A Path with More Options

At the holidays and at parties, you often see strings of hanging lights. They decorate homes and stores everywhere. Years ago, when one bulb failed, the whole string always went out. These days when one bulb goes out, the string stays lit most of the time.

That's because some of these light sets are connected up in a special way. When one bulb goes out, the others remain lit! This special way of wiring makes it much easier to identify the burned-out bulb. Otherwise, you'd be faced with testing the entire set like in the old days.

Materials
- Two "D" cells in battery holders
- Two flashlight bulbs in lamp holders
- Electrical wires with 1 1/2 inches (3.75 cm) each end stripped bare of insulation
- A switch

To Do
Assemble the circuit shown in the diagram.
Close the switch. What happens? Do both bulbs light? Is one bulb brighter than the other? In this circuit, how many different paths can the electrons flow through?
Keep the switch closed. Unscrew one of the bulbs. What happens?
Can you explain your observations?

The Science
The circuit you built is called a parallel circuit. It offers more than one path for the moving charges. This circuit had two possible paths. The current of flowing electrons split up. Half the current travelled through the nearer "arm" of the circuit. The other half travelled through the distant "arm."
This time, when a bulb was removed, the remaining bulb stayed lit. That's because the path to the untouched bulb remained intact. The electrons continued to flow along the completed circuit loop.