

Energy Review Questions

1. Evidence supports the idea that increases in carbon dioxide and methane in Earth's atmosphere are major contributors to global warming. This is based primarily on the fact that carbon dioxide and methane are excellent absorbers of

- A) gamma rays
- B) microwaves
- C) visible light
- D) infrared radiation

2. An increase in which gas in Earth's atmosphere will most significantly increase global temperatures?

- A) methane
- B) oxygen
- C) nitrogen
- D) hydrogen

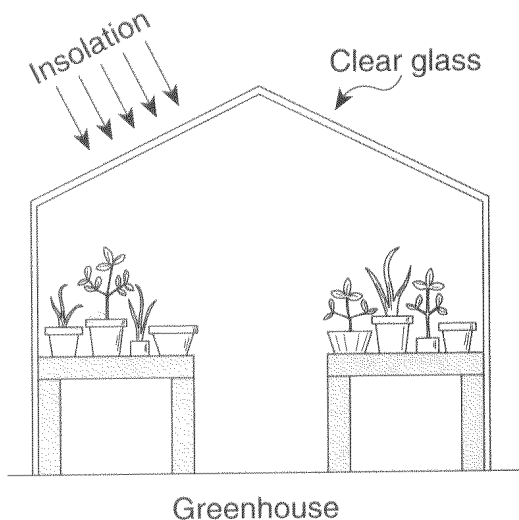
3. Deforestation increases the greenhouse effect on Earth because deforestation causes the atmosphere to contain

- A) more carbon dioxide, which absorbs infrared radiation
- B) less carbon dioxide, which absorbs short-wave radiation
- C) more oxygen, which absorbs infrared radiation
- D) less oxygen, which absorbs short-wave radiation

4. Which gas in Earth's upper atmosphere is beneficial to humans because it absorbs large amounts of ultraviolet radiation?

- A) water vapor
- B) methane
- C) nitrogen
- D) ozone

5. Base your answer to the following question on The diagram below shows a greenhouse.



What is the primary function of the clear glass of the greenhouse?

- A) The glass reduces the amount of insolation entering the greenhouse.
- B) The glass allows all wavelengths of radiation to enter and all wavelengths of radiation to escape.
- C) The glass allows short wavelengths of radiation to enter, but reduces the amount of longwavelength radiation that escapes.
- D) The glass allows long wavelengths of radiation to enter, but reduces the amount of shortwavelength radiation that escapes.

6. When Earth cools, most of the energy transferred from Earth's surface to space is transferred by the process of

- A) conduction
- B) reflection
- C) refraction
- D) radiation

7. Why are some scientists concerned about an increase in the amount of carbon dioxide in the atmosphere?

- A) An increase would change the decay rate of C^{14} .
- B) An increase would cause more ultraviolet energy to strike the Earth's outer atmosphere.
- C) An increase would cause energy to flow from energy sinks to energy sources.
- D) An increase would cause an overall heating up of the Earth's atmosphere.

8. A person in Florida worked outdoors in sunlight for several hours on a day in July. Which type of clothing should the person have worn to absorb the *least* electromagnetic radiation?

- A) dark colored with a rough surface
- B) dark colored with a smooth surface
- C) light colored with a rough surface
- D) light colored with a smooth surface

9. Changing the color of the roof of a house from light to dark would probably increase the amount of solar energy that is

- A) reflected
- B) created
- C) insulated
- D) absorbed

10. Most insolation striking a smooth, light-colored, solid surface is

- A) refracted
- B) transmitted
- C) reflected
- D) absorbed

11. Which of the following Earth surfaces usually reflects the most incoming solar radiation?

- A) snow cover
- B) green grass
- C) dark soil
- D) lake water

12. When part of the ozone layer is destroyed, radiation reaches the Earth's surface in increasing amounts. Which type of radiation increases the most?

- A) visible light
- B) ultraviolet radiation
- C) infrared radiation
- D) gamma rays

13. During nighttime cooling, most of the energy radiated by Earth's oceans into space is

- A) ultraviolet rays
- B) gamma rays
- C) visible light rays
- D) infrared rays

14. Conduction is the transfer of heat energy by

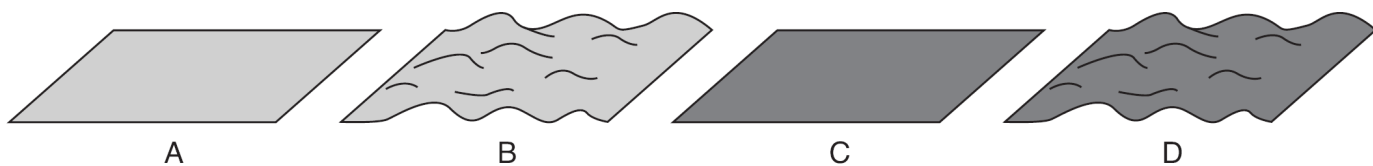
- A) density differences
- B) molecular contact
- C) electromagnetic waves
- D) movement through a vacuum

15. Most of the solar radiation absorbed by Earth's surface is later radiated back into space as which type of electromagnetic radiation?

- A) x ray
- B) ultraviolet
- C) infrared
- D) radio wave

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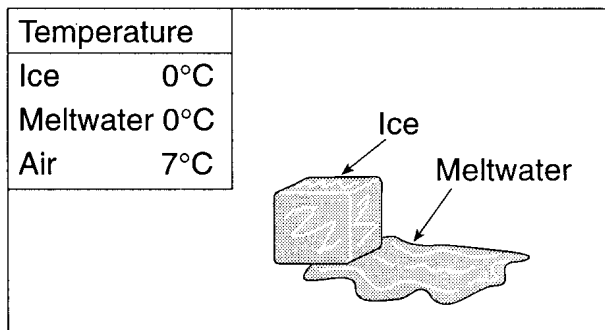
16. The diagram below shows four surfaces of equal area that absorb insolation.



Which letter represents the surface that most likely absorbs the greatest amount of insolation?

- A) A B) B C) C D) D

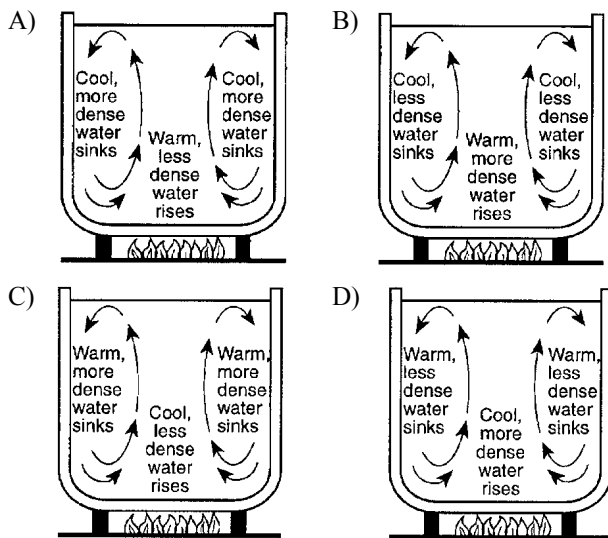
17. The diagram below shows a melting ice cube.



Which statement best describes the energy transfer?

- A) The meltwater is a heat source and the surrounding air is a heat sink.
 B) The meltwater and ice cube are both heat sources
 C) The ice cube and surrounding air are both heat sources.
 D) The ice cube is a heat sink and the surrounding air is a heat source.

18. Which diagram correctly indicates why convection currents form in water when water is heated?



19. What is the basic difference between ultraviolet, visible, and infrared radiation?

- A) half-life B) temperature
 C) wavelength D) wave velocity

20. An insulated cup contains 200 milliliters of water at 20°C. When 100 grams of ice is added to the water, heat energy will most likely flow from the

- A) water to the ice, and the temperature of the mixture will drop below 20°C
 B) water to the ice, and the temperature of the mixture will rise above 20°C
 C) ice to the water, and the temperature of the mixture will drop below 20°C
 D) ice to the water, and the temperature of the mixture will rise above 20°C

Answer Key
greenhouseQs

1. D
 2. A
 3. A
 4. D
 5. C
 6. D
 7. D
 8. D
 9. D
 10. C
 11. A
 12. B
 13. D
 14. B
 15. C
 16. D
 17. D
 18. A
 19. C
 20. A
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