

Current in Action

Trace how electricity moves, changes, and creates effects.

5.4 "The student will investigate and understand that electricity is transmitted and used in daily life. Key ideas include electricity flows easily through conductors but not insulators; electricity flows through closed circuits..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the words that name conductors or insulators. Then number the three sentences that tell how electrical energy changes into another form, so you can track how electricity travels and is used.

Maya's Electricity Investigation

- ① During a power outage, Maya uses a flashlight. Its battery provides electrical energy that drives current through metal parts and a copper wire. Copper is a conductor, so electricity flows through it easily. The plastic covering on the wire is an insulator, so electricity does not flow through it easily. When Maya clicks the switch on, it closes the path, called a circuit. The bulb lights.
- ② Later, Maya rubs a balloon on a wool sweater. Rubbing certain materials together can move electric charges from one material to another. The balloon then has static electricity. It may stick to a wall or pull small paper pieces without a closed circuit. Static electricity is a buildup of charge. It is different from the moving electric current that travels through the flashlight's closed circuit.
- ③ At school, Maya sees electrical energy change into other forms. A lamp changes electrical energy into radiant energy, or light. A toaster changes it into thermal energy, or heat. A fan changes it into mechanical energy, or motion. Her teacher also wraps wire around an iron nail and connects it to a battery. Current in the wire creates a magnetic field, so the nail can attract paper clips.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How does clicking the flashlight switch on allow the bulb to light?

2 Compare the copper wire and its plastic covering. Which is a conductor, and which is an insulator?

3 What did Maya do to generate static electricity, and what could the balloon do afterward?

4 Name the energy change for the lamp, toaster, and fan. Then state what creates a magnetic field in the nail investigation.

3 YOUR TURN _____ Your own words

Invent a battery-powered tool. In exactly three sentences, explain its closed circuit, name one conductor and one insulator, and describe an energy change or a magnetic effect it uses.

PART 1 • READ AND MARK

Underline the words that name conductors or insulators. Then number the three sentences that tell how electrical energy changes into another form, so you can track how electricity travels and is used. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How does clicking the flashlight switch on allow the bulb to light?	Clicking the switch on closes the circuit, making a complete path for current to flow to the bulb.
2	Compare the copper wire and its plastic covering. Which is a conductor, and which is an insulator?	Copper is a conductor, so electricity flows through it easily. Plastic is an insulator, so electricity does not flow through it easily.
3	What did Maya do to generate static electricity, and what could the balloon do afterward?	She rubbed a balloon on a wool sweater. The balloon could stick to a wall or pull small paper pieces.
4	Name the energy change for the lamp, toaster, and fan. Then state what creates a magnetic field in the nail investigation.	The lamp changes electrical energy to radiant energy, the toaster changes it to thermal energy, and the fan changes it to mechanical energy. Current flowing through the wire creates the magnetic field.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My battery-powered sorter has a closed circuit with a switch, copper wire, and a plastic wire cover. Copper is the conductor, and plastic is the insulator. When the switch closes, current through a coil creates a magnetic field that pulls metal caps, and a motor changes electrical energy into mechanical energy.

Accept equivalent wording for complete closed paths, conductor and insulator properties, static charge, energy transformations, and magnetic fields caused by current. For the open response, accept any realistic battery-powered design that accurately includes all required parts.