Switch

Take a look around you. If you’re indoors, there’s most likely a wall switch nearby. Behind the wall, the switch is connected to electrical wires that lead to a light fixture. When you flip the switch to the "on" position, the light goes on. Flip the switch “off" and the light magically goes off. What's happening back there to make the light go on and off?

Materials
- A small block of wood
- Two thumbtacks
- A metal paperclip
- Two electrical wires connected to a battery with 1 1/2 inches (3.75 cm) at each end stripped bare of insulation

To Do
1. Position two thumbtacks several inches apart on a small block of wood. Push them partially into the wood, leaving only a small space between the head of the tack and the wood surface.
2. Wrap a bare end of one of the electrical wires around one of the thumbtacks. Push this tack into the wood to secure the wire.
3. Unbend a paper clip to make an S shape. Slip one end of the S under the second thumbtack. Wrap this same thumbtack with the bare end of the second wire. Push the tack into the wood to secure both the wire and the paperclip. Make sure the paper clip can reach over the first thumbtack. If not, work its shape a little more. When you press down on the paper clip, it should make contact with the head of the first thumbtack. When you release it, the clip should spring up and "open" the circuit.

The Science
The flow of electricity requires an uninterrupted path through which an electric charge can move. The charge will stop flowing if there are any breaks in the path. It doesn't matter where the break is. As long as the path is broken, no current will flow.

A switch is a device that opens and closes a circuit. In the "on" position, the switch closes the circuit and completes the route for flowing current. In the "off" position, the switch places a gap in the path, which halts the current's flow.