

**Chapter 17 The Atmosphere: Structure and Temperature**

**Section 17.2 Heating the Atmosphere**

*This section describes the three ways in which heat can be transferred. It also explains what happens to solar radiation that hits Earth’s atmosphere and surface.*

**Reading Strategy**

**Using Prior Knowledge** Before you read, write your definition for each term. After you read, write the scientific definition of each term and compare it to your original definition. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Term	Your Definition	Scientific Definition
Heat		
Temperature		

**Energy Transfer as Heat**

*Match each description with its mechanism of energy transfer.*

- | Description  | Mechanism of Energy Transfer  |
|--|-------------------------------|
| _____ 1. transfer of heat by mass movement or circulation within a substance | a. radiation<br>b. convection |
| _____ 2. transfer of heat through matter by molecular activity               | c. conduction                 |
| _____ 3. ☞ transfer of heat without requiring a medium to travel through     |                               |
| 4. Circle the letter of the act of light bouncing off an object.             |                               |
| a. absorption  |                               |
| b. scattering  |                               |
| c. reflection  |                               |
| d. radiation   |                               |

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5. Complete the chart below.

Mechanism of Energy Transfer		
Mechanism	Requires direct contact?	Requires a medium?
Conduction	yes	
Convection		
Radiation		

6. ➡ Is the following sentence true or false? All objects at any temperature emit radiant energy. \_\_\_\_\_
7. ➡ Hotter objects emit \_\_\_\_\_ total energy per unit area than colder objects do.
8. ➡ Is the following sentence true or false? The hotter a radiating body is, the longer the wavelengths of maximum radiation it will produce. \_\_\_\_\_
9. ➡ Objects that are good absorbers of radiation are also good \_\_\_\_\_ of radiation.

**What Happens to Solar Radiation?**

10. ➡ List three things that can happen when radiation strikes an object. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
11. Circle the letter of the process that produces rays that travel in all directions.
  - a. absorption
  - b. transmission
  - c. reflection
  - d. scattering
12. About \_\_\_\_\_ percent of the solar energy reaching the outer atmosphere is reflected or scattered back into space.
13. What is the greenhouse effect? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
14. Is the following sentence true or false? Another term for the greenhouse effect is global warming. \_\_\_\_\_