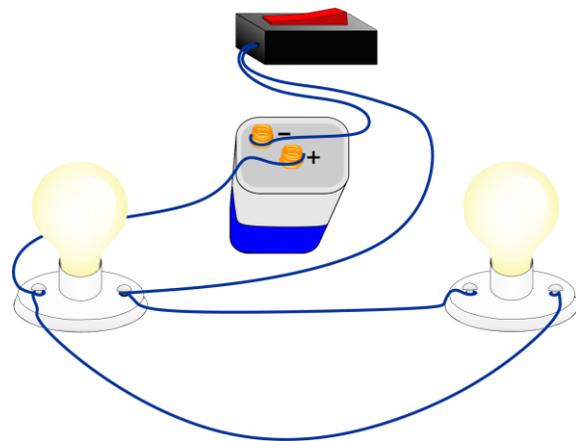
Electricity & Magnetism

Section 3: Electrical Circuits

An electrical circuit is a pathway that allows electrons to flow. In order for an electrical current to flow through the circuit, the path must have no gaps; in other words, it must be a closed circuit. There are many ways to connect devices in a circuit. A **series circuit** is a singular path connecting the light bulb to the battery. A series circuit has only one loop for a current to flow through and must flow through one element before it flows through another. In this circuit, if one light bulb goes off, they all go off. When any part of the series circuit is open, then no current can flow through the circuit. Both holiday lights and flashlights use series circuits. A **parallel circuit** connects devices with two or more branches. If one light goes out, the electrical current can travel through another branch and the rest of the lights will stay on. Homes and cars use parallel circuits. A switch is an easy way of making a break in a circuit. When it's turned on, the current flows, and when it's turned off, the circuit is broken. A **complex circuit** is composed of both series and parallel circuits.



Series Circuit



Parallel Circuit

Electrical energy enters your home at the circuit breaker or fuse box. A **circuit breaker** is a small piece of metal that bends when it gets hot, opening the circuit and stopping the current flow. When you plug in appliances, electrical devices, and lights, you are adding them to a parallel circuit. If you draw too much current, you can start an electrical fire. To prevent this from happening, homes have fuses. A **fuse** is a small piece of metal that melts if the current becomes too high, breaking the circuit.