SCIENCE

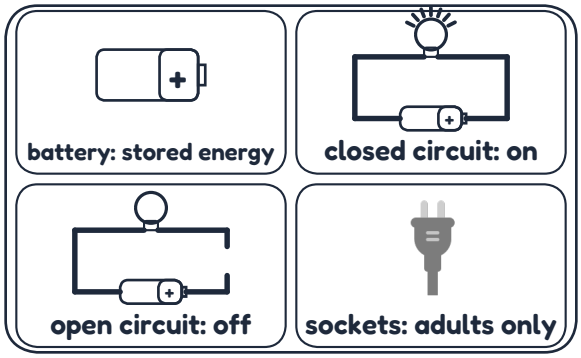
# Electricity and circuits

Name _____ Date _____

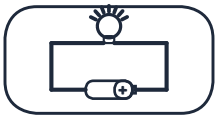
**I can build a circuit and explain why a bulb lights up.**

## 1 How it works

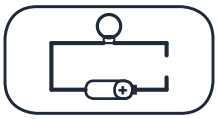
Electricity is energy that flows along a path called a circuit. A simple circuit has a battery, wires and something to power, like a bulb. The path must be closed, with no gaps, for the electricity to flow. A switch opens or closes the gap. Metals are conductors that let electricity flow; plastic, rubber and wood are insulators that stop it.



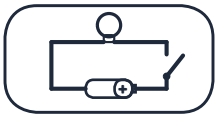

## 2 Will the bulb light? Circle one.



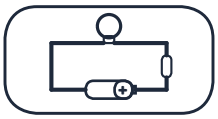
**The wires go all the way around.** lights stays off



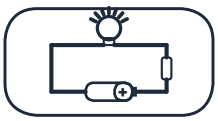
**There is a gap in one wire.** lights stays off



**The switch is open.** lights stays off



**A plastic straw fills the gap.** lights stays off



**A strip of foil fills the gap.** lights stays off

**How did I do?** ☆ ☆ ☆

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# Conductors and insulators

Name _____ Date _____

I can sort materials that do and do not carry electricity.

## 1 Electricity: conductor or insulator? Circle one.



**metal can** — conductor | insulator



**rubber boot** — conductor | insulator



**metal key** — conductor | insulator



**crayon** — conductor | insulator



**metal chain** — conductor | insulator



**yarn** — conductor | insulator



**plastic cup** — conductor | insulator



**metal spoon** — conductor | insulator

## 2 Fill in the blanks

Use the words in the box.

**socket** **conductors** **battery** **circuit**

1. Electricity flows in a closed _____.
2. A _____ stores energy for the circuit.
3. Metals are good _____.
4. Never touch a wall _____.

**How did I do?** ☆ ☆ ☆

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# Think like a scientist

Name _____ Date _____

I can explain how a circuit works and how to stay safe.

## 1 Think about it

1. Why are wires covered in plastic? _____
2. What does a switch do? _____
3. Why does a bulb go out if a wire breaks? _____
4. Where does the energy in the circuit come from? _____

## 2 True or false? Circle it.

| | | |
|---|---|---|
| 1. Electricity needs a closed circuit to flow. | true | false |
| 2. Plastic is a good conductor of electricity. | true | false |
| 3. A switch opens and closes a circuit. | true | false |
| 4. It is safe to play with wall sockets. | true | false |
| 5. Metal lets electricity flow through it. | true | false |

## 3 Draw a circuit that lights a bulb. Label the battery, the wires and the bulb.

How did I do? ☆ ☆ ☆

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# Try it: light the bulb

Name _____ Date _____

**I can build a closed circuit and test conductors.**

## 1 You need

- a 1.5-volt battery
- a small bulb in a holder
- 2 wires with clips
- a paper clip and a crayon
- an adult helper

## 2 What to do

1. Clip one wire from the battery to the bulb holder.
2. Clip the second wire from the bulb holder back to the battery. Does it light?
3. Unclip one end and touch it to a paper clip that touches the battery.
4. Try the crayon in the same spot. Does the bulb light?

## 3 I predict

Will the bulb light with the paper clip or the crayon in the gap?

_____

_____

## 4 What I see

| In the gap | Did it light? | Conductor or insulator? |
|---|---|---|
| nothing | | |
| paper clip | | |
| crayon | | |

**How did I do?** ☆ ☆ ☆

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FOR TEACHERS AND PARENTS

# Answer key: electricity and circuits

## 1 Page 1

Bulb: 1) lights; 2) stays off; 3) stays off; 4) stays off; 5) lights.

## 2 Page 2

Conductors: 1) metal can: conductor; 2) rubber boot: insulator; 3) metal key: conductor; 4) crayon: insulator; 5) metal chain: conductor; 6) yarn: insulator; 7) plastic cup: insulator; 8) metal spoon: conductor.

Blanks: 1) circuit; 2) battery; 3) conductors; 4) socket.

## 3 Page 3

Think: 1) Plastic is an insulator and keeps us safe; 2) It opens or closes the circuit; 3) The circuit is open, so electricity stops; 4) The battery.

True or false: 1) true; 2) false; 3) true; 4) false; 5) true.

Drawing: a closed loop from one end of the battery to the bulb and back to the other end, labeled.

## 4 Page 4: Try it!

With both wires clipped, the circuit is closed and the bulb lights. With a gap, it goes out. A metal paper clip in the gap lights the bulb again, because metal is a conductor. A crayon does not, because wax is an insulator, so the circuit stays open.

## 5 Teaching tip

Let children try to light the bulb with one wire before you show them two. Finding out that the path must go out of the battery and back in teaches the idea of a closed loop better than any diagram.

**Safety: use only a small 1.5-volt battery. Never use a wall socket, and never take a battery apart.**



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