

# Heating the Atmosphere

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

Read *Exploring Earths Weather* pages 14-18 to answer the questions below.

**Purpose:** Understand how heat spreads throughout the Earth's atmosphere.

## Section: Heat Transfer in the Atmosphere

Energy from the sun is absorbed by the Earth and changed into heat, which is spread throughout the atmosphere in three basic ways:

1. One way the Earth's atmosphere spreads energy is through the **direct transfer of heat energy** from one substance to another, called \_\_\_\_\_.
2. Because #1 occurs, what happens to the temperature of the air particles when they come into contact with warm ground? \_\_\_\_\_
3. This process causes air temperatures near the ground to become \_\_\_\_\_ than air temperatures a few meters above the ground.
4. Another way the Earth's atmosphere spreads heat energy is through \_\_\_\_\_, which is **the transfer of heat energy in a gas or liquid (fluid)**.
5. Air that heats up near the Earth's surface becomes \_\_\_\_\_ dense and \_\_\_\_\_.
6. Cooler, (**More / Less**) <sup>circle one</sup> dense air from above \_\_\_\_\_ and is heated by the ground and begins to rise again.
7. This process of warm air rising and cool air sinking forms \_\_\_\_\_ currents.  
Most heat energy in the atmosphere is transferred this way.
8. \_\_\_\_\_ is **the transfer of heat energy through empty space**.
9. This process does not need the presence of a \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_.
10. \_\_\_\_\_ energy from the sun is \_\_\_\_\_ by the Earth and changed into \_\_\_\_\_.

## Section: Greenhouse Effect

11. The \_\_\_\_\_ effect is when \_\_\_\_\_ and other gases in the atmosphere absorb infrared rays, forming a kind of "heat blanket" around the Earth.

12. What do you think would the temperature of the Earth if there were no greenhouse effect?

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13. What does the reading say could happen to the Earth because of increased CO<sub>2</sub> produced by burning fossil fuels? \_\_\_\_\_

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### Section: Temperature Variations

14. Look at figure 1-7 on page 17. Explain what causes uneven heating on the Earth's surface.

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15. Which area of the Earth receives the most direct sunlight? \_\_\_\_\_

16. The most direct sun rays strike the Earth at what angle? \_\_\_\_\_

17. If ~~this same~~ amount of radiant energy is spread out over a larger area, ~~(less direct)~~, the result is **(less / more)** energy being transferred to the Earth's surface, and **(lower / higher)** temperatures.