NAME:_____PERIOD:_DATE:_____ENTRY NUMBER:__

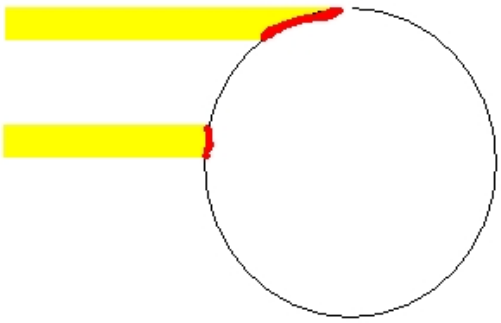
REVIEW FOR WEATHER AND CLIMATE TEST

1. Describe 3 types of heat transfer. Give an example of each.
   Convection- heat flow due to differences in density (temperature) in fluids such as air, water
   Conduction- transfer of heat between substances that are in direct contact with each other
   Radiation- heat transfer through electromagnetic radiation (does not need a medium to travel)

2. Would you expect convection in a lake? Why or why not?
No, you would not expect convection in a lake because the lake is warmed from above (sun) and since the warm water is less dense, you would not expect convection currents to form

3. What part of the world receives the most insolation? (What is the relationship between angle of insolation and latitude?)
   The tropics (close to equator) receives the most intense insolation. As you move away from the equator, latitude increases but the angle of insolation decreases.

4. Why does the air near the equator average higher temperatures than air near the poles? Draw a diagram to illustrate your point.



The equator receives for concentrated sun rays because of the angle of insolation.

5. How does the tilt of the Earth cause the seasons?
For example, when the N. hemisphere is tilted toward the sun, the angle of insolation is higher and the N. hemisphere receives more intense light- this is our summer. When the N. hemisphere is tilted away from the sun, the insolation it receives is less intense = winter. If the earth was not tilted, then we would expect similar weather all year (no seasons).

6. Compare Summer vs. Winter (day length, angle of insolation, tilt toward or away, amount of atmosphere)
Summer: longer days, greater angle of insolation, tilted toward sun, rays go through less atmosphere
Winter: shorter days, smaller angle of insolation, tilted away from sun, rays go through more atmosphere

7. Why does pressure decrease with increasing altitude?
   Because there is less air above you. Less air means less, less weight = less pressure.

8. Name/describe the layers of the atmosphere.

Troposphere- where we live, closest to earth, warmed by earth, weather occurs here, colder as you increase altitude
Stratosphere- warmer as you increase altitude, contains the ozone layer- warmed by the formation of ozone
Mesosphere- very cold here, colder as you increase altitude
Thermosphere- very high temperatures (but low heat- since atmosphere is so thin here), warmed by sun so warmer as you increase altitude.

9. Explain how the troposphere is warmed.
   Troposphere is warmed by the earth. The earth absorbs radiation from the sun and then re-radiates the energy as heat.

10. Describe how the troposphere differs from the other layers of the atmosphere.
Most dense part of the atmosphere, contains almost all of the water vapor, weather occurs here, warmed by earth

11. Where is the ozone layer located? *stratosphere*

12. Why do certain layers of the atmosphere increase in temperature with an increase in altitude?
Stratosphere- because it is warmed by the chemical reaction that forms ozone
Thermosphere- because it is warmed by the sun

13. What is a temperature inversion and why could it be bad for your health?
Temperature inversion- warm air sits over cold dense air, so no mixing occurs. This can trap pollutants that are bad for your health.

14. Where in the country would you expect the most variation in temp? Why?
In places that land locked because land has a much lower specific heat than water. So land changes temperature more quickly than water.

15. Describe the temperature and movement of air that results in high Pressure systems.
Cold air masses are dense and tend to sink, this results in high pressure.

16. What part of the Earth experiences consistent high pressure? Consistent low pressure?
Poles- Consistent high pressure, because it is cold
Equator- consistent low pressure, because it is warm

17. Winds always blow from _____ HIGH PRESSURE_____ to _____ LOW PRESSURE_____.

18. What causes the Coriolis effect? How does it affect Climate?
The rotation of the earth causes the Coriolis effect. The Coriolis effect causes winds and water to be deflected to the right in N. hemisphere and left in S. hemisphere.

19. Which is less dense humid air or dry air? Explain.

If temperature is constant, then humid air would be less dense because water is a light molecule. Less mass means less dense.

20. Over which of these would you expect low pressure, moist air to form? Circle the correct terms.
Maritime/ Continental **Polar/ Tropical**

21. What type of air mass is most likely to result in thunderstorms?
Low pressure systems

22. The upward movement of air in the atmosphere generally causes the temperature of that air to

_DECREASE__.

23. At temperate latitudes, the prevailing westerlies drive surface ocean currents __east___.

24. The amount of water vapor the air can hold depends on air temperature. At higher temperatures

the air can hold ____MORE_____ water vapor than it can at cooler temperatures.

25. As air rises, it **expands/compresses** and **warms/cools**. (circle the correct terms)

26. Compare:

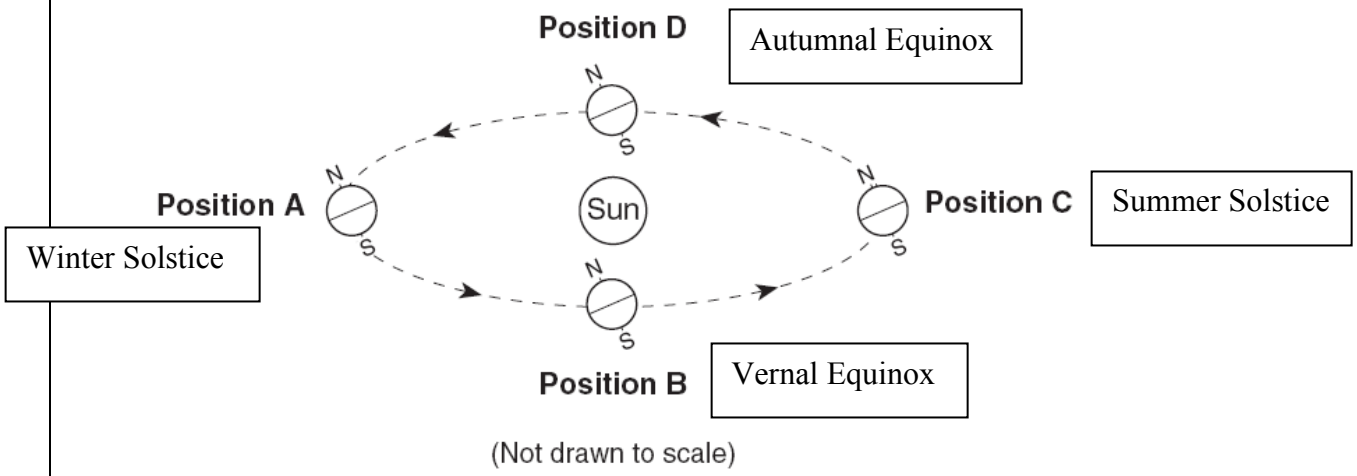
	Tahoe	Bay Area
Temp	Colder	Warmer
Pressure	Lower	Higher
Water boiling	Lower temp	Higher temp
Bag of chips	Expands	Does not expand

27. Another name for the leeward slope is
Rain shadow because all of the rain falls on the windward side of the mountain.

28. What causes the wind to blow?
Differences in pressure (density/temperature) in air masses. Gases "blow" from high to low pressure. Direction of wind is also affected by the Coriolis effect.

29. Compare the climate in NY and SF. Why are they different?
Prevailing winds- SF gets weather from over ocean- high specific heat- so moderate climate.
NY gets its weather from over land- more fluctuation (large temp range) Similar altitude and latitude and both are close to the ocean.

30. Location C most likely experiences **low**/**high** pressure and **low**/**high** precipitation (circle the correct terms) Explain why.
See the diagram before Question #33.

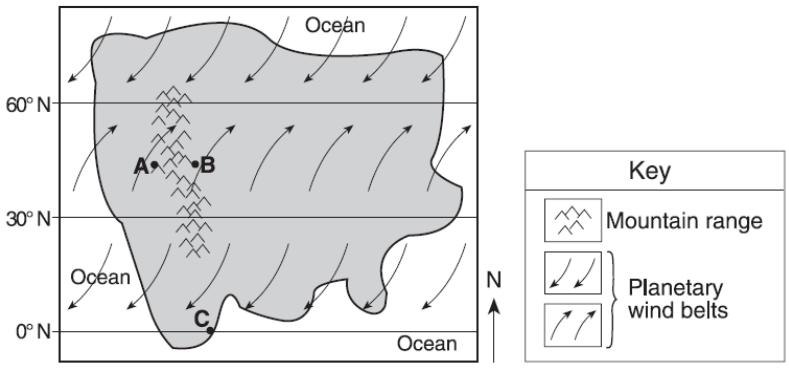


(Not drawn to scale)

31. The diagram above shows Earth in its orbit around the Sun. Positions A, B, C and D represent Earth at the beginning of each season. Label the first day of spring (vernal equinox), first day of fall (autumnal equinox), the first day of winter (winter solstice), and the first day of summer (summer solstice).

32. Which ocean current transports warm water away from Earth's equatorial region? Use the Map of Surface Ocean Currents to answer this question.
    (a) Brazil Current
    (b) Guinea Current
    (c) Falkland Current
    (d) California Current

Base your answers to the next two questions on the map below, which represents an imaginary continent. Locations A and B are on opposite sides of a mountain range on a planet similar to Earth. Location C is on the planet's equator.



33. Compare the climate at location A to that at location B.
Location A- wetter, colder, air rising *Location B- dryer, warmer, air descending*

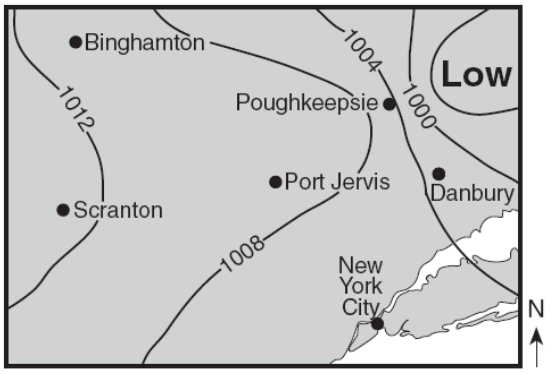
34. Gas laws: Which of the following have direct relationships?
Circle all that apply: volume and temp volume and pressure temperature and pressure

35. A sample of gas occupies a volume of 150 mL at 298 K, what volume will it occupy at 398 K?
V1T2=V2T1
150 ml x 398 K = 298 K x V2
V2= 200.3 ml

36. A balloon has a volume of 3 L at a temperature of 24°C. What will its volume be if the temperature changes to -15°C?
V1P2=V2P1
• convert temperatures to Kelvin (add 273)
• 3L/297K = V2/288K
• V2 = 2.9L

37. The volume of a gas is 1 L when the pressure is 4 atm. What will the volume be if the pressure changes to 8 atm?
P1V1 = P2V2
(4atm)(1L) = (8atm)(V2)
V2 = 0.5L

Base your answers to the next couple questions the weather map below, which shows a low-pressure system located near Poughkeepsie. Isobars shown are measured in millibars.



38. Which city is most likely experiencing winds of the greatest velocity? Why?

Poughkeepsie will have the highest winds because the isobars are close together (Differences in pressure)

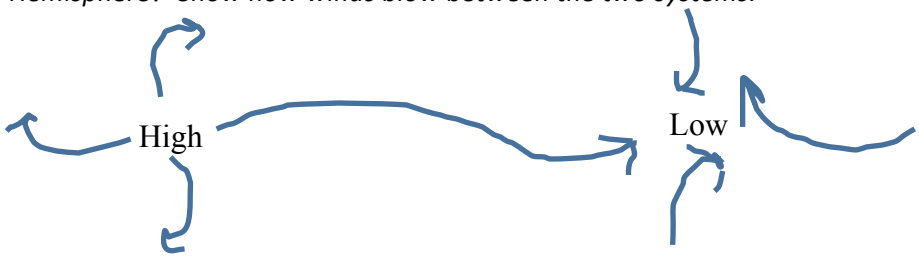
39. Surface winds are most likely blowing from what direction?

Winds would be out of the west/south west (toward the low)

40. What happens to air/water at the Poles? At the Equator?
Poles- cold, sinks
Equator- warm, rises

41. If Earth's axis were tilted LESS than 23.5°, what would happen to the temperatures in California?
Our summers would be cooler and our winters warmer. (less seasonal variation)

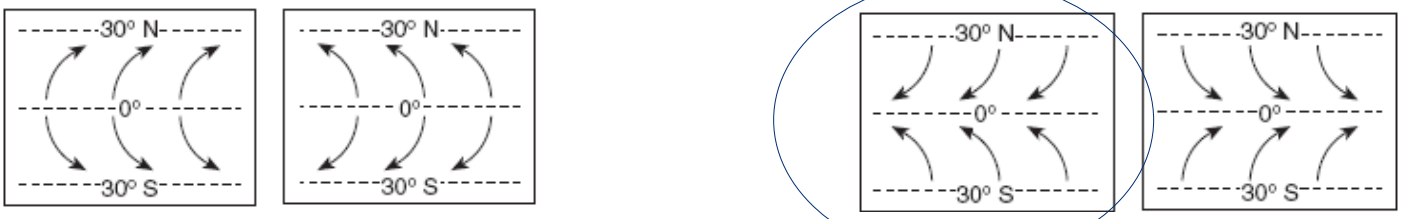
42. Draw a diagram of the surface wind pattern associated with high-pressure and low pressure systems in the *Northern Hemisphere? Show how winds blow between the two systems.*



43. Explain why large oceans moderate the climatic temperatures of surrounding coastal land areas.
Because water has a high specific heat, it does not change temperature quickly.

44. What letters represent air masses that normally form just south of the United States over the Caribbean Sea?
Circle one: **mT** **mP** **cT** **cP**

45. Which map best shows the surface movement of winds between 30°N and 30°S latitude? Circle the correct one.



46. What are 3 major factors that cause/influence winds and their direction?

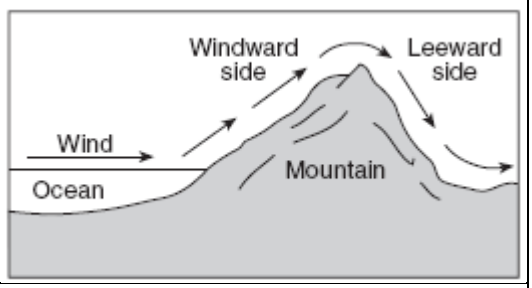
Density, Temperature, Pressure, Coriolis effect (rotation of earth)

47. What is most important in determining the properties of an air mass?
Area over which it formed(warm ocean or warm land, etc)

48. Which type of air mass is associated with warm, dry atmospheric conditions?
Circle one: **mT** **mP** **cT** **cP**

49. The cross section to the right shows the flow of winds over a mountain ridge. The heaviest rainfall would most likely occur on which side of this mountain and in which type of air mass?

There would be more rain on the windward side of the mountain. Air would rise (low pressure) and create clouds on the windward side. Maritime Tropical or maritime polar.



50. What causes ocean currents? What affects their direction?

Wind, Planet rotation (clockwise in N hemisphere) , Density of the water (depends on temperature and salinity) , Gravitation of the moon and earth

51. What two variables are shown in a Climatogram?

Temperature and Precipitation