

## Complete a Circuit

For electric current to flow, it needs a circuit — that's a path from the negative end of a power source to the positive end. The path needs to be made of a good conductor, like copper wire. When the circuit is closed, current flows and can be made to do work — like light a lightbulb! A gap in a circuit breaks the path so the current no longer flows.

### Objective

Investigate electrical circuits and discover what kinds of things work best to carry electric current and which work best as insulators.

### Materials

- an adult helper
- a six volt battery
- a screwdriver
- aluminum foil
- a pair of wire cutters
- an eraser
- a metal stapler
- a paper clip
- a book
- a small 1.5 volt lightbulb and a base
- three pieces of insulated wire, each about a foot long
- other everyday items (chalk, wood, nails, plastic, etc.)

**Safety Notice:** All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

### Procedure

1. Strip off a little of the insulation at each end of the wires.
2. Connect one end of the first wire to one of the terminals on the battery. Then connect the other end of that wire to one side of the lightbulb's base.
3. Screw the lightbulb into the base.
4. Connect the end of the second wire to the other side of the lightbulb's base.
5. Now connect one end of the third wire to the open terminal on the battery.
6. Touch the two ends of the wires that are not connected. What happens?
7. Experiment with different items to see which materials conduct electricity. Start with a small piece of aluminum foil. Touch both open ends of the wire to the foil. What happens?

(If the lightbulb lights up, the circuit is complete and electric current is moving through the aluminum foil. This means it is a conductor.)

8. Now test other objects to see which ones make good conductors and which are good insulators. Write down your results in the data chart.

Materials that act as Conductors	Materials that act as Insulators

### Conclusions

- What is an electrical circuit?

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- Explain the difference between an open circuit and a closed circuit.

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- What do you know about conductors?

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- What do you know about insulators?

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