

Name * Review *

1. How does the amount of heat energy reflected by a smooth, dark-colored concrete surface compare with the amount of heat energy reflected by a smooth, light-colored concrete surface?

- (1) The dark-colored surface will reflect less heat energy.
- (2) The dark-colored surface will reflect more heat energy.
- (3) The dark-colored surface will reflect the same amount of heat energy.

2. Infrared, ultraviolet, and visible light are all part of the solar spectrum. The basic difference between them is their

- (1) wavelength
- (2) speed
- (3) source
- (4) temperature

3. An object that is a good absorber of electromagnetic energy is also a good

- (1) reflector of electromagnetic energy
- (2) refractor of electromagnetic energy
- (3) radiator of electromagnetic energy
- (4) convector of electromagnetic energy

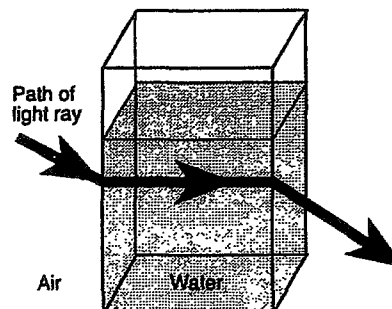
4. Which type of surface would most likely be the best reflector of electromagnetic energy?

- (1) dark-colored and rough
- (2) dark-colored and smooth
- (3) light-colored and rough
- (4) light-colored and smooth

5. Which color is the best radiator of electromagnetic energy?

- (1) red
- (2) white
- (3) black
- (4) yellow

6. The diagram below represents the path of visible light as it travels from air to water to air through a glass container of water.



The light did *not* travel in a straight line because of

- (1) convection
- (2) scattering
- (3) absorption
- (4) refraction

7. Base your answer to the following question on the *Earth Science Reference Tables*.

Compared to the wavelength of ultraviolet radiation, the wavelength of infrared radiation is

- (1) shorter
- (2) longer
- (3) the same

8. Base your answer to the following question on the *Earth Science Reference Tables*.

At which temperature would an object radiate the most electromagnetic energy?

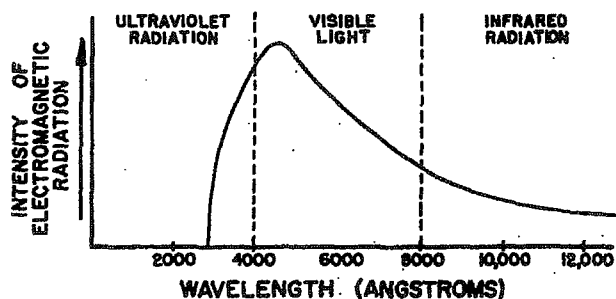
- (1) 50°C
- (2) 80°C
- (3) 310 K
- (4) 140°F

9. Which statement about electromagnetic energy is correct?

- (1) Violet light has a longer wavelength than red light.
- (2) X rays have a longer wavelength than infrared waves.
- (3) Radar waves have a shorter wavelength than ultraviolet rays.
- (4) Gamma rays have a shorter wavelength than visible light.

10. In which list are the forms of electromagnetic energy arranged in order from longest to shortest wavelengths?
- (1) gamma rays, x rays, ultraviolet rays, visible light
 - (2) radio waves, infrared rays, visible light, ultraviolet rays
 - (3) x rays, infrared rays, blue light, gamma rays
 - (4) infrared rays, radio waves, blue light, red light

11. The graph below represents the relationship between the intensity and wavelength of the Sun's electromagnetic radiation.

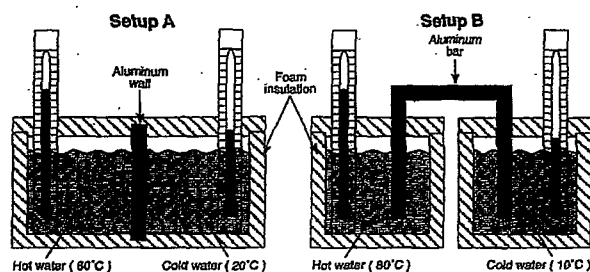


Which statement is best supported by the graph?

- (1) The infrared radiation given off by the Sun occurs at a wavelength of 2,000 angstroms.
 - (2) The maximum intensity of radiation given off by the Sun occurs in the visible region.
 - (3) The infrared radiation given off by the Sun has a shorter wavelength than ultraviolet radiation.
 - (4) The electromagnetic energy given off by the Sun consists of a single wavelength.
12. An ice cube is placed in a glass of water at room temperature. Which heat exchange occurs between the ice and the water within the first minute?
- (1) The ice cube gains heat and the water loses heat.
 - (2) The ice cube loses heat and the water gains heat.
 - (3) Both the ice cube and the water gain heat.
 - (4) Both the ice cube and the water lose heat.

13. An example of a heat sink is
- (1) a glacier on a summer day
 - (2) magma from an erupting volcano
 - (3) steam from heated ground water
 - (4) an ocean current beginning at the Equator

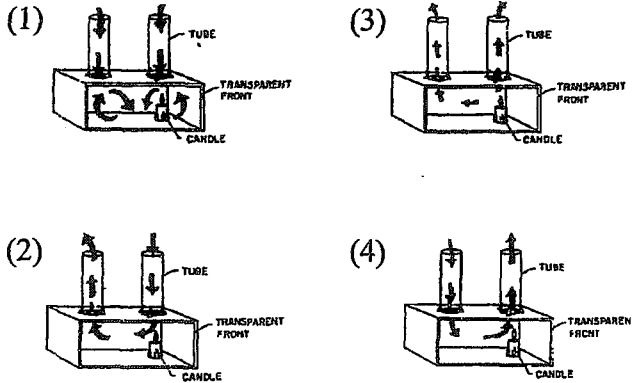
14. Base your answer on the diagrams below, which show laboratory equipment setups *A* and *B* being used to study energy transfer in a classroom laboratory.



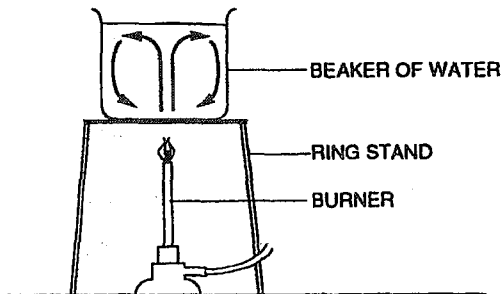
Which laboratory setup is more efficient at transferring heat energy from the hot water to the cold water?

- (1) *A*, because less energy is lost to the surrounding environment
 - (2) *A*, because the hot water has a higher temperature
 - (3) *B*, because the aluminum bar is bigger than the aluminum wall
 - (4) *B*, because the cold water has a lower temperature
15. Which statement is the best example of heat energy transfer by conduction?
- (1) Heat energy is transferred from the bottom to the top of a lake.
 - (2) Heat energy is transferred from the surface soil to the rocks below.
 - (3) Heat energy is transferred from the Earth's surface to the upper atmosphere.
 - (4) Heat energy is transferred from the Sun to the Earth.

16. The diagrams below represent a laboratory model used to demonstrate convection currents. Each model shows a burning candle in a closed box with two open tubes at the top of the box. Which diagram correctly shows the air flow caused by the burning candle?



17. The diagram below shows a container of water that is being heated.



The movement of water shown by the arrows is most likely caused by

- (1) density differences
- (2) insolation
- (3) the Coriolis effect
- (4) the Earth's rotation

18. Which form of electromagnetic energy is radiated from the Earth's surface with the greatest intensity?

- (1) x rays
- (2) infrared rays
- (3) ultraviolet rays
- (4) visible light rays

19. According to the *Earth Science Reference Tables*, which material would require the most heat energy to increase the temperature of 1 gram of the material one Celsius degree?

- (1) water
- (2) ice
- (3) basalt
- (4) granite

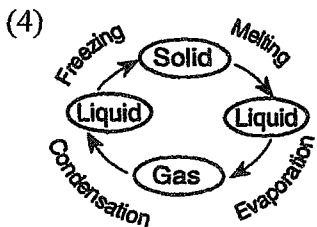
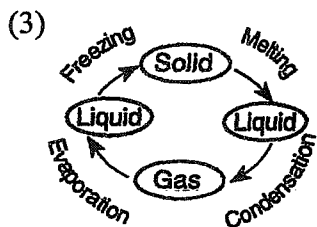
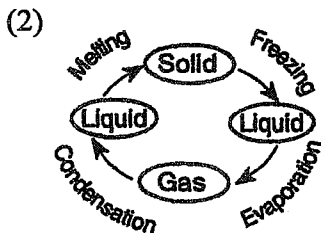
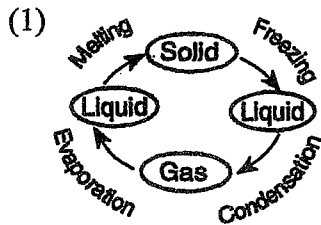
20. Which process results in a release of latent heat energy?

- (1) melting of ice
- (2) heating of liquid water
- (3) condensation of water vapor
- (4) evaporation of water

21. What energy exchange occurs when liquid water at 0°C turns to ice at 0°C?

- (1) The water loses energy.
- (2) The air around the water loses energy.
- (3) The ice gains energy.
- (4) The air and the water both gain energy.

22. Which diagram correctly shows the processes that change the states of matter?



23. Base your answer to the following question on the *Earth Science Reference Tables*.

What is the total number of calories of latent heat that must be absorbed by 1,000 grams of ice at 0°C to change all of the ice to liquid water at 0°C?

- (1) 334 Joules
- (2) 2,260 Joules
- (3) 334,000 Joules
- (4) 2,260,000 Joules

24. Land surfaces of Earth heat more rapidly than water surfaces because

- 1) more energy from the Sun falls on land than on water
- 2) land has a lower specific heat than water
- 3) sunlight penetrates to greater depths in land than in water
- 4) less of Earth's surface is covered by land than by water

25) If equal masses of water in various phases (states) are compared, which phase will contain the *greatest* amount of stored energy (latent heat)?

- 1) water vapor
- 2) liquid water
- 3) solid ice

Review Answer Key

Page 1

- 1) 1
- 2) 1
- 3) 3
- 4) 4
- 5) 3
- 6) 4
- 7) 2
- 8) 2
- 9) 4

Page 4

- 22) 4
- 23) 3 ($334 \text{ J/g} \times 1000 \text{ g}$)
- 24) 2
- 25) 1

Page 2

- 10) 2
- 11) 2
- 12) 1
- 13) 1
- 14) 1
- 15) 2

Page 3

- 16) 4
- 17) 1
- 18) 2
- 19) 1
- 20) 3
- 21) 1

