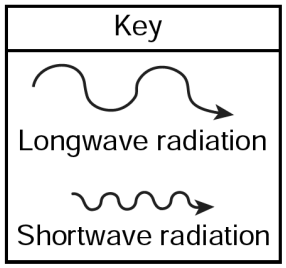
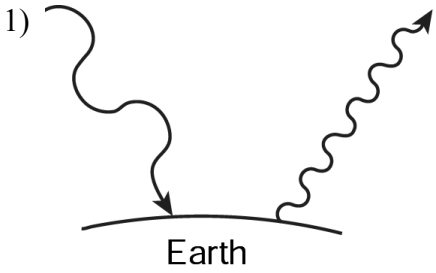
Energy in Earth Processes Review

1. Which diagram best represents the wavelength of incoming solar radiation received on Earth and the wavelength of outgoing radiation?



1)



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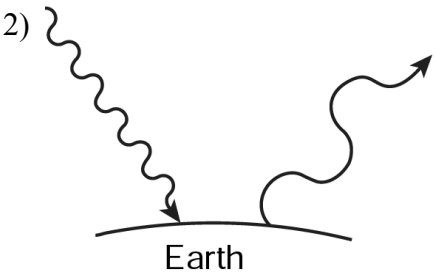

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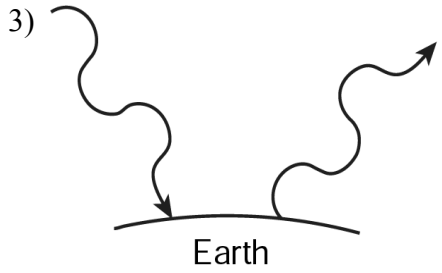

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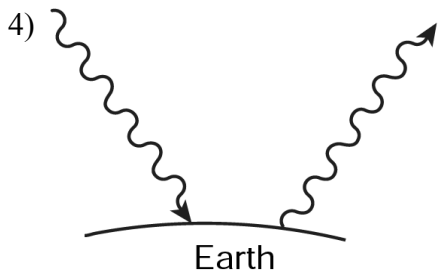


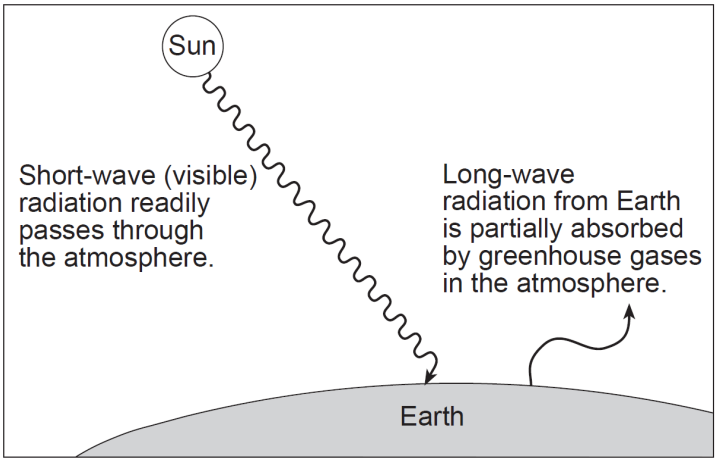
2. Which process is responsible for the greatest loss of energy from Earth's surface into space on a clear night?

   1) condensation
   2) conduction
   3) radiation
   4) convection

3. Which type of land surface will most likely absorb the greatest amount of incoming solar radiation?

   1) rough, dark-colored surface
   2) rough, light-colored surface
   3) smooth, dark-colored surface
   4) smooth, light-colored surface

4. Base your answer to the following question on the diagram below, which represents the greenhouse effect in which heat energy is trapped in Earth's atmosphere

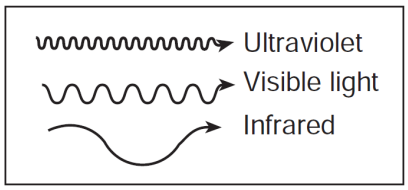


(Not drawn to scale)

Which type of radiation from Earth is the long-wave radiation absorbed by greenhouse gases?

1) ultraviolet 2) visible light 3) infrared 4) radio waves

5. Which diagram best represents the relative wave-lengths of visible light, ultraviolet energy, and infrared energy?

1)


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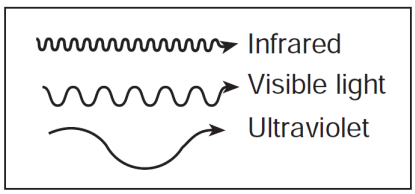

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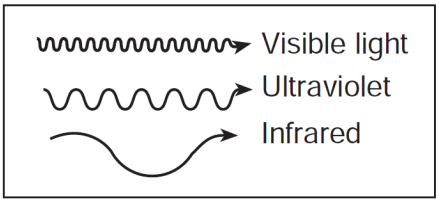

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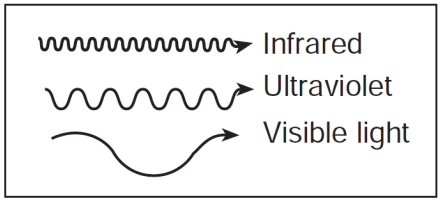
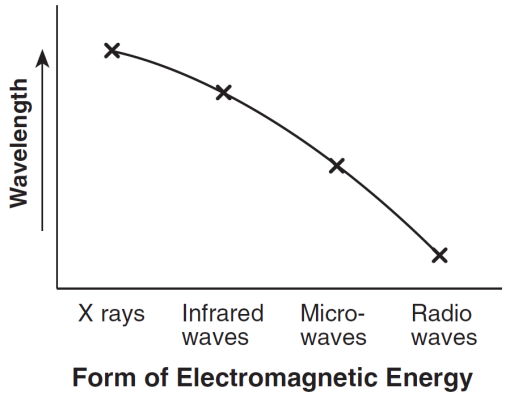


6. Which graph best represents the relative wavelengths of the different forms of electromagnetic energy?

1)



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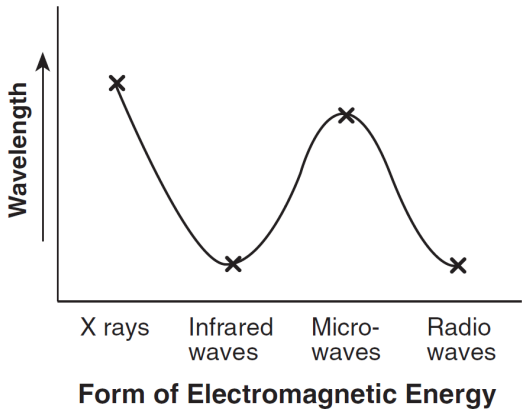

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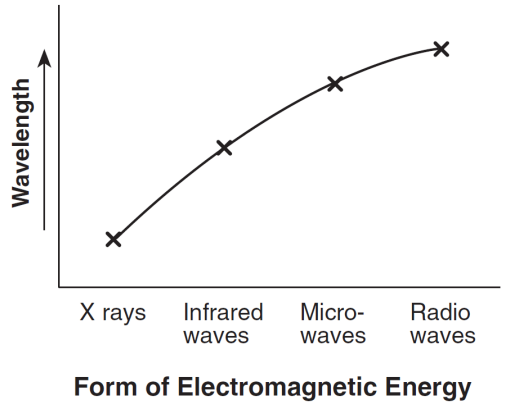

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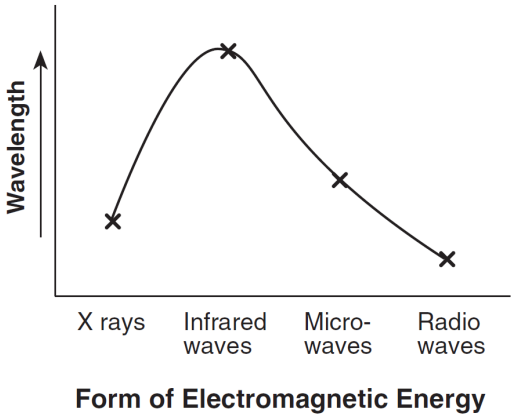


7. Energy is transferred from the Sun to Earth mainly by

1) molecular collisions
2) density currents
3) electromagnetic waves
4) red shifts

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

1) half-life
2) temperature
3) wavelength
4) wave velocity

9. Changing the shingles on the roof of a house to a lighter color will most likely reduce the amount of solar energy that is

1) scattered
2) absorbed
3) reflected
4) refracted

10. As water vapor changes phase from gas to liquid, each gram of water vapor

1) releases 2260 joules of heat energy
2) releases 334 joules of heat energy
3) gains 2260 joules of heat energy
4) gains 334 joules of heat energy

11. The picture below shows a calorimeter being used to demonstrate a method of heat transfer. One cup is filled with hot water, and the other cup is filled with cold water. A metal bar extends through the lids into the water in both cups. Thermometers record changes in temperature.

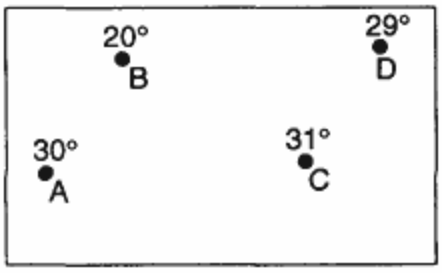
This calorimeter demonstrates the transfer of heat through the metal bar from

1) cold water to hot water by conduction
2) cold water to hot water by radiation
3) hot water to cold water by conduction
4) hot water to cold water by radiation

12. During which phase change does water release the most heat energy?

1) freezing
2) melting
3) condensation
4) vaporization

13. The map below shows four locations in a temperature field. The temperature of each location is given in degrees Celsius.



Heat energy will normally flow from

1) *A* to *B*
2) *A* to *C*
3) *B* to *D*
4) *D* to *C*

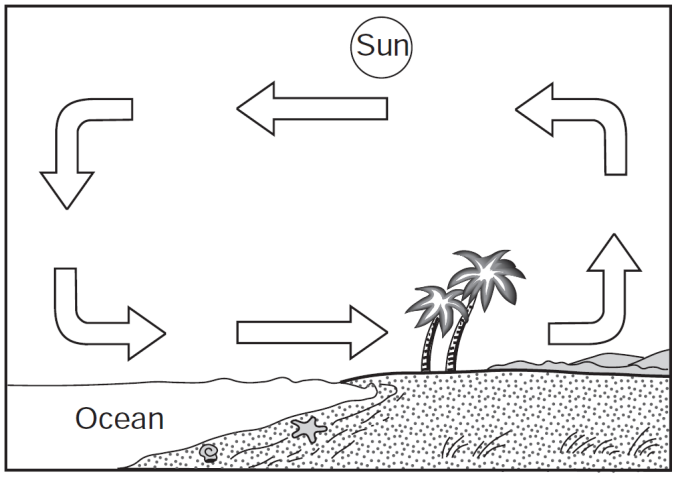
14. Pieces of lead, copper, iron, and granite, each having a mass of 1 kilogram and a temperature of 100ºC, were removed from a container of boiling water and allowed to cool under identical conditions. Which piece most likely cooled to room temperature first?

1) copper
2) lead
3) iron
4) granite

15. Which process transfers heat energy through molecular collisions?

1) radiation
2) convection
3) infiltration
4) conduction

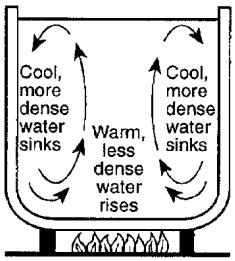
16. Arrows in the diagram below represent the daytime flow of air over a coastal region.

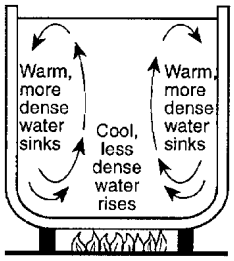


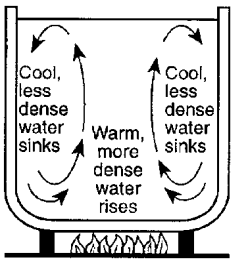
Which process primarily transfers heat by moving air?

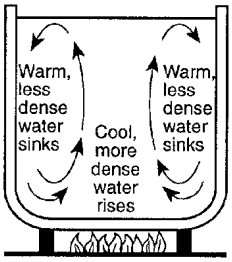
1) conduction
2) convection
3) radiation
4) transpiration

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

1) 

3) 

2) 

4) 

18. Specific heat is used to explain why different substances

1) sink or float in water
2) change temperature at different rates
3) vaporize or condense at different temperatures
4) melt and freeze at the same temperature

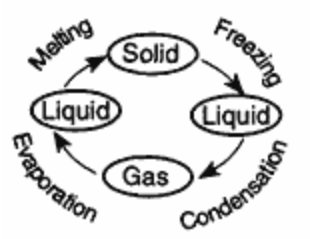
19. During which process does water gain the most heat energy?

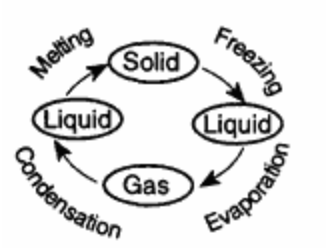
1) condensation
2) freezing
3) evaporation
4) melting

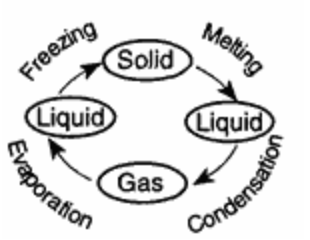
20. Land surfaces of Earth heat more rapidly than water surfaces because

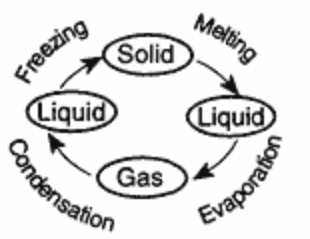
1) more energy from the Sun falls on land than on water
2) land has a lower specific heat than water
3) sunlight penetrates to greater depths in land than in water
4) less of Earth's surface is covered by land than by water

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

1) 

2) 

3) 

4) 

22. Which process requires the addition of energy to water?

1) freezing of water
2) cooling of water
3) vaporization of water
4) condensation of water

23. An air temperature of 30°C is equal to

1) –1°F 2) 68°F 3) 83°F 4) 86°F

24. A temperature of 104°F is approximately equal to

1) 220°C
2) 214°C
3) 43°C
4) 40°C

25. A temperature of 73° Fahrenheit is approximately equal to a temperature of

1) 17° Celsius
2) 23° Celsius
3) 26° Celsius
4) 162° Celsius