



**Directed Reading for
Content Mastery**

**Section 3 ■ Transferring Thermal Energy
Section 4 ■ Using Thermal Energy**

1. **Directions:** On the lines provided, explain the differences between conduction, convection, and radiation. Write your answer in complete sentences.

Directions: Fill in the blanks using the correct terms from the list below.

- | | | | |
|-------------------|------------------------|-----------------------|---------------|
| liquid | heating systems | vaporization | metals |
| conduction | stroke | radiant energy | matter |

2. Many conductors, such as silver and copper, are _____.
3. _____ is energy that travels in waves.
4. The transfer of thermal energy by convection and conduction both require _____.
5. Most _____ use fuel or electricity as a source of energy.
6. Fuel burned in a stove or a fireplace transfers thermal energy to the surrounding air by _____, convection, and radiation.
7. In a _____, particles are close together, but can move from place to place.
8. _____ occurs when a liquid changes to a gas.
9. A _____ is the movement of a piston up or down.

SECTION
3

Reinforcement

Transferring Thermal Energy

Directions: Determine whether the italicized term makes each statement true or false. If the statement is true, write **true** in the blank. If the statement is false, write in the blank the term that makes the statement true.

- _____ 1. Materials that are poor conductors are *poor* insulators.
- _____ 2. The transfer of thermal energy through matter by direct contact of its particles is *convection*.
- _____ 3. The transfer of energy in the form of electromagnetic waves is *conduction*.
- _____ 4. Solids usually conduct thermal energy *better* than liquids and gases.
- _____ 5. Air is a *poor* conductor of thermal energy.
- _____ 6. Wind and ocean currents are examples of *conduction* currents.
- _____ 7. Thermal energy is usually transferred in fluids by *radiation*.
- _____ 8. As air is heated, it expands, becomes *less* dense, and rises.
- _____ 9. Dark-colored materials absorb *less* radiant energy than light-colored materials.

Directions: Circle the object in each pair that is a better conductor of thermal energy. In the blank, explain why that object is a better conductor.

10. a silver spoon _____
a helium-filled balloon _____
11. a winter jacket _____
a tank filled with water _____
12. an aluminum pot _____
a glass of iced tea _____
13. a plastic foam cup _____
window glass _____

Section 4
Using Thermal Energy

1. Describe how a forced air system works to heat a house.
2. What is thermodynamics?
3. What is the first law of themodynamics?
4. In what two ways can the temperature of a system be increased?
5. What is the second law of thermodynamics?
6. How much of the energy in the burning fuel is converted into work in a car's engine?
7. Sketch and describe the four strokes that occur in a four-stroke automobile engine.

| | |
|--|--|
| | |
| | |

8. Create a flow chart that describes how a refrigerator works.