Base your answers to questions 1 through 5 on the diagrams below which show the steps used to determine the amount of heat held by equal masses of iron, copper, lead, and granite.



STEP E Repeat steps C and D with each sample.

- 1. The movements of water molecules that transfer heat from one place to another within the water are called
 - A) radiation waves

- B) transverse waves
- C) conduction collisions D) convection currents
- 2. The granite sample is transferred from the boiling water to the room-temperature water. Why is the total heat lost by the granite greater than the total heat gained by the room-temperature water?
 - A) The granite sample had less volume than the other samples.
 - B) The granite sample lost some heat to the air as it was being transferred.
 - C) Water gained heat from the insulated container.
 - D) Water has a lower specific heat than the granite sample.
- 3. This method of determining the amount of heat absorbed by substances assumes that the energy lost by a heat source is
 - A) refracted by a heat sink B) reflected by a heat sink
 - C) absorbed by a heat sink D) scattered by a heat sink
- 4. Which substance has the highest specific heat?
 - A) copper B) granite C) iron D) lead
- 5. Why must the water be kept boiling in step *B*?
 - A) All samples must be heated to the same high temperature.
 - B) Boiling changes the melting point of the materials being tested.
 - C) The samples must be heated above 100°C.
 - D) Less energy is lost during a phase change.

- 6. How do clouds affect the temperature at the Earth's surface?
 - A) Clouds block sunlight during the day and prevent heat from escaping at night.
 - B) Clouds block sunlight during the day and allow heat to escape at night.
 - C) Clouds allow sunlight to reach the Earth during the day and prevent heat from escaping at night.
 - D) Clouds allow sunlight to reach the Earth during the day and allow heat to escape at night.

Base your answers to questions 7 and 8 on the diagram below. Soil and water were heated for 10 minutes from a starting temperature of 20°C.



- 7. After the heat lamp is turned off and removed from the area, how will the cooling rates of the soil and water compare?
 - A) The soil will cool faster because it is a good reflector.
 - B) The soil will cool faster because it has a lower specific heat.
 - C) The water will cool faster because it is a good absorber.
 - D) The water will cool faster because it has a higher specific heat.
- 8. What were the rates of heating for the soil and water?
 - A) soil: 1.8° C/min; water: 0.4° C/min
 - B) soil: 9° C/min; water: 2° C/min
 - C) soil: 20° C/min; water: 20° C/min
 - D) soil: 38° C/min; water: 24° C/min
- 9. When 1 gram of liquid water at 0° Celsius freezes to form ice, how many total Joules of heat are lost by the water?

A) 4.18 B) 2.11 C) 334 D) 2260

10. The graph below shows the average daily temperatures and the duration of insolation for a location in the mid-latitudes of the Northern Hemisphere during a year.



Compared to the date of maximum duration of insolation, the date of maximum surface temperature for this location is

- A) earlier in the year
- B) later in the year
- C) the same day of the year
- 11. Which factor has the greatest influence on the number of daylight hours that a particular Earth surface location receives?
 - A) longitude
 - B) latitude
 - C) diameter of Earth
 - D) distance from the Sun
- 12. One result of a large volcanic eruption is that surface air temperatures decrease over a sizable region of Earth. This phenomenon occurs because volcanic eruptions usually *decrease* the
 - A) transparency of the atmosphere
 - B) number of dust particles entering the atmosphere
 - C) amount of moisture in the atmosphere
 - D) reflection of sunlight within the atmosphere
- 13. Why are carbon dioxide and water vapor called the greenhouse gases?
 - A) They are found in varying amounts in Earth's atmosphere.
 - B) They are found in fixed amounts in Earth's bedrock.
 - C) They are good reflectors of infrared radiation.
 - D) They are good absorbers of infrared radiation.
- 14. 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

Base your answers to questions 15 through 20 on the diagram below which shows a post located in the Northern Hemisphere. Five different shadows, A', B', C', D', and E', are cast on a certain day by the post when the Sun is in positions A, B, C, D, and E, respectively.



- 15. Which statement would be true if this post were located at the Equator on March 21?
 - A) There would be no shadows at sunrise or sunset.
 - B) There would be no shadow at solar noon.
 - C) Shadow C' would point north at solar noon.
 - D) Shadow C' would point south at solar noon.
- 16. In the Northern Hemisphere, the intensity of insolation during the year is greatest when
 - A) shadow A' is longest
 - B) shadow D' is longest
 - C) shadow C' is shortest
 - D) shadow E' is shortest
- 17. Which motion causes the apparent daily path of the Sun shown in the diagram?
 - A) the Sun's revolution
 - B) the Sun's rotation
 - C) the Earth's revolution
 - D) the Earth's rotation
- 18. What would be the approximate duration of insolation for this location when shadow *C'* reaches its greatest length during the year?

A)	10 hours	B) 12 hours
C)	15 hours	D) 24 hours

- 19. From September 23 to December 20, the length of the shadow at noon will
 - A) decrease B) increase
 - C) remain the same

20. What would be the approximate duration of insolation for this location when shadow C' reaches its greatest length during the year?

A) 9 hours	B) 12 hours
C) 15 hours	D) 24 hours

21. The diagrams below represent Earth's tilt on its axis on four different dates. The shaded portion represents the nighttime side of Earth. Which diagram best represents the day on which the longest duration of insolation occurs in New York State?



- 22. What happens to most of the sunlight that strikes a dark-colored area of the Earth's surface?
 - A) It is reflected and scattered as potential energy.
 - B) It is reflected and diffused as ultraviolet radiation.
 - C) It is absorbed and reflected as light.
 - D) It is absorbed and reradiated as heat.
- 23. Insolation is often converted into potential energy by
 - A) evaporation of water from the oceans
 - B) formation of fog in a valley
 - C) freezing of water droplets on a highway
 - D) precipitation of rain from a thunderstorm
- 24. On June 21, some Earth locations have 24 hours of daylight. These locations are all between the latitudes of

A) 0° and $23\frac{1}{2}^{\circ}$ N B) $23\frac{1}{2}^{\circ}$ N and 47° N C) 47° N and $66\frac{1}{2}^{\circ}$ N D) $66\frac{1}{2}^{\circ}$ N and 90° N

Base your answers to questions 25 through 28 on

the graph below which shows the temperatures recorded when a sample of water was heated from -100°C to 200°C. The water received the same amount of heat every minute.



- B) a dark-green forest
- C) a beach with white sand
- D) a snow-covered field

- 34. An increase in latent heat can cause liquid water to
 - A) melt B) condense
 - C) freeze D) evaporate

35. The cross section below shows two compartments of water of equal volume insulated by Styrofoam and separated by a metal dividing wall, forming a closed energy system.



When the temperature of the water in compartment A decreases by 10°C, the temperature of the water in compartment B will

- A) remain unchanged
- B) decrease by only 5°C
- C) decrease by approximately 10°C
- D) increase by approximately 10°C
- 36. The diagram below shows the noontime shadow cast by a vertical post located in New York State.



Which letter indicates a location west of the post?

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

- 37. Which change would cause a *decrease* in the amount of insolation absorbed at Earths surface?
 - A) a decrease in cloud cover
 - B) a decrease in atmospheric transparency
 - C) an increase in the duration of daylight
 - D) an increase in nitrogen gas

38. The diagram below shows the apparent path of the Sun for an observer in New York State.



For this observer, the intensity of insolation is *least* when the Sun is at point

A)
$$A$$
 B) B C) C D) D

39. The table below shows the duration of insolation (hours of daylight) measured by four observers, *W*, *X*, *Y*, and *Z*, at four different Earth latitudes on both March 21 and June 21. There were clear skies at all four latitudes on both days.

Observer	Duration of Insolation March 21	Duration of Insolation June 21
W	12 hr	0 hr
x	12 hr	12 hr
Ŷ	12 hr	18 hr
Ζ	12 hr	24 hr

Which observer was located at the Equator?

- A) W B) X C) Y D) Z
- 40. For weeks after a series of major volcanic eruptions, Earth's surface air temperatures are often
 - A) warmer because ash and dust decrease atmospheric transparency
 - B) warmer because ash and dust increase atmospheric transparency
 - C) cooler because ash and dust decrease atmospheric transparency
 - D) cooler because ash and dust increase atmospheric transparency
- 41. As heat energy is added to an open container of boiling water, the temperature of the boiling water will
 - A) decrease B) increase
 - C) remain the same
- 42. 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

43. Base your answer to the following question on the diagram below, which shows the tilt of Earth on its axis in relation to the Sun on one particular day. Points A through E are locations on Earth's surface. Point D is located in Virginia. The dashed line represents Earth's axis.



On this day, which location has the greatest number of hours of daylight?

Base your answers to questions 44 and 45 on the graph below which shows the temperatures recorded when a sample of water was heated at a constant rate from -50°C to 100°C during a 20-minute period.



44. Between points D and E the water most likely was

- A) freezing B) melting
- C) vaporizing D) condensing
- 45. Between which points was the temperature changing at the greatest rate?

A) A and B	B) B and C
C) C and D	D) D and E

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

A) condensation	B) freezing
C) evaporation	D) melting

C) evaporation

47. The data table below shows the temperatures of two similar objects for 10 minutes after the objects were placed near each other.

Time	Temperature (°C)	
(minutes)	Object A	Object B
0	32	18
2	29	19
4	26	20
6	25	20
8	24	21
10	23	21

Which statement is best supported by the data?

- A) Some of the heat energy lost by object B was gained by object A.
- B) Most of the heat energy lost by object A was gained by the environment.
- C) Both objects lost heat energy.
- D) Both objects gained heat energy.
- 48. An object that is a good radiator of electromagnetic waves is also a good
 - A) insulator from heat
 - B) reflector of heat
 - C) absorber of electromagnetic energy
 - D) refractor of electromagnetic energy
- 49. An increase in which gas in Earth's atmosphere will most significantly increase global temperatures?
 - A) methane
 - C) nitrogen D) hydrogen
- B) oxygen

Base your answers to questions **50** through **52** on the graph below, which shows the temperature increase of samples of water, granite, iron, and lead. Each sample has a mass of 100 grams. Each sample was placed an equal distance from a light bulb and heated for a 10-minute period. This investigation was performed at room temperature under ordinary classroom conditions.



- 50. Which statement best describes the amount of energy received by the samples?
 - A) The water received the most energy.
 - B) The lead received the most energy.
 - C) The granite received the most energy.
 - D) All samples received the same amount of energy.

51. Note that this question only has three choices.

How do the wavelengths of electromagnetic energy absorbed by the samples compare to the wavelengths reradiated by the samples?

- A) The reradiated wavelengths are shorter.
- B) The reradiated wavelengths are longer.
- C) The absorbed and reradiated wavelengths are the same.
- 52. Which sample would decrease in temperature at the greatest rate after the heat source is removed?

A) iron	B) lead
C) granite	D) water

- 53. Heat energy transfer will normally occur between two objects that are close to each other if the objects have different
 - A) specific heatsB) temperaturesC) massesD) densities
- 54. The greatest amount of energy would be gained by 1,000 grams of water when it changes from
 - A) water vapor to liquid water
 - B) liquid water to water vapor
 - C) liquid water to ice
 - D) ice to liquid water

Base your answers to questions **55** and **56** on the graph below which shows the results of a laboratory activity in which a sample of ice at -50° C was heated at a uniform rate for 80 minutes. The ice has a mass of 200 grams.



55. During which interval of the graph is a phase change occurring?

A) A to B	B) E to F

- C) C to D
 D) D to E
 56. Which change could shorten the time needed to melt
 - the ice completely?A) using colder ice
 - B) stirring the sample more slowly
 - C) reducing the initial sample to 100 grams of ice
 - D) reducing the number of temperature readings taken
- 57. Conduction is the transfer of heat energy by
 - A) density differences
 - B) molecular contact
 - C) electromagnetic waves
 - D) movement through a vacuum
- 58. Which process transfers energy primarily by electromagnetic waves?
 - A) radiation B) ev
 - C) conduction
- B) evaporationD) evaporation
- D) convection

59. The diagram below shows the types of electromagnetic energy given off by the Sun. The shaded part of the diagram shows the approximate amount of each type actually reaching Earth's surface.



Which conclusion is best supported by the diagram?

- A) All types of electromagnetic energy reach Earth's surface.
- B) Gamma rays and x-rays make up the greatest amount of electromagnetic energy reaching Earth's surface.
- C) Visible light makes up the greatest amount of electromagnetic energy reaching Earth's surface.
- D) Ultraviolet and infrared radiation make up the greatest amount of electromagnetic energy reaching Earth's surface.
- 60. The diagram below shows a student heating a pot of water over a fire. The arrows represent the transfer of heat. Letter A represents heat transfer through the metal pot, B represents heat transfer by currents in the water, and C represents heat that is felt in the air surrounding the pot.



Which table correctly identifies the types of heat transfer at A, B, and C?

A)	Letter	Type of Heat Transfer
	A	conduction
	В	radiation
	С	convection

C)	Letter	Type of Heat Transfer
	А	radiation
	В	conduction
	С	convection

3)	Letter	Type of Heat Transfer
	A	conduction
	В	convection
	С	radiation
D)	Letter	Type of Heat Transfer
D)	Letter A	Type of Heat Transfer radiation
D)	Letter A B	Type of Heat Transfer radiation convection

Regents Review #3

Base your answers to questions **61** through **63** on the diagram and table below. The diagram shows a cross section of a solar-energy collecting system constructed as a portion of a wall of a house. It consists of an energy-absorbing surface, a clear glass covering, and air ducts through the wall into the house. The table gives the house temperatures during a spring day. No other heat source is available for the house.



Time of Day	House Air Temperature (°C)
6 a.m.	12
8 a.m.	14
10 a.m.	16
noon	19
2 p.m.	22
4 p.m.	20

61. Which diagram best represents the direction of air flow through the system under normal solar heating conditions?



62. In Connecticut, on which exterior wall should the solar collector be placed to receive the most insolation?

- A) a north-facing wall
- B) a south-facing wall
- C) an east-facing wall D) a west-facing wall
- 63. When did the maximum air temperature occur in the house?
 - A) just before sunrise
 - B) just before the time of the maximum angle of insolation for the day
 - C) just after the time of the maximum angle of insolation for the day
 - D) just after sunset
- 64. The diagram below shows four surfaces of equal area that absorb insolation.



Base your answers to questions **65** through **67** on the graph below, which shows the amount of insolation during one year at four different latitudes on Earth's surface.



Insolation at Different Latitudes



- 65. Why is insolation 0 cal/cm²/min from October through February at 90° N?
 - A) Snowfields reflect sunlight during that time.
 - B) Dust in the atmosphere blocks sunlight during that time.
 - C) The Sun is continually below the horizon during that time.
 - D) Intense cold prevents insolation from being absorbed during that time.
- 66. Why is less insolation received at the equator in June than in March or September?
 - A) The daylight period is longest at the equator in June.
 - B) Winds blow insolation away from the equator in June.
 - C) The Sun's vertical rays are north of the equator in June.
 - D) Thick clouds block the Sun's vertical rays at the equator in June.

67. This graph shows that insolation varies with

A) latitude and time of day

- B) latitude and time of year
- C) longitude and time of day
- D) longitude and time of year

68. The map below shows four locations in a temperature field. The temperature of each location is given in	69. Which color of the visible spectrum has the <i>shortest</i> wavelength?		
degrees Celsius.	A) violetB) blueC) yellowD) red		
B D	70. Which process requires water to gain 2260 Joules of energy per gram?		
	A) vaporizationB) condensationC) meltingD) freezing		
Heat energy will normally flow from	71. What is the basic difference between ultraviolet, visible, and infrared radiation?		
A) A to B B) A to C C) B to D D) D to C	A) half-lifeB) temperatureC) wavelengthD) wave velocity		

72. 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.
- 73. The graph below shows the change in carbon dioxide concentration in parts per million (ppm) in Earth's atmosphere from 1960 to 1990.



The most likely cause of the overall change in the level of carbon dioxide from 1960 to 1990 is an increase in the

- A) number of violent storms
- B) number of volcanic eruptions
- C) use of nuclear power
- D) use of fossil fuels

74. Base your answer to the following question on the graphs below which show the intensity and wavelength of radiation given off by the Earth's surface at locations *A*, *B*, and *C*. The temperature of the ground surface is shown for each location.



Which graph best represents the radiation intensity and wavelengths for another Earth location that has a temperature of 10°C?



- 75. On a given day, which factors have the most effect on the amount of insolation received at a location on the Earth's surface?
 - A) longitude and elevation
 - B) latitude and elevation
 - C) longitude and time of day
 - D) latitude and time of day
- 76. Most insolation striking a smooth, light-colored, solid surface is
 - A) refracted B) transmitted
 - C) reflected D) absorbed

Base your answers to questions 77 through 79 on the diagrams and graphs below. The diagrams show the general effect of the Earth's atmosphere on insolation from the Sun at middle latitudes during both clear-sky and cloudy-sky conditions. The graph shows the percentage of insolation reflected by the Earth's surface at different latitudes in the Northern Hemisphere in winter.



EARTH'S SURFACE (45° NORTH LATITUDE)

- 77. Which factor keeps the greatest percentage of insolation from reaching the Earth's surface on cloudy days?
 - A) absorption by cloud droplets
- B) reflection by cloud droplets
- C) absorption by clear-air gas molecules D) reflection by clear-air gas molecules
- 78. Which statement best explains why, at high latitudes, reflectivity of insolation is greater in winter than in summer?
 - A) The North Pole is tilted toward the Sun in winter.
 - B) Snow and ice reflect almost all insolation.
 - C) The colder air holds much more moisture.
 - D) Dust settles quickly in cold air.
- 79. The radiation that passes through the atmosphere and reaches the Earth's surface has the greatest intensity in the form of
 - A) visible-light radiation B) infrared radiation
 - C) ultraviolet radiation D) radio-wave radiation

80. Which type of land surface would probably reflect the	81. All forms of electromagnetic energy have		
most incoming solar radiation?	A) transverse wave properties		
A) light colored and smooth	B) the same temperature		
B) light colored and rough	C) the same wavelength		
C) dark colored and smooth	D) their own half-life		
D) dark colored and rough			

82. The graph below shows the general relationship between latitude and the duration of insolation on a particular day of the year.



Which date is represented by the graph?

- A) March 21 B) June 21
- C) September 21 D) December 21
- 83. Which graph best shows the length of a shadow cast from sunrise to sunset by a flagpole in New York State?



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



85. Which graph best represents the relationship between the angle of insolation and the intensity of insolation?



- 86. During which phase change of water is the most energy released into the environment?
 - A) water freezing
 - B) ice melting
 - C) water evaporating
 - D) water vapor condensing

87. Equal volumes of the four samples shown below were placed outside and heated by energy from the Sun's rays for 30 minutes.



- 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.
- 89. Pieces of lead, copper, iron, and granite, each having a mass of 1 kilogram and a temperature of 100°C, were removed from a container of boiling water and allowed to cool under identical conditions. Which piece most likely cooled to room temperature first?
 - A) copper B) lead
 - D) granite C) iron
- 90. How many times will the Sun's perpendicular rays cross Earth's Equator between March 1 of one year and March 1 of the next year?

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

- A) Clear skies usually accompany a warm front.
- B) Clear skies occur most often during nighttime hours.
- C) Clouds increase the amount of heat energy escaping the Earth's atmosphere at night.
- D) Clouds prevent much of the Sun's heat energy from reaching the Earth's surface during the daytime hours.
- 92. Which two gases have been added to Earth's atmosphere in large amounts and are believed to have increased global warming by absorbing infrared radiation?
 - A) neon and argon
 - B) chlorine and nitrogen
 - C) hydrogen and helium
 - D) methane and carbon dioxide

93. In which diagram is the observer experiencing the greatest intensity of insolation?



94. Which diagram best represents visible light rays after striking a dark, rough surface?



- 95. Very cold climates occur at Earth's North and South Poles because the polar regions
 - A) are usually farthest from the Sun
 - B) absorb the greatest amount of insolation
 - C) receive the most hours of daylight
 - D) receive low-angle insolation

96. Which diagram best shows how air inside a greenhouse warms as a result of energy from the Sun?



97. The diagram below shows a light source that has been heating two metal containers of air for 10 minutes. Both cups are made of the same material and are equal distances from the light source.



Compared to the amount of energy reflected by the shiny cup during the 10 minutes of heating, the amount of energy reflected by the black cup is

- A) less B) greater
- C) the same
- 98. Scientists are concerned about the decrease in ozone in the upper atmosphere primarily because ozone protects life on Earth by absorbing certain wavelengths of
 - A) x-ray radiation
 - B) ultraviolet radiation
 - C) infrared radiation
 - D) microwave radiation

99. The table below shows the duration of insolation at different latitudes for three different days during the year.

Latitude	Day 1 Duration of Insolation (hours)	Day 2 Duration of Insolation (hours)	Day 3 Duration of Insolation (hours)	
90° N	24	12	0	
80° N	24	12	0	
70° N	24	12	0	
60° N	18 <u>1</u>	12	$5\frac{1}{2}$	
50° N	$16\frac{1}{4}$	12	$7\frac{3}{4}$	
40° N	15	12	9	
30° N	14	12	10	
20° N	13 <u>1</u>	12	$10\frac{3}{4}$	
10° N	$12\frac{1}{2}$	12	$11\frac{1}{2}$	
0°	12	12	12	

Which dates are represented most correctly by Day 1, Day 2, and Day 3, respectively?

- A) March 21, September 22, December 21
- C) September 22, December 21, March 21
- B) June 21, September 22, December 21

gram of water

- D) December 21, March 21, June 21
- 100.The air above a burning candle is heated and rises. Which table correctly identifies the type of heat transfer within the rising air and the change in air density above the burning candle?

A)			B)			7
A)	Type of Heat Transfer	Change in Air Density	D)	Type of Heat Transfer	Change in Air Density	
	conduction	density increases		conduction	density decreases	
(\mathbf{C})		· · · · · · · · · · · · · · · · · · ·	י D)			1
0)	Type of Heat Transfer	Change in Air Density		Type of Heat Transfer	Change in Air Density	
	convection	density increases		convection	density decreases	
 101. 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 			n 102. How r lose w A) 4.1 C) 33	nany Joules of energ hen it freezes? [8 J B] 4 J D]	y does 1.0) 2.11 J) 2260 J	

103. Base your answer to the following question on the map below, which shows the location of the Heat Equator for July and January. A Heat Equator is a line connecting the locations of the highest average monthly temperatures.



Why does the location of the Heat Equator change more over the land than over the oceans?

- A) Land temperatures are cooler than ocean temperatures.
- B) The prevailing winds change direction as they pass over land.
- C) Hurricanes form over oceans and cool the water surfaces.
- D) Oceans have a higher specific heat than land.
- 104. The cross sections below show different patterns of air 105. The diagram below represents what normally happens movement in Earth's atmosphere. Air temperatures at to insolation as it enters the Earth's atmosphere. Earth's surface are indicated in each cross section. **Radiation reflected** back toward space Which cross section shows the most likely pattern of air movement in Earth's atmosphere that would result from the surface air temperatures shown? A) Total amount of Warm solar radiation Farth's surface B) Ċ 's surfa B Radiation Radiation C) absorbed by transmitted the atmosphere to the Earth Warm An increase in cloud cover and water vapor within the Earth's surface Earth's atmosphere will cause an increase in D) A) A and B, only B) A and C, only D) B and C, only C) C, only rth's su

106.The diagram below shows a laboratory box used to demonstrate the process of convection in the atmosphere.



Burning candle

Which diagram has arrows that show the direction of airflow that occurs when the candle is burning?







D)

C)



107. The diagram below shows a solid iron bar that is being heated in a flame.



The primary method of heat transfer in the solid iron bar is

- A) convection B) conduction
- C) absorption D) advection
- 108. 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
- 109. A student placed two containers of soil in direct sunlight for 10 minutes and observed that moist soil warmed more slowly than dry soil. Which statement best explains this difference?
 - A) The moist soil was darker and absorbed less energy.
 - B) The water in the moist soil absorbed energy, evaporated, and cooled the soil.
 - C) The dry soil was rougher and reflected more sunlight.
 - D) The dry soil was lighter in color and received less energy.

110. The diagram below represents energy being absorbed and reradiated by the Earth.



Which type of energy is represented by the radiation at *B*?

D) infrared energy

- A) insolation B) visible light
- C) ultraviolet rays