

1. Convection is thought to be one way in which heat is transferred within and between the layers below Earth's surface. Which of the following best describes convection?

- A) The hot rock material flows upward in a cyclical motion, cools, and sinks.
- B) Differences in the chemical composition of the magma causes movement
- C) Molecules collide with one another, transferring energy as heat.
- D) Electromagnetic waves from the magma reach the surrounding rock.

Correct answer(s): A

2. Electromagnetic waves produced by the sun travel through space to Earth. What is this method of energy transfer called?

- A) convection
- B) radiation
- C) conduction
- D) insulation

Correct answer(s): B

3. Conduction results in the transfer of energy as heat. Which of the following is the best example of energy transfer by conduction?

- A) Cold ocean water sinks deep into the ocean while warm ocean water rises upward.
- B) Cold surface water is warmed by warm air directly above it.
- C) Sunlight shines on the ocean warms the surface water.
- D) Water in the shallow parts of the ocean is warmer than waters in the deeper parts of the ocean.

Correct answer(s): B

4. Convection is one way in which energy is transferred in the form of heat throughout Earth's atmosphere. Which statement below is the best example of energy transfer by convection?

- A) energy transfer from the sun to Earth
- B) energy transfer from the water in the oceans to the sand on beaches
- C) energy transfer from the surface of soil to the air molecules in contact with the soil
- D) energy transfer from lower levels of the atmosphere to higher levels of the atmosphere

Correct answer(s): D

5. Radiation is one way in which energy as heat is transferred. Which of the following is the best example of energy transfer by radiation?

- A) Rocks sitting in the sunlight become hot to the touch.
- B) Cold deep ocean water rises to the surface and is warmed by contact with surface water.
- C) Warm surface water sinks down into the cool water below.
- D) Warm air warms the ground below it by contact.

Correct answer(s): A

6. The temperature of Earth's atmosphere varies. Which of the following best describes how the air in contact with Earth's surface is warmed?

- A) Earth's surface absorbs sunlight, which warms the air above it.
- B) Human activities, including the burning of fossil fuels warms the air in contact with Earth's surface.
- C) Air is warmed by the conduction of energy as heat from Earth's surface.
- D) Air is warmed by the refraction of the electromagnetic radiation from the sun.

Correct answer(s): C

7. Energy in the form of heat is transferred through solids, liquids, and gases. How is energy as heat transferred throughout the world's oceans?
- A) Sunlight penetrates the ocean's waters, evenly distributing energy as heat from the surface to the ocean floor
 - B) Energy in the form of heat is transferred throughout the ocean by waves and surface currents.
 - C) Convection currents are driven by sunlight warming surface waters, which flow throughout the oceans, distributing energy as heat.
 - D) The warmed atmosphere transfers energy as heat to the surface waters and the energy is distributed by conduction to deeper waters.

Correct answer(s): C

8. Convection is one way in which energy as heat is transferred through the upper regions of Earth's mantle. Which of the following best describes convection in Earth's mantle?
- A) Solid rock in the lower mantle transfers energy through direct contact with the upper mantle.
 - B) Rock material in the upper mantle is warmed by contact with the warmer surface rock in the crust.
 - C) Energy in the form of electromagnetic waves from Earth's core transfers energy as heat to the mantle.
 - D) Hot, liquid rock in the upper mantle rises as cooler, denser rock sinks deeper into the mantle.

Correct answer(s): D

9. It is usually warmer near the ceiling of a room compared to the floor. This is because cold air sinks and warm air rises. Which type of energy transfer causes this type of air movement?
- A) conduction
 - B) convection
 - C) insulation
 - D) radiation

Correct answer(s): B

10. Infrared radiation from the sun passes through the atmosphere, is absorbed by Earth's surface, and reradiated by Earth's surface back into the atmosphere. Some gases in the atmosphere absorb the energy that is reradiated from Earth's surface, which results in an increase in the temperature of the atmosphere. In addition to water vapor which of the following gases best absorbs the energy that is reradiated from Earth's surface?
- A) carbon dioxide
 - B) nitrogen
 - C) hydrogen
 - D) oxygen

Correct answer(s): A

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