

Content Vocabulary

LESSON 2

Energy Transfer in the Atmosphere

Directions: *On each line, write the term that correctly replaces the underlined words in each sentence.*

- | | | | |
|-------------------|-------------------|------------------------------|------------------|
| conduction | convection | process | radiation |
| reflect | stability | temperature inversion | |

- _____ 1. In the area of the atmosphere that is closest to Earth’s surface, the transfer of thermal energy by collisions between particles of matter occurs.

- _____ 2. About one-quarter of the Sun’s radiation does not reach Earth because clouds and small particles in the air bounce back solar waves.

- _____ 3. Visible light, ultraviolet light, and infrared radiation waves are types of electromagnetic waves that transfer thermal energy from the Sun.

- _____ 4. Close to Earth’s surface, where conduction occurs, the transfer of thermal energy by the movement of matter from one place to another can also occur.

- _____ 5. The formation of thunderstorms depends on the strength or weakness of circulating air motions of the atmosphere.

- _____ 6. A layer of cooler air near Earth’s surface is trapped by a layer of warmer air when a condition in the troposphere that involves a temperature increase with altitude occurs.

- _____ 7. The Sun’s energy reaches Earth through an ordered series of actions known as radiation.

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Lesson Outline**LESSON 2*****Energy Transfer in the Atmosphere*****A. Energy from the Sun**

1. _____ is the transfer of energy by electromagnetic waves.
2. Most of the radiation that the Sun gives off is _____.
3. _____ has shorter wavelengths than visible light and can cause sunburn and skin cancer.
4. _____ has longer waves than visible light and is felt as heat.

B. Energy on Earth

1. As the Sun's energy passes through Earth's atmosphere, about 20 percent is absorbed by _____ and _____ in the atmosphere.
2. Ozone, oxygen, and water vapor absorb _____. Water and carbon dioxide absorb infrared radiation in the _____.
3. Earth's atmosphere and the surface of Earth _____ about 30 percent of the Sun's radiation that comes toward Earth.
4. About 50 percent of the Sun's radiation that reaches Earth's atmosphere is absorbed by _____.

C. Radiation Balance

1. Earth's temperature remains stable because of the _____ between the amount of radiation coming from the Sun and the amount going out from Earth.
2. Land, trees, and the ocean absorb and emit solar radiation, mainly in the form of _____.

D. The Greenhouse Effect

1. Glass allows _____ into a greenhouse. It prevents _____ from escaping, which keeps the greenhouse warm.
2. Certain _____ in the atmosphere act like the glass in a greenhouse, warming the atmosphere.

E. Thermal Energy Transfer

1. _____ always moves from objects with high temperature to objects with lower temperature.

Lesson Outline continued

- _____ is the transfer of thermal energy by the collisions between particles of matter.
- When air heats up, it becomes less _____ and rises, transferring its energy upward.
- The transfer of thermal energy by the movement of matter from one place to another is _____.
- When water changes from one phase to another, _____ is exchanged.

F. Circulating Air

- When warm air is pushed _____, cool air _____ to fill in the empty space left by the warm air.
- Air that moves upward near mountain ranges causes _____, which form lenticular clouds.
- Circulating air affects _____ and _____ around the world.
- _____ is the property of the atmosphere that describes whether circulating air motions will be strong or weak.
- When the air is _____, circulating motions of the air are strong.
- A(n) _____ occurs in the troposphere when temperature increases as altitude decreases.
- Temperature inversions prevent air from mixing and can trap _____ close to Earth's surface.