

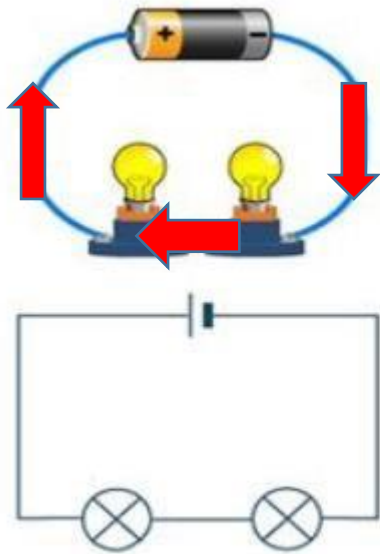
## Series and Parallel Circuits Activity

### Skill Builder ANSWER KEY

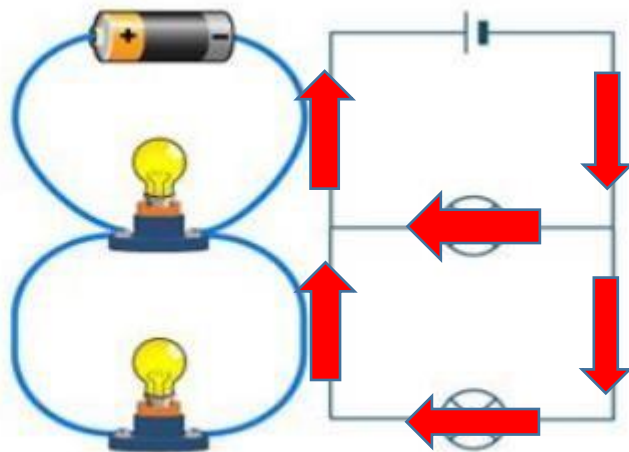
1. A **series** circuit has only one loop for the current of electrons to flow through.
2. A **parallel** circuit has two or more loops for the current of electrons to flow through.
3. When any part of a series circuit is disconnected, no current flows through the circuit. This is known as an **open** circuit.
4. What happens to the brightness of series circuit as more bulbs are added, compared to a parallel circuit with the same number of bulbs?

As bulbs are added to a series circuit the bulbs get noticeably dimmer, compared to adding more bulbs to a parallel circuit

5. Follow the path of each circuit with a colored pencil. Start the current at the power source and travel in a clockwise direction until you get back to the switch. Be sure to identify all possible pathways for the current to flow. Use the pathways you drew to answer the questions which follow.



Series Circuit



Parallel Circuit

How do these drawings help explain why all remaining bulbs go out when a series circuit loses a bulb, but the remaining bulbs in a parallel circuit keep glowing?

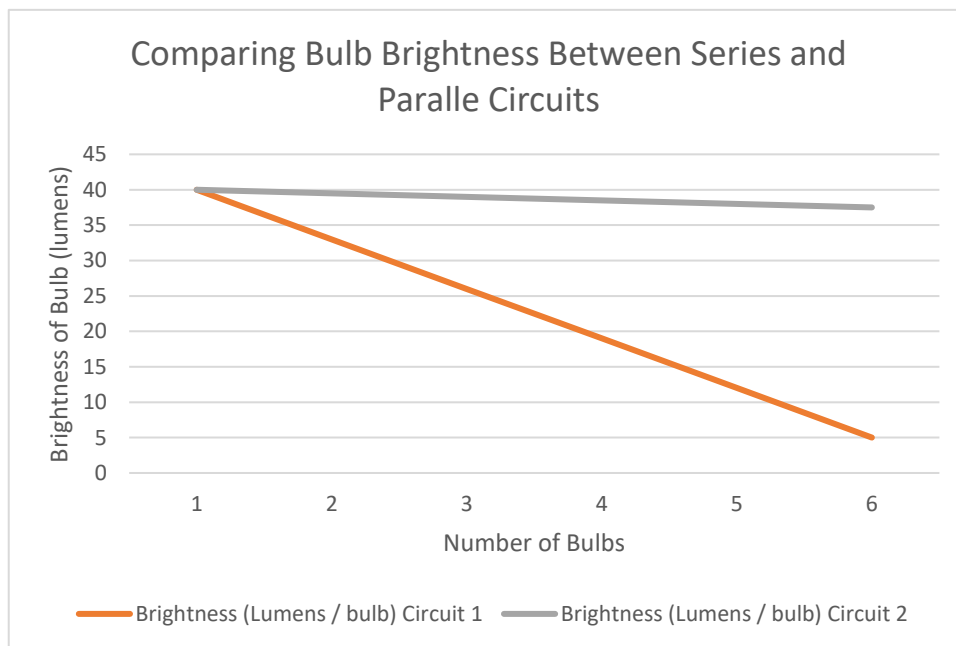
When a bulb is removed from a series circuit an open circuit is created so electrons can't continue to flow. If a bulb goes out on a parallel circuit, electrons have an alternative route to go to complete the circuit.

How do these drawings help explain why a 3-bulb parallel circuit is much brighter than a 3-bulb series circuit? Remember, there is resistance in each bulb.

Each time a current encounters a bulb in a series circuit, the resistance slows down the whole flow. When a bulb is encountered in a parallel circuit only a part of the flow is needed and additional flow can keep being supplied from the power source.

6. Use the data collected by students who measured the brightness of bulbs of two circuits as the number of bulbs was increased. Make a different colored line for each circuit. Add a title. Label each axis.

	Brightness (Lumens / bulb)	
Number of Bulbs	Circuit 1	Circuit 2
1	40	40
2	33	39.5
3	26	39
4	19	38.5
5	12	38
6	5	37.5



Which circuit is wired as a series circuit? Circuit 1

How do you know?

The brightness drops significantly as a new bulb is added.

What would happen to each line if you used bulbs which had less resistance?

In series....higher resistance bulbs glow brighter, in parallel...higher resistance bulbs flow less

7. Draw a circuit which runs from a switch on the wall and controls an outlet and an overhead light.

