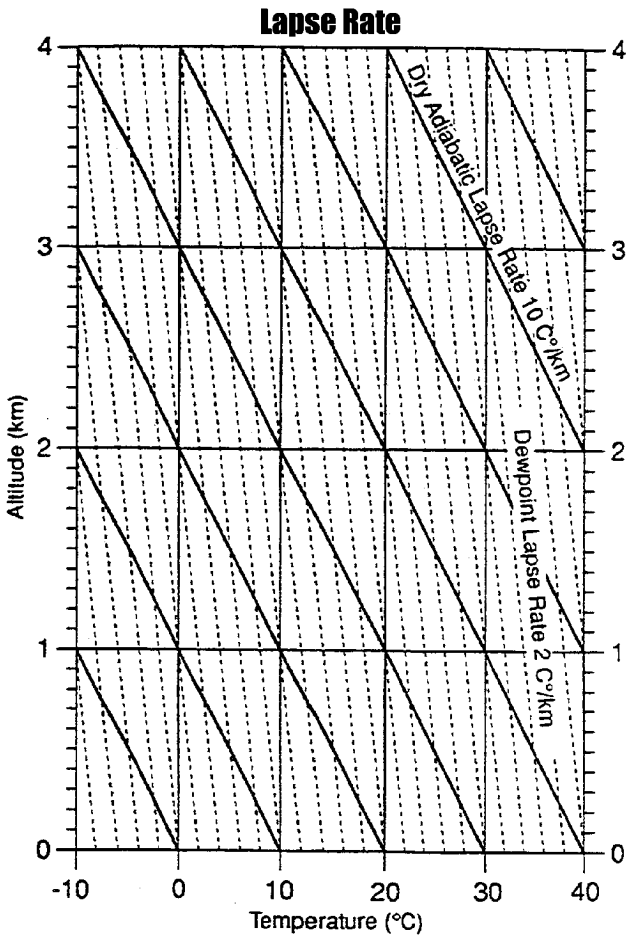
Name: _____




1) The rate of evaporation of water can be increased by
   A) decreasing the temperature of the water
   B) increasing the temperature of the air
   C) increasing the amount of moisture in the air
   D) decreasing the circulation of the air

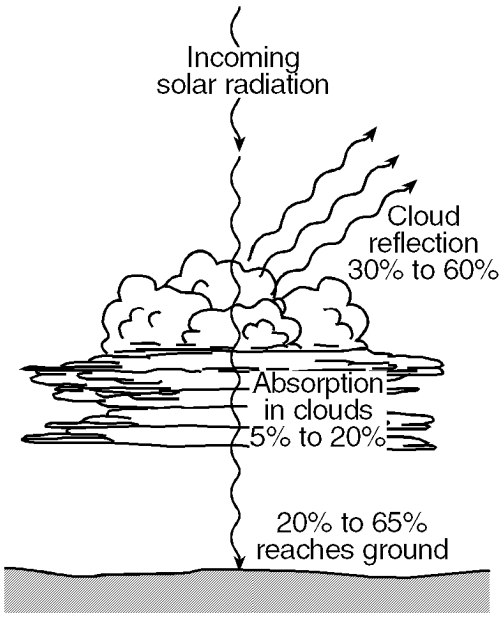
2) At what temperature would ice crystals form from air that has a dewpoint temperature of -6° C?
   A) -2° C
   B) 6° C
   C) 0° C
   D) -6° C

3) Which process is most likely to remove pollutants from the air?
   A) evaporation
   B) precipitation
   C) transpiration
   D) runoff

4) The rate of evaporation from the surface of a lake would be increased by
   A) an increase in the surface area of the lake
   B) a decrease in wind velocity
   C) an increase in the moisture content of the air
   D) a decrease in the amount of insolation

5) Which event will most likely occur in rising air?
   A) clearing skies
   B) cloud formation
   C) increasing temperature
   D) decreasing relative humidity

6) The diagram below represents the percentage of total incoming solar radiation that is affected by clouds.

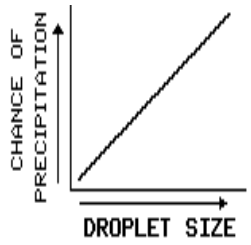


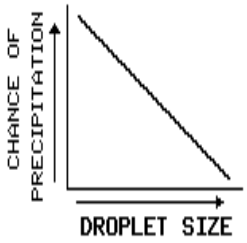

What percentage of incoming solar radiation is reflected or absorbed on cloudy days?
   A) 35% to 80%
   B) 5% to 30%
   C) 0%
   D) 100%

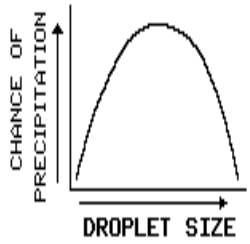
7) The energy gained by water during evaporation is later released by the water vapor during the process of
   A) transpiration
   B) condensation
   C) convection
   D) melting

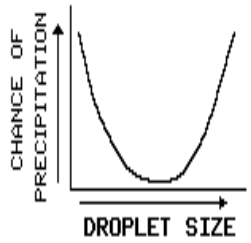
8) On a clear, dry day an air mass has a temperature of 20° C and a dewpoint temperature of 10° C. According to the *Earth Science Reference Tables*, about how high must this air mass rise before a cloud can form?
   A) 2.8 km
   B) 1.6 km
   C) 3.0 km
   D) 2.4 km

9) Which graph best represents the relationship between water droplet size and the chance of precipitation?

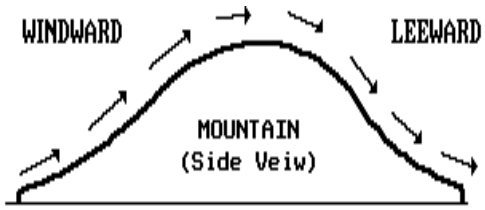
A)



B)



C)



D)


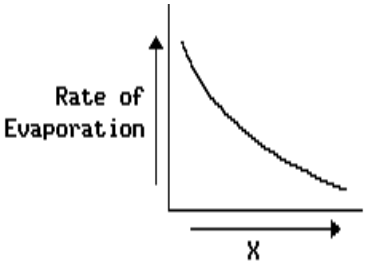

10) The diagram below shows the direction of movement of air over a mountain.




As the air moves down the leeward side of the mountain, the air will

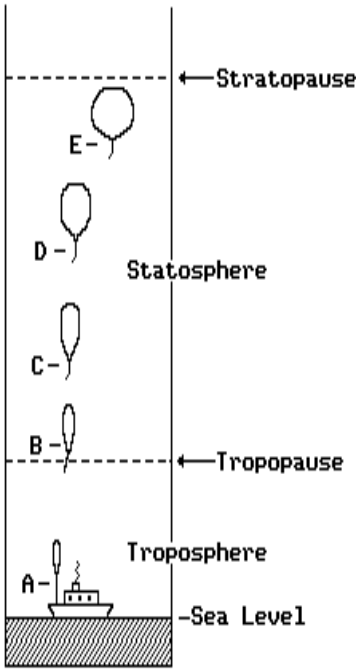
A) warm due to expansion
B) cool due to expansion
C) warm due to compression
D) cool due to compression

11) The graph below represents how the rate of evaporation of water is affected by a variable, *X*. Which variable is most likely represented by *X*?




A) moisture content of the air
B) temperature
C) exposed surface area
D) wind velocity

12) The drawing below represents five positions of a balloon after being released from a ship. The drawings of the balloon are not to scale compared to the altitude distances, but are to scale with each other.




Why is the balloon's appearance at position *E* different from the balloon's appearance at position *A*?

A) The outside air temperature is lower at *E* than at *A*.
B) There is more gas inside the balloon at *A* than at *E*.
C) There is a partial vacuum inside the balloon at *A*, but not at *E*.
D) The outside air pressure is lower at *E* than at *A*.

13) Condensation of water vapor in the atmosphere is most likely to occur when a condensation surface is available and

A) the temperature of the air is below 0°C
B) the air pressure is rising
C) the air is saturated with water vapor
D) a strong wind is blowing

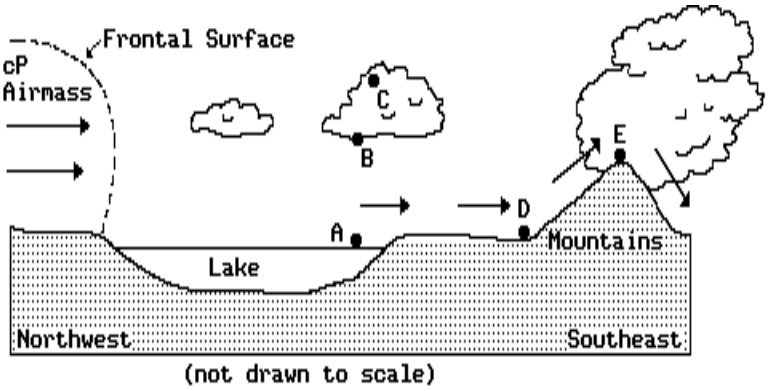
14) Which process most directly results in cloud formation?

A) transpiration
B) precipitation
C) radiation
D) condensation

15) A higher concentration of water vapor is found in the atmosphere over New York State in the summer than in the winter because in the summer there is a greater

A) rate of evapotranspiration
B) concentration of air pollutants
C) frequency of high pressure
D) amount of water in ground storage

16) The diagram below shows a common weather condition approaching a section of New York State.

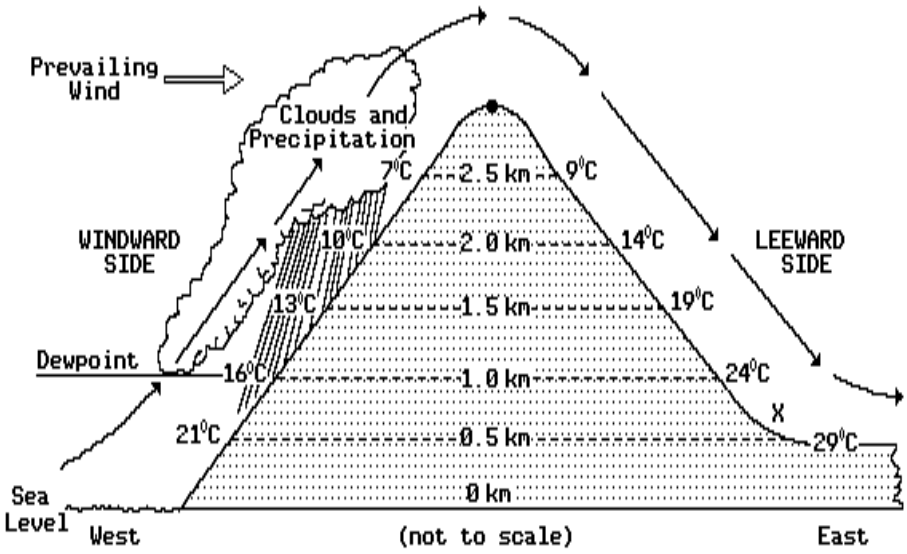



As the air moves from point *D* to point *E*, it will be

A) cooled by compression
B) warmed by expansion
C) cooled by expansion
D) warmed by compression

Questions 17 through 20 refer to the following:

The diagram below shows a mountain. The prevailing wind direction and air temperatures at different elevations on both sides of the mountain are indicated.




17) On which side of the mountain and at which elevation is the relative humidity probably 100%?

A) on the leeward side at 1.0 km
B) on the windward side at 1.5 km
C) on the leeward side at 2.5 km
D) on the windward side at 0.5 km

18) The air temperature on the leeward side of the mountain at the 1.5-kilometer level is higher than the temperature at the same elevation on the windward side. What is the probable cause for this?

A) Heat stored in the ocean keeps the windward side of the mountain warmer.
B) The insolation received at sea level is greater on the leeward side of the mountain.
C) The air on the windward side of the mountain has a lower adiabatic lapse rate than the air on the leeward side of the mountain.
D) Potential energy is lost as rain runs off the windward side of the mountain.

19) How does the temperature of the air change as the air rises on the windward side of the mountain between sea level and 0.5 kilometer?

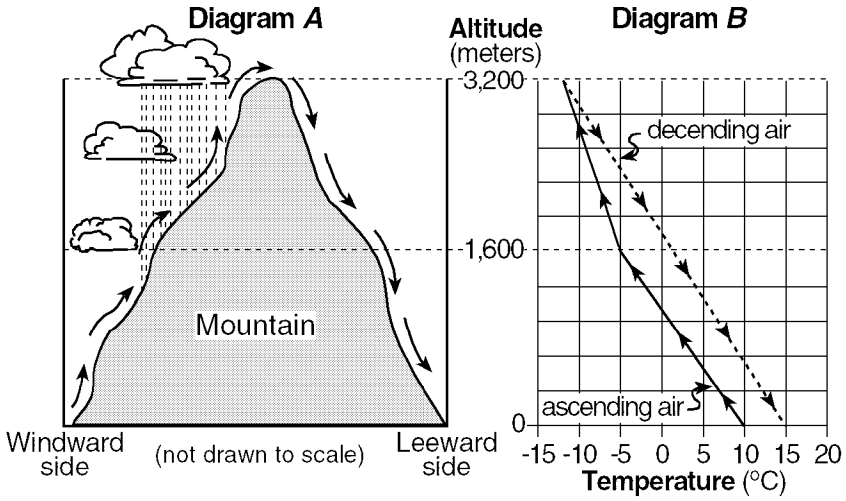
A) The air is warming due to expansion of the air.
B) The air is warming due to compression of the air.
C) The air is cooling due to expansion of the air.
D) The air is cooling due to compression of the air.

20) What would be the approximate air temperature at the top of the mountain?

A) 10° C
B) 12° C
C) 4° C
D) 0° C

Questions 21 through 25 refer to the following:

Diagram *A* below represents the flow of air over a mountain. Diagram *B* shows the temperature of the ascending and descending air at various levels.




21) At what location on the mountain is the relative humidity probably 100%?

A) on the windward side at 800 meters
B) on the leeward side at 2,000 meters
C) on the windward side at 2,500 meters
D) on the leeward side at 500 meters

22) Which statement *best* explains why clouds form at the 1,600-meter level on the windward side of the mountain?

A) The moisture in the rising air turned into a gas.
B) The temperature of the rising parcel of moist air cooled below the dewpoint.
C) The temperature of the rising parcel of moist air warmed above the dewpoint.
D) The rain from the clouds above was absorbed by the rising air.

23) What is the total increase in the temperature of the air as it descends from the top to the base of the mountain?

A) 22 C°
B) 27 C°
C) 15 C°
D) 3 C°

24) The air warms as it descends on the leeward side of the mountain because

A) air expands as it descends
B) more precipitation occurs on the leeward side of the mountain than on the windward side
C) air is heated by the Sun at the top of the mountain
D) air is compressed as it descends

25) What is the approximate temperature of the descending air at an elevation of 1,600 meters?

A) -12° C
B) +2° C
C) + 15° C
D) -5° C