

Lantern Energy Case

Use observations to support an energy-transformation claim.

S8P2.c "Construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline every named energy form, number each transformation in order, and circle observations that could support a claim about what the lantern transforms.

Following Energy Through a Lantern

- ① At a campsite, Maya connects a battery pack to a small LED lantern. She claims that the lantern does not create energy. Instead, energy changes form as it moves through the lantern system. The battery stores chemical energy. When its circuit is closed, chemical reactions in the battery move charges through the wires. This transformation produces electrical energy that reaches the LED. To evaluate Maya's claim, track the energy forms at each part of the system.
- ② In the LED, electrical energy is transformed mainly into light energy and thermal energy. The light leaves the lantern and reaches nearby objects. Thermal energy warms the LED and its surrounding parts. Maya observes that the lamp shines when the switch is on, and after several minutes its case feels slightly warm. These observations are evidence for two output forms. Energy transferred to the air and nearby objects does not disappear, it becomes part of the surroundings.
- ③ A strong argument connects a claim to observations and scientific ideas. For this lantern, a student could claim that chemical energy in the battery is transformed into electrical energy, then electrical energy is transformed into light and thermal energy in the LED. The closed circuit explains how electrical energy reaches the LED. The shining lamp supports the light output, while the warm case supports the thermal output. The argument also recognizes energy leaving the lantern as light or thermal transfer to its surroundings.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 State Maya's claim about energy in the lantern system.

2 Write the energy transformation sequence from the battery to the LED.

3 Name two observations that support the claim about the LED's output energy. Tell which energy form each observation supports.

4 A student says that energy is lost when light leaves the lantern. Use the passage to argue against this statement.

3 YOUR TURN _____ Your own words

Choose a device that uses energy, but do not choose a lantern, LED, or battery pack. Write a three-sentence argument that states an energy-transformation claim, explains what happens in the device, and gives an observation that supports your claim.

PART 1 • READ AND MARK

Underline every named energy form, number each transformation in order, and circle observations that could support a claim about what the lantern transforms. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	State Maya's claim about energy in the lantern system.	The lantern does not create energy. Energy changes form as it moves through the system.
2	Write the energy transformation sequence from the battery to the LED.	Chemical energy in the battery is transformed into electrical energy, then electrical energy is transformed into light energy and thermal energy in the LED.
3	Name two observations that support the claim about the LED's output energy. Tell which energy form each observation supports.	The shining lamp supports light energy output. The slightly warm case supports thermal energy output.
4	A student says that energy is lost when light leaves the lantern. Use the passage to argue against this statement.	Energy is not lost. Light and thermal energy leave the lantern and become part of the surroundings, such as the air and nearby objects.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A toaster transforms electrical energy into thermal energy in its heating elements. Electric current makes the elements hot, and thermal energy then moves to the bread. The hot elements and warm, browned bread support this claim.

Accept equivalent wording for chemical, electrical, light, and thermal energy transformations. For the open response, accept any accurate device, claim, explanation, and observation that logically supports the stated transformation.