

Camp Light Lab

Trace energy changes, complete circuits, and light paths.

5.8 "Force, motion, and energy. The student knows that energy is everywhere and can be observed in cycles, patterns, and systems. The student is expected to: investigate and describe the transformation of energy in systems such as energy in a..."

NAME _____ DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each energy transformation and circle the parts needed for a closed circuit. Put a box around the sentence about light traveling straight, then write 1, 2, or 3 beside examples of reflected, refracted, or absorbed light.

A Flashlight at Camp

- ① At the campsite, Maya presses the switch on a flashlight. Inside its battery, stored chemical energy changes to electrical energy. The switch closes a complete path, so electric current moves through the wires and bulb. In the bulb, electrical energy changes mostly to light energy and some thermal energy. If the path has a gap, the current cannot travel, and the flashlight stays dark.
- ② Other devices use the same kind of path but give different results. A closed circuit needs an energy source, conducting wires, and a device that uses electrical energy. A motor changes electrical energy into motion, such as a spinning fan. A buzzer changes it into sound. A toaster's heating element changes it mainly into thermal energy. An open switch breaks the circuit.
- ③ Light from a flashlight travels in straight lines until it meets matter. A smooth mirror reflects light, sending it in a new direction. Light can refract, or bend, when it moves from air into water, making a straw in a cup look bent. Dark fabric absorbs much of the light that reaches it and may warm up. A shadow forms where an object blocks straight-traveling light from reaching a surface.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What energy changes happen in Maya's flashlight battery and bulb?

2 Name the three things a closed circuit needs. What happens if the path has a gap?

3 How does electrical energy change in a motor, a buzzer, and a toaster's heating element?

4 Describe what happens to light at a mirror, in water, and on dark fabric.

3 YOUR TURN _____ Your own words

Create a three-panel energy and light investigation. In Panel 1, sketch a complete circuit with a battery, wires, a closed switch, and a motor, then label the energy changes. In Panel 2, draw straight light rays reaching a smooth mirror and reflecting. In Panel 3, show light moving from air into water and bending, or show light being absorbed by dark fabric. Write exactly two sentences explaining your system.

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PART 1 • READ AND MARK

Underline each energy transformation and circle the parts needed for a closed circuit. Put a box around the sentence about light traveling straight, then write 1, 2, or 3 beside examples of reflected, refracted, or absorbed light. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What energy changes happen in Maya's flashlight battery and bulb?	Chemical energy in the battery changes to electrical energy. In the bulb, electrical energy changes mostly to light energy and some thermal energy.
2	Name the three things a closed circuit needs. What happens if the path has a gap?	A closed circuit needs an energy source, conducting wires, and a device that uses electrical energy. If the path has a gap, current cannot travel.
3	How does electrical energy change in a motor, a buzzer, and a toaster's heating element?	A motor changes electrical energy into motion. A buzzer changes it into sound. A toaster's heating element changes it mainly into thermal energy.
4	Describe what happens to light at a mirror, in water, and on dark fabric.	A mirror reflects light in a new direction. Light refracts, or bends, when it moves from air into water. Dark fabric absorbs much of the light and may warm up.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1 labels: battery; wires; closed switch; motor; chemical energy → electrical energy → motion Panel 2 labels: incoming light ray; smooth mirror; reflected ray Panel 3 labels: air; water; refracted ray Explanation: The closed circuit changes the battery's chemical energy to electrical energy, and the motor changes electrical energy to motion. The mirror reflects light, while water refracts light as the ray moves from air into water.

Accept equivalent descriptions of energy transformations and circuit requirements if they match the passage. For the open task, check for a closed circuit, correctly labeled energy changes, straight ray segments, and accurate reflection, refraction, or absorption.