Energy Changes in Action

Trace how energy changes form in three machines.

P.4.6A.3 "Develop models demonstrating how heat and electrical energy can be transformed into other forms of energy (e.g., motion, sound, heat, or light)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the starting form of energy in each paragraph. Circle the forms it changes into, then number those changes in order.

Nia Follows the Energy

1. On a hot day, Nia turns on a small electric fan. Electrical energy travels from an outlet to a motor inside the fan. The motor makes the blades spin, so electrical energy changes into motion energy. As the blades push air, Nia hears a soft whir. Some of the electrical energy also becomes sound energy. The fan does not make new energy from nothing.

2. At dusk, Nia switches on a desk lamp to read. Electrical energy travels through its bulb. The bulb gives off light energy, which lets Nia see the words on her page. The bulb also becomes warm, so some electrical energy changes into heat energy. A useful model can show one starting form of energy leading to more than one other form.

3. At a science museum, Nia watches a small steam engine behind a clear shield. Heat from a heater warms water in the engine until it becomes steam. The steam pushes a part called a piston, and the piston turns a wheel. In this model, heat energy changes into motion energy. The turning wheel makes a clicking sound, showing that some motion energy changes into sound energy.

2 ANSWER WITH EVIDENCE

Use the passage

1. Draw an arrow model showing the energy change that makes the fan blades spin. Label both forms of energy.

2. Draw a model showing both forms of energy that come from the lamp's electrical energy.

3. Draw an arrow model showing how heat energy leads to the steam engine's clicking sound. Include the energy form between heat and sound.

4. The fan and steam engine both make something move. Draw one arrow model for each machine to show how its starting energy becomes motion energy.

3 YOUR TURN

Your own words

Invent a device that uses electrical energy or heat energy. In the box, draw and label an arrow model showing at least two energy changes, and name the parts that make them happen. Do not use a fan, lamp, or steam engine.

ANSWER KEY

Energy Changes in Action

GRADE 4 · P.4.6A.3

PART 1 · READ AND MARK

Underline the starting form of energy in each paragraph. Circle the forms it changes into, then number those changes in order. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Draw an arrow model showing the energy change that makes the fan blades spin. Label both forms of energy.	**Electrical energy → motion energy (spinning fan blades).**
2	Draw a model showing both forms of energy that come from the lamp's electrical energy.	**Electrical energy → light energy; electrical energy → heat energy.**
3	Draw an arrow model showing how heat energy leads to the steam engine's clicking sound. Include the energy form between heat and sound.	**Heat energy → motion energy (turning wheel) → sound energy (clicking).**
4	The fan and steam engine both make something move. Draw one arrow model for each machine to show how its starting energy becomes motion energy.	**Fan: electrical energy → motion energy. Steam engine: heat energy → motion energy.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Battery electrical energy → motion energy (a motor turns a toy car's wheels) → sound energy (a wheel taps a bell).

Accept different devices if the starting energy, at least two energy changes, and labeled parts form a plausible model. Arrows should show the order of the changes.