

Heat on the Move

Trace three ways thermal energy travels through Earth's system.

SC.6.E.7.1 "Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through Earth's system."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each sentence that names radiation, conduction, or convection. Write R, CD, or CV in the margin beside it to show which heat-transfer mechanism the sentence describes.

A Garden Warms Up

- ① At sunrise, sunlight crosses space and warms a dark school garden bed. The energy travels as radiation, which does not need air or direct touch. The soil absorbs more energy than a shiny metal sign nearby. Soon, the warmed ground heats the thin layer of air above it. This daily change begins because energy arrived from the Sun. Even on a cool morning, the Sun can warm objects at a distance without touching them directly.
- ② By midmorning, a student touches a metal handrail that has been in the sunlight. Heat moves from the warmer rail into the cooler hand by conduction. Conduction happens when particles transfer energy through direct contact. A cast-iron pan on a stove also conducts heat from its hot bottom to its cooler handle. Metals usually conduct heat well, while wood and plastic slow this transfer because their particles pass energy less easily from one to another.
- ③ At noon, air above the sunlit garden becomes warmer and less dense. It rises, while cooler, denser air sinks to take its place. This looping movement transfers thermal energy by convection. It occurs in liquids and gases because these materials can flow. Inside Earth, slowly moving rock in the mantle can carry heat upward in a similar way. Unlike radiation, convection needs matter that can move. Unlike conduction, it carries energy as the material moves from place to place.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What mechanism transfers energy from the Sun to the garden bed? What detail shows why this mechanism can work between the Sun and Earth?

2 The soil and the metal sign receive sunlight. Which one absorbs more energy, according to the passage?

3 A student's hand touches a warm metal handrail. Name the heat-transfer mechanism and explain how heat moves.

4 Describe the convection cycle above the garden in the correct order.

3 YOUR TURN _____ Your own words

Invent a kitchen, camp, or outdoor scene. In 3 or 4 sentences, describe one example each of radiation, conduction, and convection, and explain how heat moves in each example.

PART 1 • READ AND MARK

Underline each sentence that names radiation, conduction, or convection. Write R, CD, or CV in the margin beside it to show which heat-transfer mechanism the sentence describes. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What mechanism transfers energy from the Sun to the garden bed? What detail shows why this mechanism can work between the Sun and Earth?	Radiation transfers the energy. It can travel across space and does not need air or direct contact.
2	The soil and the metal sign receive sunlight. Which one absorbs more energy, according to the passage?	The dark school garden soil absorbs more energy than the shiny metal sign.
3	A student's hand touches a warm metal handrail. Name the heat-transfer mechanism and explain how heat moves.	Conduction. Heat moves from the warmer handrail to the cooler hand through direct contact.
4	Describe the convection cycle above the garden in the correct order.	Air above the sunlit garden warms and becomes less dense, so it rises. Cooler, denser air sinks to take its place, creating a looping movement.

PART 3 • YOUR TURN (SAMPLE ANSWER)

At a campfire, radiation warms a hiker's hands without direct contact. A metal spoon in hot soup transfers heat to the hiker's fingers by conduction. In the soup, warmer liquid rises while cooler liquid sinks, so convection moves heat through the pot.

Accept scientifically accurate original situations that correctly distinguish radiation as energy transfer without contact, conduction as transfer through direct contact, and convection as heat carried by moving liquids or gases. Wording may vary if the direction of heat transfer is correct.