Energy Evidence Lab

Use observations to explain how energy moves and changes.

4.3 "Plan and carry out investigations to provide evidence that energy is transferred by sound, light, heat, and electric currents. a. Construct an explanation using evidence to support the claim that heat can be produced in many ways. b..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline observations that give evidence of energy moving or changing. Circle the words that tell whether an object absorbed, reflected, or conducted energy.

Three Tests for Energy

1. Maya rubbed her palms together for 30 seconds. Her hands felt warmer than before. When she held her hands still for 30 seconds, they did not feel warmer. Rubbing changed some energy of motion into heat. She also tapped a drum. She felt its top shake and heard a sound. The shaking showed that energy moved from her hand through the drum to the air.

2. Sam filled two identical cups with the same amount of cool water. He wrapped one in black paper and one in white paper. Both started at 20 degrees Celsius and sat in sunlight for 20 minutes. Water in the black cup reached 25 degrees Celsius. Water in the white cup reached 22 degrees Celsius. The black paper absorbed more light energy, while the white paper reflected more light.

3. A teacher connected a small bulb to a battery with wires. The bulb lit and grew warm. Energy carried by an electric current changed into light and heat in the bulb. Next, a metal spoon and a wooden spoon stood in the same cup of warm water. After one minute, the metal handle felt warmer than the wooden handle. Metal conducted heat up its handle more easily than wood.

2 ANSWER WITH EVIDENCE

Use the passage

1. What did Maya observe that supports the claim that rubbing made heat? What did she observe when she tapped the drum?

2. Which cup's cover absorbed more light energy? Use the water temperatures as evidence.

3. What evidence shows that the electric current transferred energy as both light and heat?

4. Which spoon conducted heat more easily? What observation supports your claim?

3 YOUR TURN

Your own words

Plan a safe test using warm water to compare how well two objects conduct heat. Choose objects other than spoons, and tell what you would keep the same, what you would measure, and what result would support your claim.

ANSWER KEY

Energy Evidence Lab

GRADE 4 · 4.3

PART 1 · READ AND MARK

Underline observations that give evidence of energy moving or changing. Circle the words that tell whether an object absorbed, reflected, or conducted energy. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What did Maya observe that supports the claim that rubbing made heat? What did she observe when she tapped the drum?	**Her hands felt warmer after rubbing but not after holding them still. When she tapped the drum, she felt its top shake and heard a sound.**
2	Which cup's cover absorbed more light energy? Use the water temperatures as evidence.	**The black paper absorbed more light energy. Its cup's water reached 25 degrees Celsius, while the white cup's water reached 22 degrees Celsius.**
3	What evidence shows that the electric current transferred energy as both light and heat?	**The bulb lit and grew warm.**
4	Which spoon conducted heat more easily? What observation supports your claim?	**The metal spoon conducted heat more easily. Its handle felt warmer than the wooden handle after one minute in the same warm water.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would place the bottom ends of two short rods, one metal and one plastic, in a bowl of warm water. I would use rods of the same size and keep them in the water for the same amount of time. I would measure the temperature at each dry top end before and after five minutes. If the metal end warms more, that would support the claim that metal conducts heat better.

Accept different safe objects and methods if the plan keeps conditions alike, compares an observable change, and explains what result would support a claim about heat conduction.