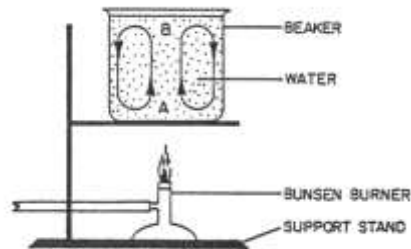


Energy and Insolation Review 3

1. Which color of the visible spectrum has the *longest* wavelength?
(1) violet (3) yellow
(2) blue (4) red
2. When 1 gram of liquid water at 0° Celsius freezes to form ice, how many total Joules of heat are lost by the water?
(1) 1 (3) 334
(2) 0.5 (4) 2260
3. Which method of energy transfer is primarily responsible for energy being lost from Earth into space?
(1) conduction (3) solidification
(2) convection (4) radiation
4. Energy is transferred from *Barnard's Star* to Earth mainly by
(1) red shifts
(2) density currents
(3) conduction
(4) electromagnetic waves

The diagram below represents a large beaker of water being heated to demonstrate convection.

5. The movement of water upward from A toward B results primarily from
(1) differences in density of the water
(2) air movement across the surface of the water
(3) capillary action within the water
(4) the shape of the beaker



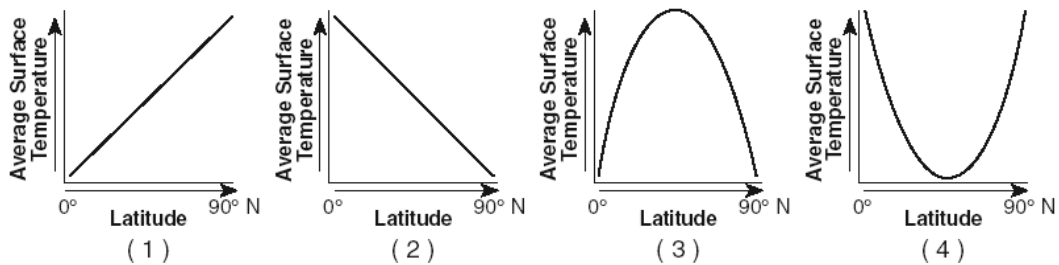
6. Which substance will heat up the quickest?
(1) 1 gram of liquid water
(2) 1 gram of iron
(3) 1 gram of basalt
(4) 1 gram of granite

7. Which change would cause a *decrease* in the amount of insolation absorbed at Earth's surface?
- (1) a decrease in cloud cover
 - (2) a decrease in atmospheric transparency
 - (3) an increase in the duration of daylight
 - (4) an increase in nitrogen gas

8. Increasing the amount of carbon dioxide in Earth's atmosphere increases atmospheric temperature because the carbon dioxide absorbs
- (1) incoming solar gamma ray radiation
 - (2) incoming solar visible light radiation
 - (3) outgoing terrestrial ultraviolet radiation
 - (4) outgoing terrestrial infrared radiation

9. In New York State, summer is warmer than winter because in summer New York State has
- (1) fewer hours of daylight and receives low-angle insolation
 - (2) fewer hours of daylight and receives high-angle insolation
 - (3) more hours of daylight and receives low-angle insolation
 - (4) more hours of daylight and receives high-angle insolation

10. Which graph best represents the general relationship between latitude and average surface temperature?

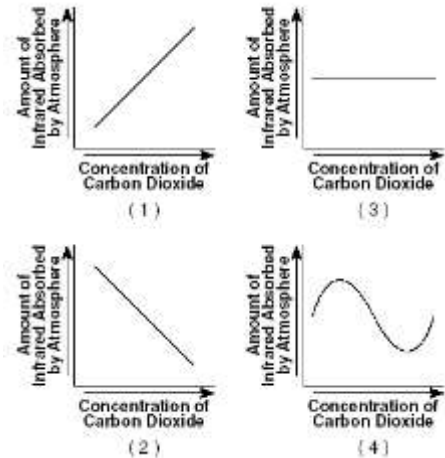


11. Most insolation striking a smooth, light-colored, solid surface is
- (1) refracted
 - (2) transmitted
 - (3) reflected
 - (4) absorbed

12. Very cold climates occur at Earth's North and South Poles because the polar regions
- (1) are usually farthest from the Sun
 - (2) receive low-angle insolation
 - (3) absorb the greatest amount of insolation
 - (4) receive the most hours of daylight

13. Most of the solar radiation absorbed by Earth's surface is later radiated back into space as which type of electromagnetic radiation?
- (1) x ray
 (2) ultraviolet
 (3) infrared
 (4) radio wave

14. Which graph best shows the relationship between the concentration of carbon dioxide in Earth's atmosphere and the amount of infrared radiation absorbed by the atmosphere?

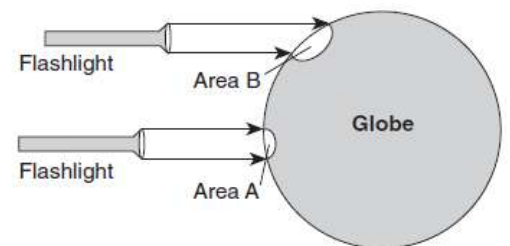


15. For weeks after a series of major volcanic eruptions, Earth's surface air temperatures are often
- (1) warmer because ash and dust decrease atmospheric transparency
 (2) warmer because ash and dust increase atmospheric transparency
 (3) cooler because ash and dust decrease atmospheric transparency
 (4) cooler because ash and dust increase atmospheric transparency

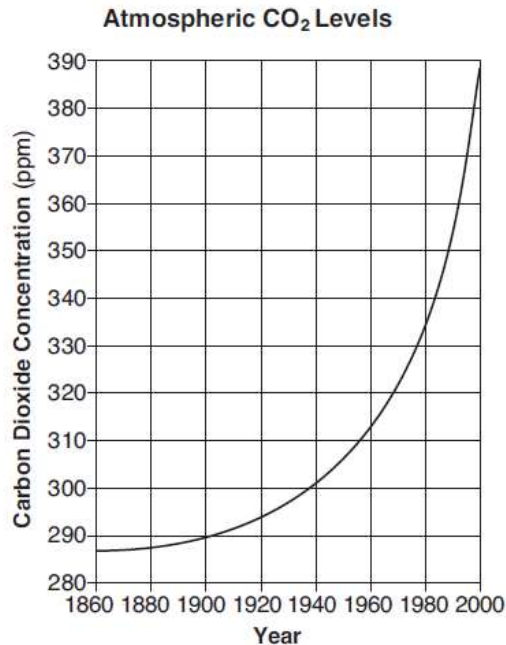
16. The diagram below shows a classroom demonstration. Two identical flashlights were placed in the positions shown and they illuminated areas of varying size, *A* and *B*, on a classroom globe. Thermometers were then placed at the center of each illuminated area to measure the rate of temperature increase. Readings were taken over a period of 30 minutes.

Students most likely observed that the temperature of area *A* increased at a

- (1) slower rate than the temperature of area *B* because area *A* received rays that were less concentrated
 (2) slower rate than the temperature of area *B* because area *A* received rays that were more slanted
 (3) faster rate than the temperature of area *B* because area *A* received rays that were more perpendicular to the surface
 (4) faster rate than the temperature of area *B* because area *A* received rays with less total energy



The graph below shows changes in carbon dioxide concentrations in Earth's atmosphere over a 140-year period. Carbon dioxide concentrations are shown in parts per million (ppm).



17. This significant change in CO₂ concentration is most likely caused by
- (1) decreased cloud cover, and is predicted to decrease average global temperatures
 - (2) decreased volcanic activity, and is predicted to increase average global temperatures
 - (3) increased use of fossil fuels, and is predicted to increase average global temperatures
 - (4) increased El Niño activity, and is predicted to decrease average global temperatures
18. Which combination of date and location would have the greatest duration of insolation?
- (1) June 21st within the Antarctic Circle
 - (2) March 21st at the Equator
 - (3) December 21st within the Antarctic Circle
 - (4) June 21st in New York
19. Which side of a house in New York State would receive the most insolation at noon?
- | | |
|-----------|----------|
| (1) north | (3) east |
| (2) south | (4) west |
20. During the time period between June 1st and August 1st, the duration of insolation of a location in New York will
- | | |
|--------------------|-----------------------------|
| (1) increase, only | (3) decrease, then increase |
| (2) decrease, only | (4) increase, then decrease |