Thermos Heat Clues

Connect familiar experiences to new science ideas.

5.RI.3.A "Use prior (experience) and background (content) knowledge as context for new learning."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two details about familiar experiences. Circle two new facts that those experiences help you understand.

How a Thermos Works

1. Think about carrying soup in a lunch container. If the container is thin, the soup may cool before lunch. You may also have felt heat from a mug warm your hands. These experiences show that heat can move from a warmer object to a cooler object. Engineers use this background knowledge when they design a thermos.

2. A thermos has two walls with a space between them. Much of the air is removed from this space, creating a vacuum. Because there are few particles in a vacuum, heat has less material to travel through. The inner walls are often shiny, too. Shiny surfaces reflect heat energy, which helps slow the loss of heat from a hot drink.

3. Your experience with a cold drink can help you make another connection. On a hot day, ice melts quickly in an ordinary cup because heat moves from the warmer air into the ice. A thermos slows this movement in either direction. Its vacuum and shiny walls help a cold drink stay cold, just as they help hot soup stay warm.

2 ANSWER WITH EVIDENCE

Use the passage

1. What familiar experience in paragraph 1 can help you understand why soup cools in a thin container? Explain the connection.

2. Use the idea that heat moves from warmer objects to cooler objects. How does the vacuum in a thermos help slow this movement?

3. A student knows that shiny surfaces can reflect light. How can that background knowledge help the student understand the shiny walls of a thermos?

4. Use what you know about ice melting on a hot day to explain why a thermos can help a cold drink stay cold.

3 YOUR TURN

Your own words

Choose a familiar object or event that gets warmer or cooler. In 2 or 3 sentences, describe what you already know about it and explain one new idea about heat movement that your experience could help you learn.

ANSWER KEY

Thermos Heat Clues

GRADE 5 · 5.RI.3.A

PART 1 · READ AND MARK

Underline two details about familiar experiences. Circle two new facts that those experiences help you understand. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What familiar experience in paragraph 1 can help you understand why soup cools in a thin container? Explain the connection.	**Carrying soup in a thin container that cools can show that heat moves from the warmer soup to cooler surroundings.**
2	Use the idea that heat moves from warmer objects to cooler objects. How does the vacuum in a thermos help slow this movement?	**A vacuum has few particles, so heat has less material to travel through.**
3	A student knows that shiny surfaces can reflect light. How can that background knowledge help the student understand the shiny walls of a thermos?	**It can help the student understand that shiny walls reflect heat energy and slow heat loss.**
4	Use what you know about ice melting on a hot day to explain why a thermos can help a cold drink stay cold.	**Heat moves from the warmer air toward the cold drink, and the thermos slows that movement with its vacuum and shiny walls.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I know that a metal spoon left in hot cocoa soon feels warm. This experience could help me learn that heat moves from the hot cocoa into the cooler spoon, and materials can transfer heat at different speeds.

Accept responses that clearly connect a familiar experience to a new idea about heat moving or slowing down. Students may use different everyday examples if their explanation is scientifically accurate.