

**Review and Reinforce**

# Temperature, Thermal Energy, and Heat

**Understanding Main Ideas**

Answer the following questions in the spaces provided.

1. Two glasses of water have the same thermal energy. Must they have the same temperature? Explain.

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2. Describe what is meant by absolute zero.

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3. List the three things that determine thermal energy.

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4. Compare the freezing point of water on the Celsius and the Fahrenheit temperature scales.

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5. Compare a change in temperature of  $1^{\circ}\text{C}$  to a change of  $1^{\circ}\text{F}$ .

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**Building Vocabulary**

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

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|----------------------|---|
| 6. ___ Celsius       | a. on this scale, water boils at 100 degrees  |
| 7. ___ temperature   | b. a measure of the average kinetic energy of the individual particles in an object |
| 8. ___ heat          | c. the transfer of thermal energy from a warmer object to a cooler one              |
| 9. ___ absolute zero | d. the temperature at which no more thermal energy can be removed from an object    |

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# The Transfer of Heat

**Understanding Main Ideas**

Fill in the spaces in the table below by writing whether the heat is transferred by convection, radiation, or conduction.

Heat Transfer Example	Method of Heat Transfer
An entire lake is heated by water from a hot spring at the bottom of the lake.	1.
Sunlight melts a wax crayon left outside.	2.
A burner on a stove heats the bottom of a pan.	3.
The inside frame of your front door feels cold during winter.	4.
A kite rises high above a hot, sandy beach.	5.
You feel the warm glow of a bonfire.	6.

**Building Vocabulary**

Write a definition for each of these terms on the lines below.

7. convection

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8. radiation

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9. convection current

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10. conduction

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# Thermal Properties

**Understanding Main Ideas**

Answer the following questions in the spaces provided.

1. Use your knowledge of insulators and conductors to explain why cooking pots are usually made of metal with some sort of plastic handle.

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2. Listed are the specific heats of different substances, in  $J/(kg \cdot K)$ : Air is 1,005; glass is 840; and silver is 233. Explain which of the three substances is the best insulator and why.

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3. Five kilograms of Substance A requires 500 J of energy to raise its temperature by 2 degrees. Five kilograms of Substance B requires 1,000 J of energy to raise its temperature by 2 degrees. How do the specific heats of the two substances compare?

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4. Gold has a specific heat of  $126 J/(kg \cdot K)$ . A sculptor increased the temperature of a 0.5 kg block of gold by  $10^{\circ}C$ . How much energy did the sculptor add to the gold?

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**Building Vocabulary**

On a separate sheet of paper, write a definition for each of these terms.

5. insulator
6. specific heat
7. thermal expansion
8. conductor