

Power Path Detectives

Trace complete circuits and the energy changes they cause.

5.8.B “demonstrate that electrical energy in complete circuits can be transformed into motion, light, sound, or thermal energy and identify the requirements for a functioning electrical circuit; and”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each statement that tells a requirement for a working circuit. Circle each phrase that tells what form of energy a device makes.

Lena's Makers Fair Circuits

- ① At the school makers fair, Lena connected a battery, two wires, a switch, and a small bulb. The wires made a complete path from one battery terminal, through the switch and bulb, and back to the other terminal. When Lena closed the switch, electrical energy moved through the complete circuit. The bulb changed that electrical energy into light and a little thermal energy.
- ② Next, Lena replaced the bulb with a tiny motor that spun a paper pinwheel. In this circuit, the motor transformed electrical energy into motion. Her partner connected a buzzer in another complete circuit. The buzzer transformed electrical energy into sound. Each device needed a source of electrical energy, conducting materials such as wires, and an unbroken path. A loose wire, an open switch, or an empty battery stopped the circuit from working.
- ③ At the end of the fair, Lena tested a small heating coil that became warm. The coil changed electrical energy into thermal energy. She learned that a circuit works only when its parts are connected in a closed loop. The energy source must have usable energy, and the wires and device must make contact. Different devices can give the electrical energy different results.

2 ANSWER WITH EVIDENCE Use the passage

1 What parts made Lena's first circuit a complete path?

2 What two forms of energy did the bulb make when Lena closed the switch?

3 How did the motor and the buzzer transform electrical energy differently?

4 Why can a loose wire or an open switch stop a circuit from working?

3 YOUR TURN Your own words

Create a two-panel sketch of a complete circuit that powers a device. In panel 1, show and label an energy source, wires, a closed switch, and a device. In panel 2, show the device's output and write one sentence that names the energy transformation.

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PART 1 • READ AND MARK

Underline each statement that tells a requirement for a working circuit. Circle each phrase that tells what form of energy a device makes. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What parts made Lena's first circuit a complete path?	The battery, wires, closed switch, and bulb were connected in a path from one battery terminal back to the other terminal.
2	What two forms of energy did the bulb make when Lena closed the switch?	The bulb made light energy and a little thermal energy.
3	How did the motor and the buzzer transform electrical energy differently?	The motor transformed electrical energy into motion, spinning the pinwheel. The buzzer transformed electrical energy into sound.
4	Why can a loose wire or an open switch stop a circuit from working?	A loose wire or open switch breaks the path. The circuit is no longer a closed, unbroken loop.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: A battery, wires, a closed switch, and a motor are connected in one complete loop. Panel 2: A fan attached to the motor has spinning blades. Electrical energy changes into motion energy.

Accept equivalent descriptions of a closed, unbroken path and required connected parts. For the open task, accept any accurate complete circuit with labeled source, wires, closed switch, device, and a correct energy transformation.