

Energy Pathways

Trace how materials move or slow heat and electricity.

4.8.B “identify conductors and insulators of thermal and electrical energy; and”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each material that is a conductor. Circle each material that is an insulator, then write T beside examples about thermal energy and E beside examples about electrical energy.

Materials at the Snack Cart

- ① At the school snack cart, a worker sets a soup pot on a hot plate. The pot's metal bottom quickly warms, and heat moves through the metal to the soup. Metal is a thermal conductor because thermal energy moves through it easily. The worker holds the pot by its thick wooden handle. Dry wood is a thermal insulator, so it slows the movement of heat to the worker's hand.
- ② Later, the worker checks a battery-powered sign. Inside its cord, copper wire carries electrical energy from the battery to the tiny light. Copper is an electrical conductor because electric current can move through it. A plastic coating covers the wire. Plastic is an electrical insulator, which helps keep current from traveling into a person's hand. The coating must not be cracked or missing.
- ③ A conductor is useful when energy needs to travel, but an insulator is useful when energy needs to be slowed or blocked. The kind of energy matters. A metal spoon can conduct thermal energy from hot cocoa, and metal can also conduct electrical energy. A foam cup can slow thermal energy, while the rubber around a plug can insulate against electrical energy. People choose materials based on the job.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which part of the soup pot is a thermal conductor? What energy moves through it?

2 Why is the pot's handle made of dry wood?

3 Name the electrical conductor and the electrical insulator in the sign cord.

4 How do conductors and insulators have different jobs at the snack cart?

3 YOUR TURN _____ Your own words

Choose three objects or materials not named in the reading. In the table, classify each as a conductor or insulator for thermal energy and electrical energy, then write a short use or safety reason.

MATERIAL OR OBJECT	THERMAL ENERGY	ELECTRICAL ENERGY	USE OR SAFETY REASON

PART 1 • READ AND MARK

Underline each material that is a conductor. Circle each material that is an insulator, then write T beside examples about thermal energy and E beside examples about electrical energy. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which part of the soup pot is a thermal conductor? What energy moves through it?	The metal bottom is a thermal conductor. Thermal energy, or heat, moves through it.
2	Why is the pot's handle made of dry wood?	Dry wood is a thermal insulator. It slows heat from moving to the worker's hand.
3	Name the electrical conductor and the electrical insulator in the sign cord.	The copper wire is the electrical conductor. The plastic coating is the electrical insulator.
4	How do conductors and insulators have different jobs at the snack cart?	Conductors let thermal or electrical energy move where it is needed. Insulators slow or block energy to help protect a person's hand.

PART 3 • YOUR TURN (SAMPLE ANSWER)

MATERIAL OR OBJECT	THERMAL ENERGY	ELECTRICAL ENERGY	USE OR SAFETY REASON
Aluminum foil	conductor	conductor	It can move heat while cooking, but it should not touch a live electrical source.
Cotton cloth	insulator	insulator	A dry cloth can help hold a warm bowl and does not easily carry electric current.
Ceramic bowl	insulator	insulator	It slows heat moving to a person's hands and does not easily carry electric current.

Accept conductor or insulator classifications that are accurate for the usual dry form of the material. Students should identify the type of energy in each classification and give a sensible use or safety reason.