UNIT 6a TEST REVIEW
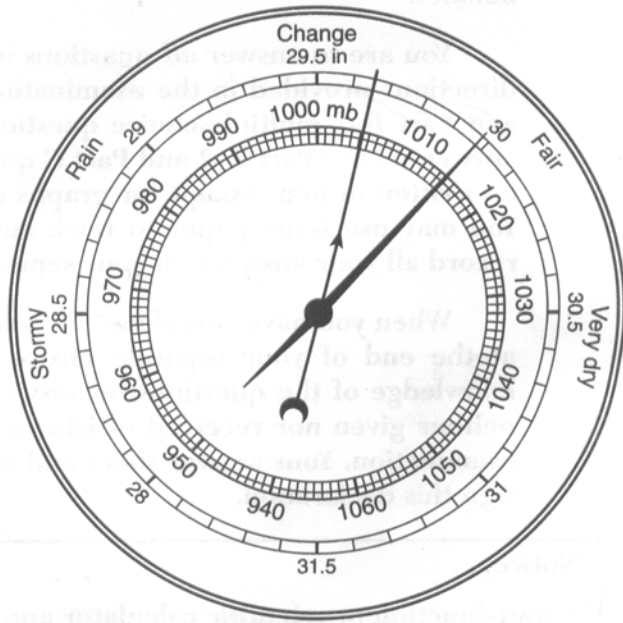
1. A weather instrument is shown below.
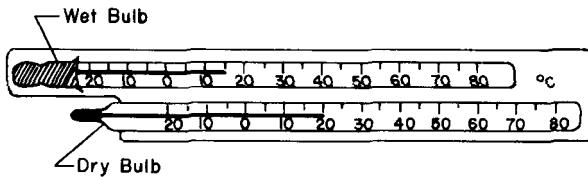

Which weather variable is measured by this instrument?
1) wind speed
2) precipitation
3) cloud cover
4) air pressure

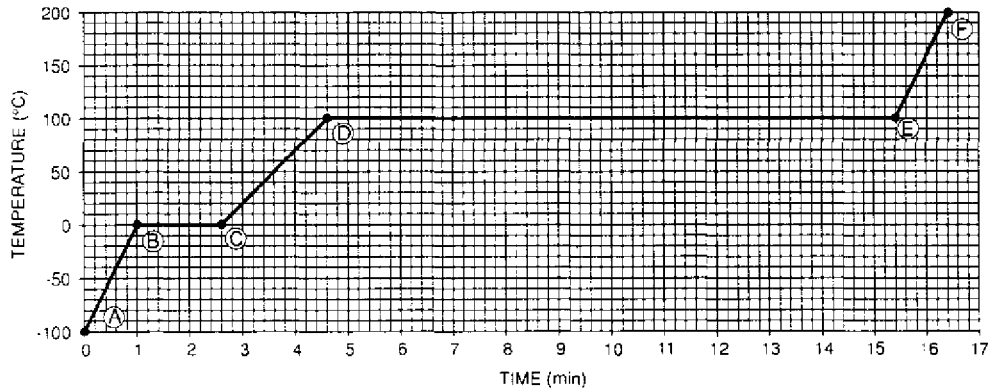2. Which weather station model indicates the greatest probability of precipitation?

3. What is the approximate dewpoint?

1) 5.0°C
2) 11°C
3) 15°C
4) 20.°C

Base your answers to questions **4** and **5** 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.

4. The greatest amount of energy was absorbed by the water between points
    1) *A* and *B*   2) *B* and *C*   3) *C* and *D*   4) *D* and *E*

5. At which point in time would most of the water be in the liquid phase?
    1) 1 minute   2) 14 minutes   3) 16 minutes   4) 4 minutes

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6. When the dry-bulb temperature is 14°C and the wet-bulb temperature is 8°C, the relative humidity is

    1) 6%   3) 25%

    2) 22%   4) 41%

7. Which process is primarily responsible for the transfer of energy by air currents within the Earth's atmosphere?

    1) convection   3) absorption

    2) radiation   4) conduction

Base your answers to questions **8** and **9** on the graph below which shows the amount of heat energy (calories) needed to raise the temperature of 1-gram samples of four different materials.
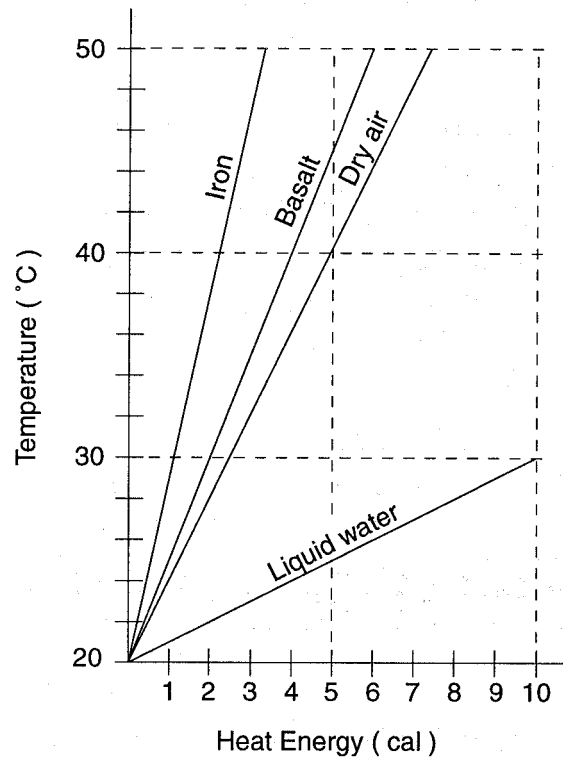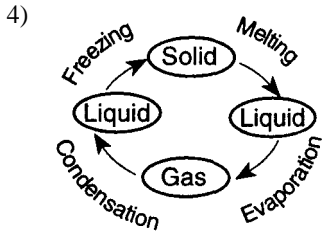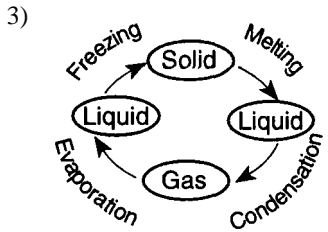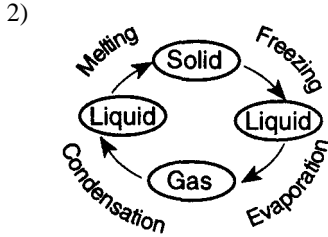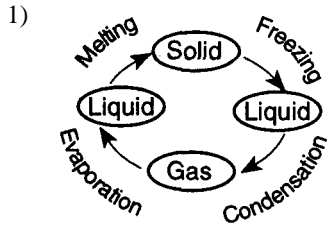

8. If all four materials were heated to 100°C and then allowed to cool, which material would show the most rapid drop in temperature?

    1) basalt   3) dry air

    2) iron   4) liquid water

9. Which of these materials has the highest specific heat?
   1) liquid water
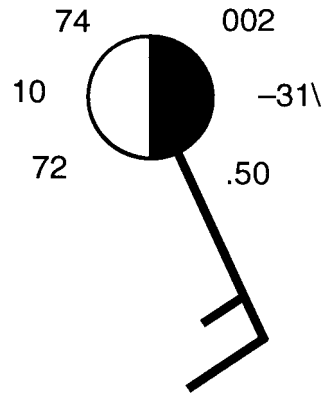   2) dry air
   3) basalt
   4) iron

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

1)

2)

3)

4)

11. By which process do light rays pass through window glass?
    1) conduction
    2) convection
    3) radiation
    4) compression

12. The station model below shows the weather conditions at Houston, Texas, at 9 a.m. on a particular day in June.


What was the barometric pressure at Houston 3 hours earlier on that day?
   1) 997.1 mb
   2) 999.7 mb
   3) 1003.3 mb
   4) 1009.1 mb

13. What is the dewpoint temperature when the dry-bulb temperature is 16°C and the wet-bulb temperature is 11°C?
   1) 5°C
   2) 7°C
   3) 9°C
   4) −17°C

14. The graph below shows the changes in air temperature and dewpoint temperature over a 24-hour period at a particular location. At what time was the relative humidity *lowest*?
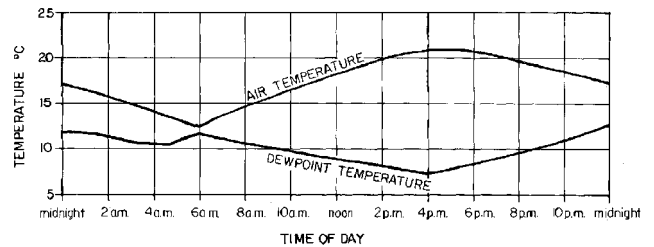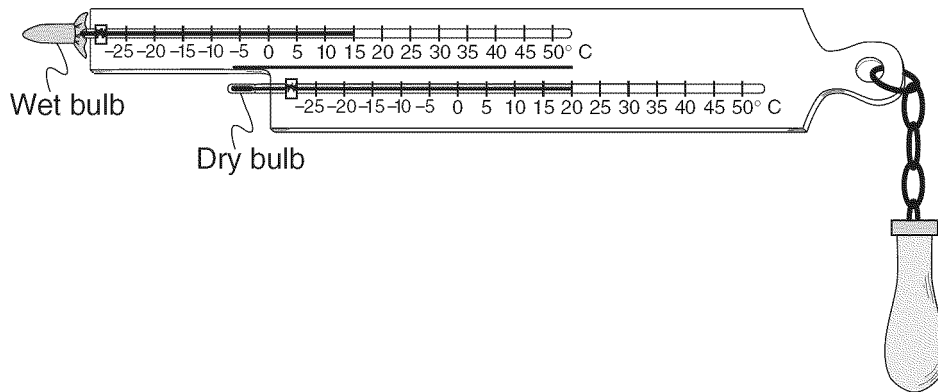

   1) midnight
   2) 6 a.m.
   3) 10 a.m.
   4) 4 p.m.

15. The air outside a classroom has a dry-bulb temperature of 10°C and a wet-bulb temperature of 4°C. What is the relative humidity of this air?
   1) 1%
   2) 14%
   3) 33%
   4) 54%

16. The diagram below shows a sling psychrometer.

Based on the dry-bulb temperature and the wet-bulb temperature, what is the relative humidity?
1) 66%　　　　　　　2) 58%　　　　　　　3) 51%　　　　　　　4) 12%

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17. What is the relative humidity when the air temperature is 29°C and the wet-bulb temperature is 23°C?
1) 6%
2) 20%
3) 54%
4) 60%

18. What is the wet-bulb temperature when the air temperature is 16°C and the relative humidity is 71%?
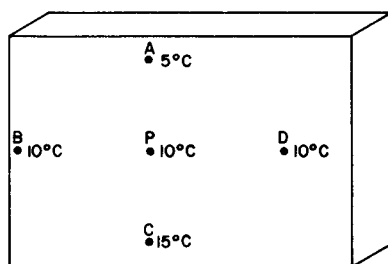1) 11°C
2) 13°C
3) 3°C
4) 19°C

19. Water loses energy when it changes phase from
1) gas to liquid
2) solid to liquid
3) solid to gas
4) liquid to gas

20. A temperature of 104°F is approximately equal to
1) 220°C
2) 214°C
3) 43°C
4) 40°C

21. The diagram below shows temperature values at various points in a solid piece of aluminum. Toward which point will heat flow from point *P*?

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

22. A temperature of 20°C is equal to a temperature of
1) –7°F
2) 36°F
3) 68°F
4) 293°F

23. As heat energy is added to an open container of boiling water, the temperature of the boiling water will
1) decrease
2) increase
3) remain the same

24. What is the dewpoint temperature when the dry-bulb temperature is 12°C and the wet-bulb temperature is 7°C?
1) 1°C
2) , 5°C
3) 6°C
4) 4°C

25. What is the approximate dewpoint temperature when the dry-bulb reading is 14°C and the wet-bulb reading is 8°C?
1) 1°C
2) 6°C
3) –6°C
4) –9°C

Base your answers to questions **26** through **28** 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.
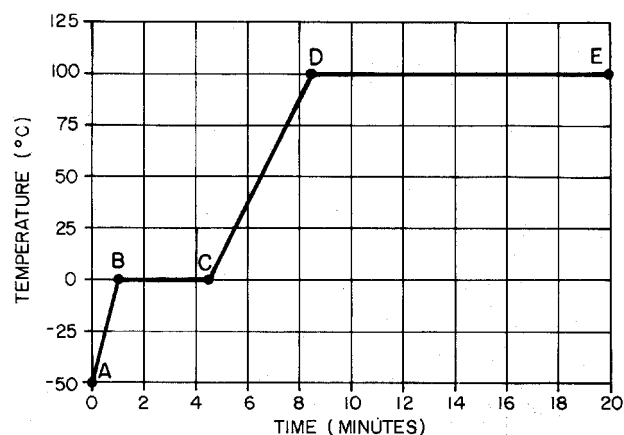
26. The water temperature reached 65°C after the sample had been heated for approximately how many minutes?
1) 5 min
2) 7 min
3) 3 min
4) 9 min

27. Between points *D* and *E* the water most likely was
    1) freezing
    2) melting
    3) vaporizing
    4) condensing

28. The greatest amount of energy is required to heat the sample from point
    1) *A* to point *B*
    2) *B* to point *C*
    3) *C* to point *D*
    4) *D* to point *E*

_____

29. What is the air pressure indicated on the weather station model shown below?

28   006
1✳   +02
25   .2
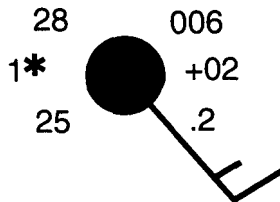
1) 900.6 mb
2) 960.0 mb
3) 1000.6 mb
4) 1006.0 mb

30. What is the approximate dewpoint temperature if the dry-bulb temperature is 18°C and the wet-bulb temperature is 11°C?
    1) 1° C
    2) , 10° C
    3) 7° C
    4) 4° C

31. The cross sections below show different patterns of air movement in Earth's atmosphere. Air temperatures at Earth's surface are indicated in each cross section. Which cross section shows the most likely pattern of air movement in Earth's atmosphere that would result from the surface air temperatures shown?

    1)

    2)

    3)

    4)
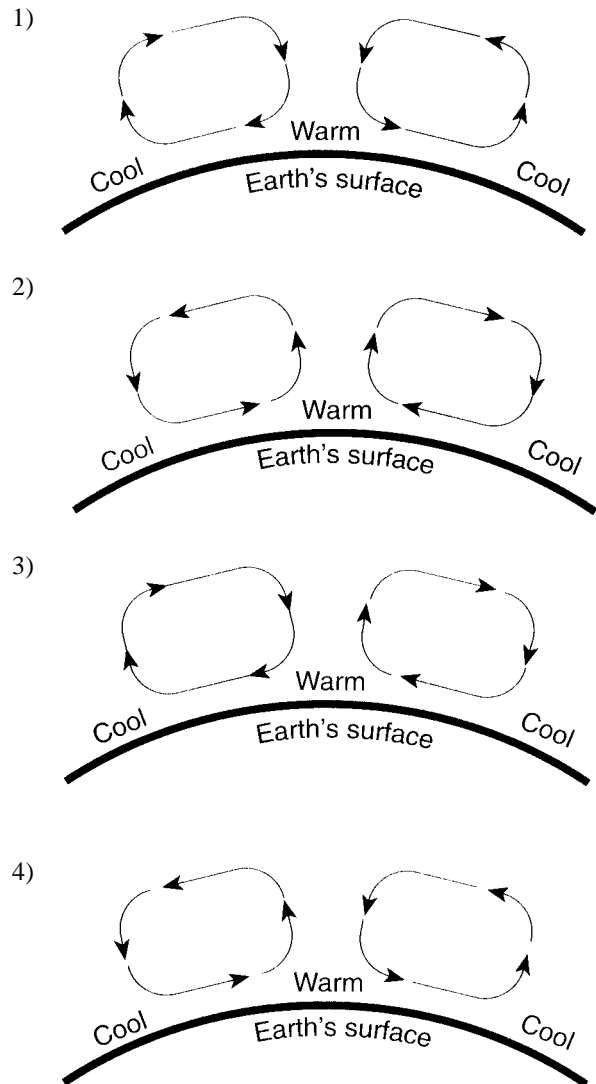
32. How many calories of latent heat does one gram of water lose when it freezes?
    1) 1 cal
    2) 32 cal
    3) 80 cal
    4) 540 cal

33. Which material requires the *least* amount of energy to change its temperature 1°C per gram?
    1) iron
    2) ice
    3) water
    4) lead

34. Which station model correctly shows the weather conditions of a thunderstorm with heavy rain?

1)

3)

2)

4)
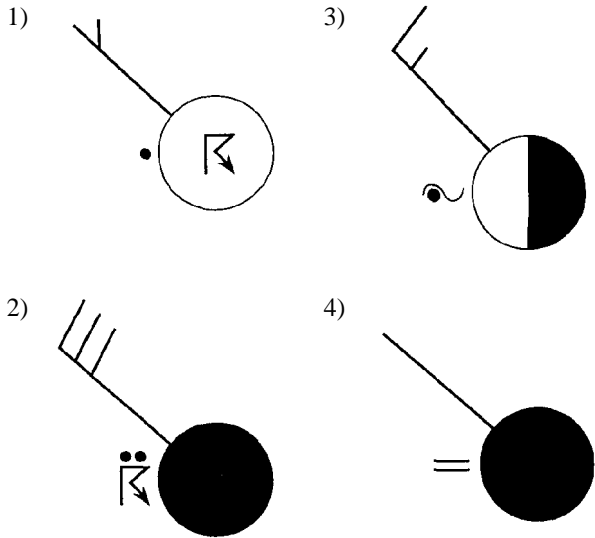
35. The diagram below shows a solid iron bar that is being heated in a flame.
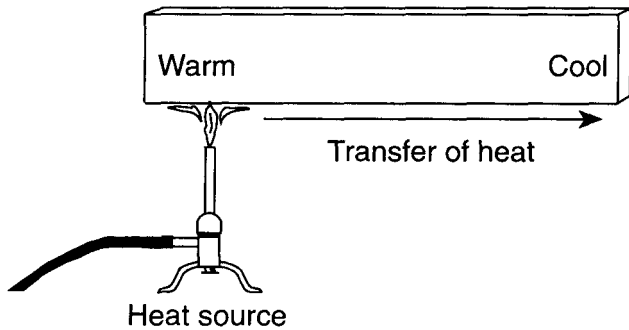
The primary method of heat transfer in the solid iron bar is

1) convection   3) absorption

2) conduction   4) advection

36. When the dry-bulb reading of a thermometer is 20°C and the wet-bulb reading is 11°C, the relative humidity is approximately

1) 17%   3) 33%

2) 30%   4) 55%

37. A weather station model for a location in New York State is shown below.
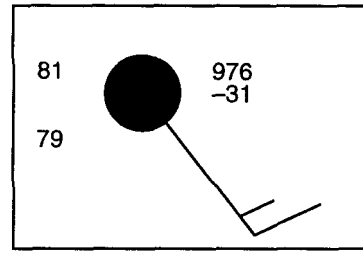
The air mass over this location is best described as

1) cold with low humidity and high air pressure
2) cold with high humidity and low air pressure
3) warm with high humidity and low air pressure
4) warm with low humidity and high air pressure

38. 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.

39. All of the glass containers shown below contain the same amount of water and are receiving the same amount of heat energy. In a given amount of time, the most water will evaporate from which container?

1)

2)

3)

4)
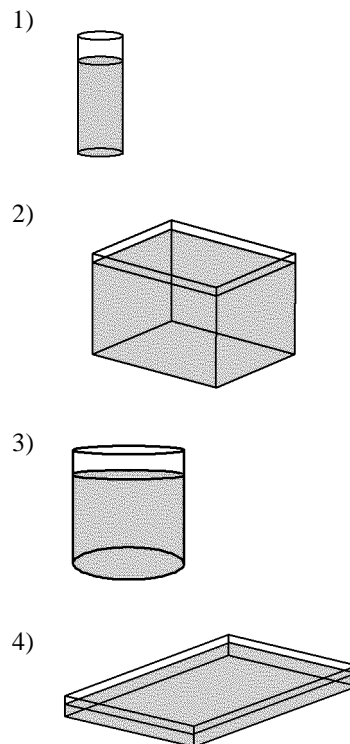
40. Which graph best shows the relationship between the probability of precipitation and the difference between air temperature and dewpoint?

1)

Probability of Precipitation

Difference Between Air Temperature and Dewpoint

2)

Probability of Precipitation

Difference Between Air Temperature and Dewpoint

3)

Probability of Precipitation

Difference Between Air Temperature and Dewpoint

4)

Probability of Precipitation

Difference Between Air Temperature and Dewpoint

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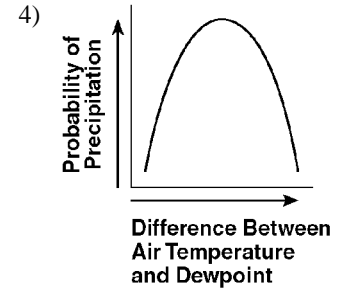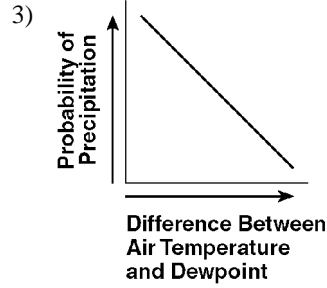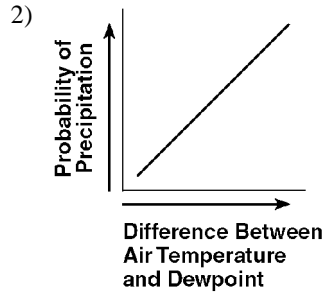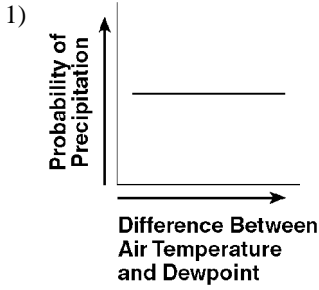
41. Which weather station model indicates the highest relative humidity?

1)
82 012
+2 /
62

2)
78 978
-2 \
75

3)
56 999
-3 \
49

4)
32 002
+5 /
24
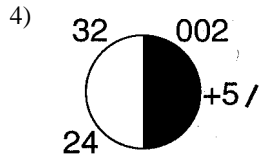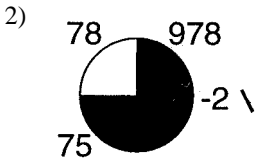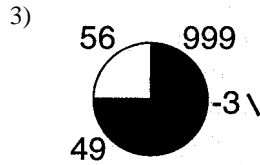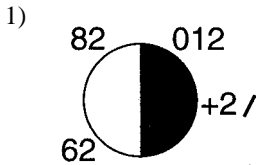
42. The map below shows four locations in a temperature field. The temperature of each location is given in degrees Celsius.

20°
•B

29°
•D

30°
•A

31°
•C
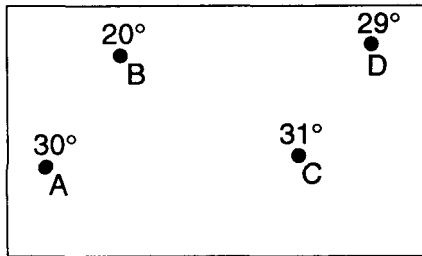
Heat energy will normally flow from

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

43. A parcel of air has a dry-bulb temperature of 24°C and a relative humidity of 55%. What is the dewpoint of this parcel of air?

1) 6°C   3) 24°C
2) 14°C   4) 29°C

44. By which process is heat energy transferred when molecules within a substance collide?

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

45. In which air sample will condensation most likely occur?

1)
Air
Temperature = –2°C
Dewpoint = –4°C
Clean Filtered Air

2)
Air
Temperature = 5°C
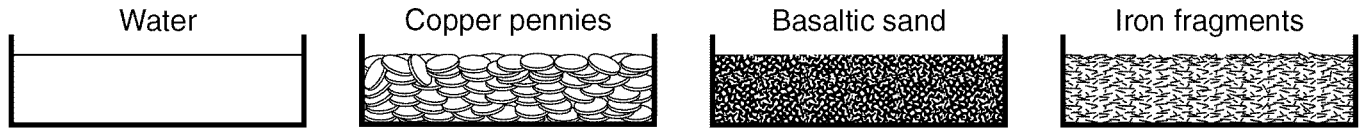Dewpoint = 5°C
Air Containing Tiny Particles

3)
Air
Temperature = 10°C
Dewpoint = 7°C
Air Containing Tiny Particles

4)
Air
Temperature = 20°C
Dewpoint = 20°C
Clean Filtered Air

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

Water

Copper pennies

Basaltic sand

Iron fragments

The surface temperature of which sample increased at the *slowest* rate?
1) water　　　　　　　2) copper pennies　　　　　　　3) basaltic sand　　　　　　　4) iron fragments

47. Which energy transformation occurs as a rock falls freely from the top of a vertical cliff?
1) The rock's potential energy and kinetic energy decrease.
2) The rock's potential energy decreases and the rock's kinetic energy increases.
3) The rock's potential energy increases and the rock's kinetic energy decreases.
4) The rock's potential energy and kinetic energy increase.

48. A sling psychrometer shows a dry-bulb reading of 14°C and a wet-bulb reading of 9°C. What are the dewpoint and the relative humidity?
1) , 10°C and 16%　　　3) 4°C and 16%
2) , 10°C and 50%　　　4) 4°C and 50%

49. A temperature of 73° Fahrenheit is approximately equal to a temperature of
1) 17° Celsius　　　3) 26° Celsius
2) 23° Celsius　　　4) 162° Celsius

50. Which diagram best represents the direction of convection currents around the burning wood of a campfire?
1)

2)

3)

4)
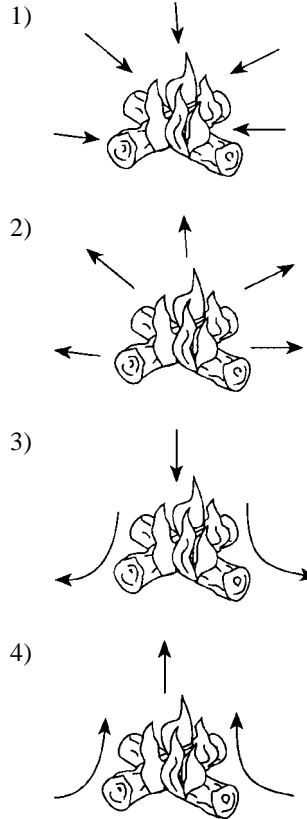
Reference Tables

1.   4

2.   3

3.   2

4.   4

5.   4

6.   4

7.   1

8.   2

9.   1

10.   4

11.   3

12.   3

13.   2

14.   4

15.   3

16.   2

17.   4

18.   2

19.   1

20.   4

21.   1

22.   3

23.   3

24.   1

25.   1

26.   2

27.   3

28.   4

29.   3

30.   4

31.   2

32.   3

33.   4

34.   2

35.   2

36.   2

37.   3

38.   2

39.   4

40.   3

41.   2

42.   1

43.   2

44.   1

45.   2

46.   1

47.   2

48.   4

49.   2

50.   4