

# Parallel and Series Circuits

## INTRODUCTION

Electricity is used in so many things it must be able to be used in a variety of ways. This experiment shows two different ways electric circuits can be set up, and how they differ.

## MATERIALS

2 batteries  
2 battery holders  
4 bulbs  
4 bulb holders  
7 alligator clips

## WHAT TO DO

1. To build the series circuit, connect an alligator clip to a battery and a bulb holder. Then use another alligator clip to connect the bulb to another bulb holder by attaching one end of the clip to one bulb and the other end of the clip to the other bulb. Use a third alligator clip to attach the second bulb to the other side of the battery.
2. With everything connected, both bulbs should light up. But if one of the alligator clips is disconnected, both bulbs go out. The same will happen if one or both of the bulbs are unscrewed.
3. To build the parallel circuit, connect an alligator clip to a battery on one end and to a bulb holder on the other end. Use another alligator clip to attach the other end of the battery to the other side of the same bulb holder. Add a second light bulb to the circuit using two more alligator clips. One of the clips should attach to one end of the first bulb and one end of the second. The other alligator clip should attach to the other sides of both bulbs.
4. With everything connected, both bulbs should light up. If one of the alligator clips is disconnected, will the bulbs still light? What if one of the bulbs is unscrewed? How many wires can be disconnected before the lights go out?

## QUESTIONS TO ASK STUDENTS

1. What is the difference between a parallel and a series circuit?
2. Why did a disconnection cause the lights to go out in the series circuit, but not in the parallel circuit?
3. Why are both types of circuits useful in our lives?

## SUMMARY

Electricity must flow in a complete circle from the source and all the way back to it. Series circuits are those in which the electricity has only one path to follow. If any part of a series circuit is disconnected, electricity cannot flow through it. Parallel circuits, however, provide more than one path for the flowing electrons to take, so if part of the circuit is disconnected, the electricity can still flow because there are other pathways available.

## SOURCES

“How Science Works” Judith Hann, The Reader’s Digest Association, Inc.: Pleasantville, New York, 1991, p. 155  
“Edison Etc.” The Wild Goose Company: Salt Lake City, Utah, 1994 p. 41-43