**Different Needs, Different Circuits**

Now that you know about the key features of an electrical circuit, you can investigate different types of circuits. In the Light Up the Class activity, you started to build electrical circuits to solve a particular problem. In the previous activity, you indentified the key features of an electrical circuit. Now, you will use your understanding of electrical circuits to build two different types of circuits, a series and a parallel circuit. ALL circuits can be classified as one of these two types.

**Safety Caution:**

* Make sure that your hands are dry when touching electrical appliances and switches.
* When wiring a parallel circuit, make sure it is disconnected from the battery to prevent shock.

**Materials:**

2 light bulbs and bulb holders

6 wires with alligator clips

9V battery

**Series Circuit**

**Procedure:**

* Connect one end of the wire to one end of the battery.
* Connect the other end of the wire to the light bulb holder.
* Using another wire, attach one end of to the other side of the light bulb holder.
* Attach one end of the wire to the battery. If the light bulb goes on, you have a series circuit!
* Disconnect one of the wires from the battery. Insert another light bulb into the series circuit.
* Use the free end of the wire to attach to the light bulb holder.
* Using another wire, attach one end to the other side of the light bulb holder and the other end to the battery.
* Now, unhook one of the light bulbs. Observe what happens.

**Circuit Check:**

A series circuit can be identified by having one loop. If you can place your finger on any part of the circuit and trace a path back to the start, you have a series circuit.

**Parallel Circuit**

**Procedure:**

* Connect one end of the wire to one end of the battery.
* At the free end of the wire, connect two other ends of wires. Check the diagram to make sure that you have attached the wires correctly.
* Connect a light bulb to one of the free ends. Use a second light bulb and connect it to the other free end.
* Repeat steps one and two with the other end of the battery. You should now have four wires connected to be connected. Two have light bulbs at the end, and two have nothing. ***Can you describe what the circuit looks like? What type of food does it look like?***
* Connect the two free ends of the wires to the two light bulbs.
* Unhook one of the light bulbs. ***Does the other light bulb stay on? Record your observations.***

**Circuit Check:**

A parallel circuit can be recognized by having more than one loop. If you can place your finger on any part of the circuit and trace a path, there will be a point where you have to choose which wire to follow.

**Follow-Up Questions:**

1. Give some examples of similarities between a series and a parallel circuit.
2. List some examples of differences between a series and a parallel circuit.
3. Why do you think the two light bulbs go out when one light bulb was unhooked in the series circuit?
4. Why do you think one light bulb stayed on when the other light bulb was unhooked in the parallel circuit?
5. Can you describe a situation where a series circuit could be used to operate an electrical device?
6. Can you describe a situation where a parallel circuit could be used to operate an electrical device?