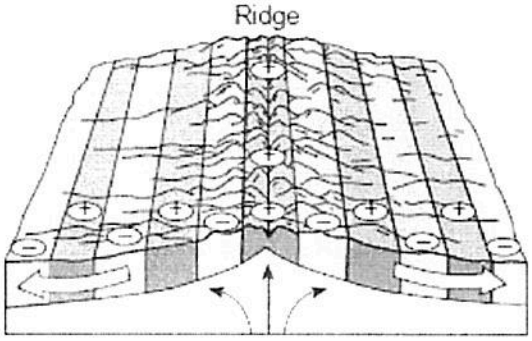
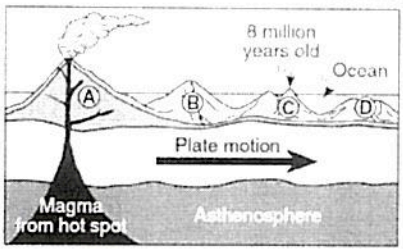
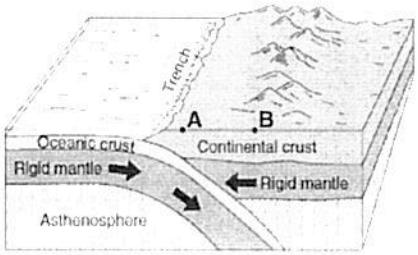
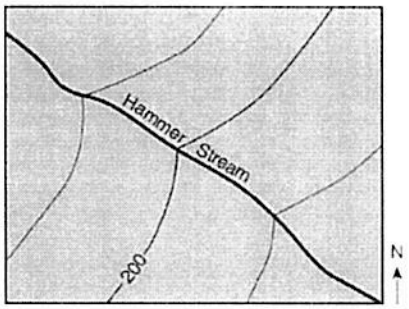
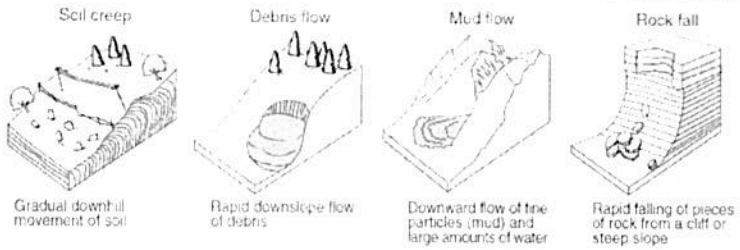
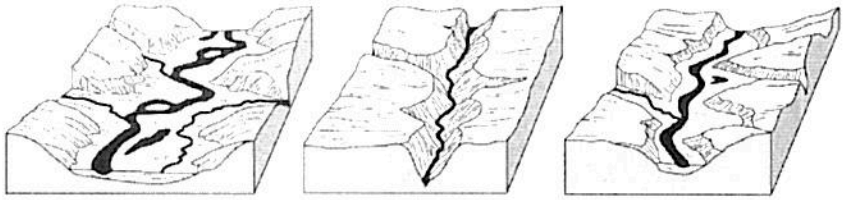
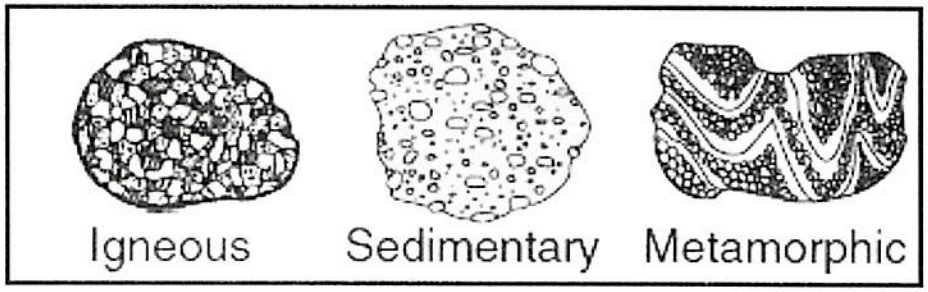
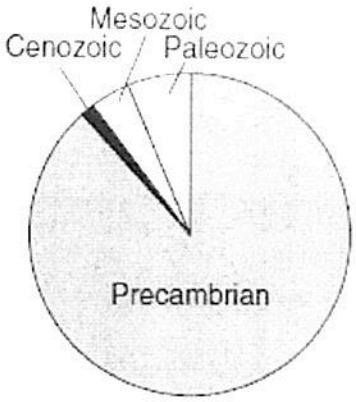
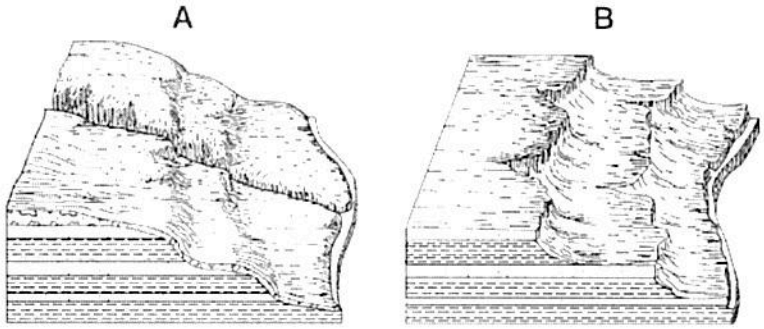
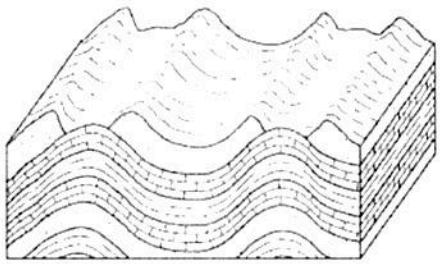
Really Important Diagrams & Concepts to understand for the Earth Science Regents Exam

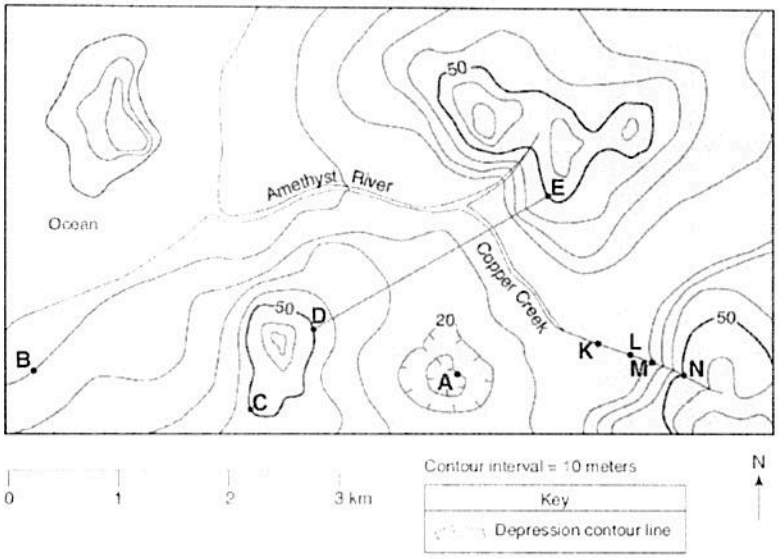
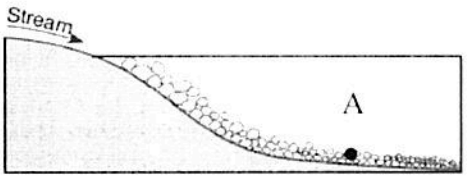
GEOLOGY, GEOMORPHOLOGY, & GEOGRAPHY:

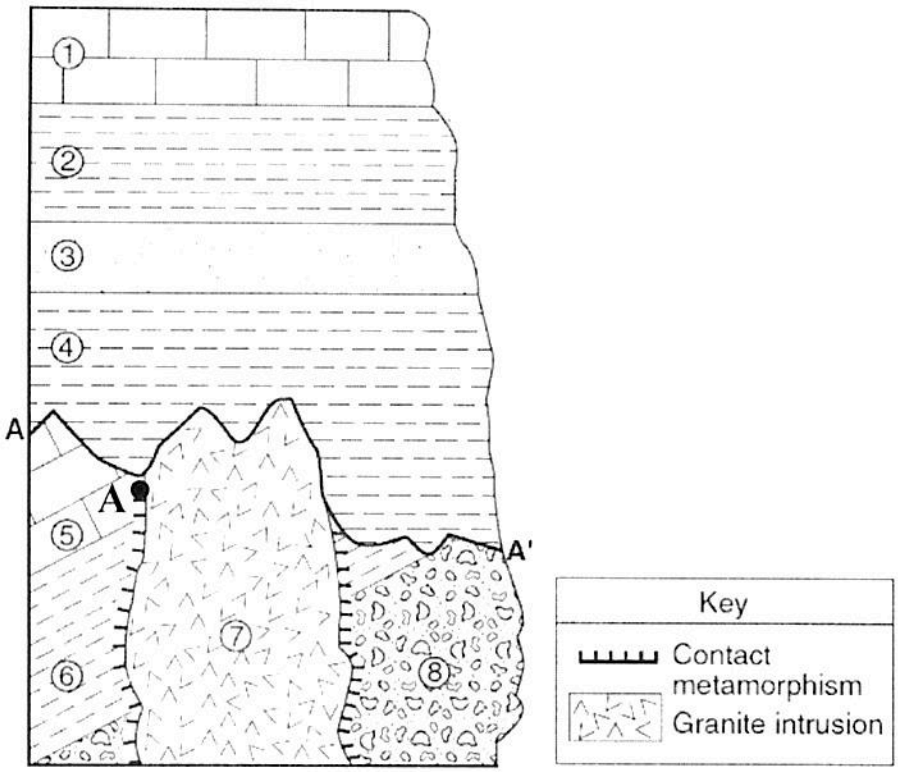
 1. What landform is found at point X, where the Mississippi River enters the Gulf of Mexico?	Delta
2. Notice the Great Lakes are not part of the Mississippi Drainage Basin, what body of water do they drain into?	St. Lawrence River → Atlantic Ocean
3. Since the Ohio, Missouri, and Arkansas Rivers all flow into the Mississippi, they are considered _____.	Tributaries
 4. How does the age of the seafloor compare on either side of the ridge?	Age increases as you get farther from the ridge. Symmetrical. Mirror image on either side of the ridge
5. What do the "+" and "-" signs refer to?	+ : normal polarity - : reversed polarity
 6. What kind of landscape region is this?	Plateau: raised / elevated sedimentary rock structures

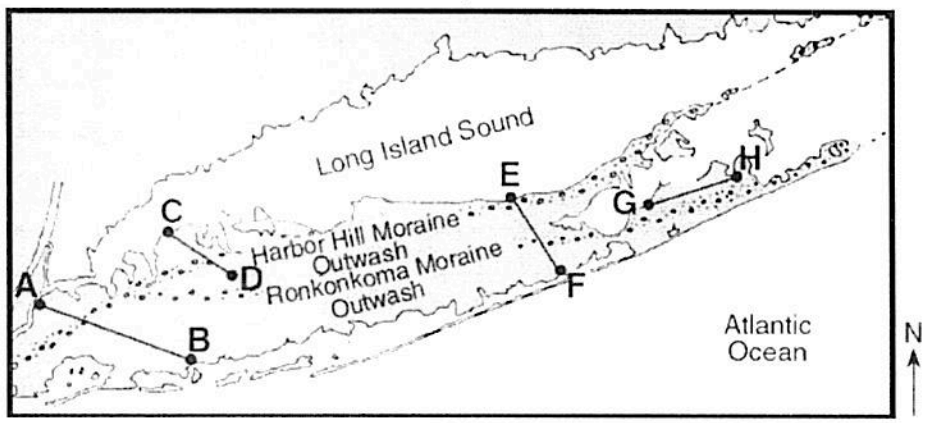
 7. List the volcanic islands in order of increasing age.	A, B, C, D
8. What is a possible age of island B?	Less than 8my
9. Name a chain of islands that has formed in a similar way.	Hawaii, Canary's, or Galapagos
 10. Compare the density of the oceanic crust to continental crust.	Oceanic crust is more dense
1. What kind of plate boundary is this?	Subduction zone, convergent
12. Describe the relative motion of the tectonic plates here.	Toward one another
13. What kind of lava will be extruded from the volcanoes that form here? (felsic, mafic, or andesitic)	Andesitic
14. Where in the Americas is this happening?	West coast of S. America (the Andes Mts)
 15. Which way is Hammer Stream flowing? Explain.	bend SE. Contour lines point up hill as they cross a stream

 16. What is the name for this category of erosion?	Mass movement
17. Why is this considered erosion & not weathering?	Sediment is being moved
18. What controls the speed of the sediment?	Slope of the land
 19. What are the names for the stages of this streams development?	Diagram A: Old Diagram B: Young Diagram C: Mature
20. Compare the velocity of the stream in diagram A to Diagram B?	A is fast, B is slow
21. If a glacier were to advance into the valley of Diagram B, how would the shape of the change?	Become more U-shaped
 22. What is the method (process) of formation for each type of rock?	Ig: solidification Sed: compaction & cementation Meta: heat & pressure
23. If they were drawn to actual size, what is the texture of the Each rock?	Ig: coarse / non-vesicular Sed: clastic Meta: foliated
24. If they were drawn actual size, is the igneous rock intrusive or extrusive? Explain.	Intrusive, big crystals coarse

 25. How long ago did the Precambrian Eon begin?	4,600 mya
26. How many millions of years ago did the Paleozoic Era begin?	542mya
27. Approximately how long have humans been on Earth?	1.8my
28. What event marked the boundary between the Mesozoic and the Cenozoic?	Extinction of dinosaurs
29. List the Periods that make up the Mesozoic from most recent to most ancient.	Cretaceous, Jurassic, Triassic
 30. What evidence in the diagram suggests that "A" is a humid region & "B" is an arid region?	B has rounded hill sides
 31. Were the rock units formed in this pattern?	No
32. What kind of tectonic forces could produce a landscape like this?	Compression / convergent
33. Were these rock units folded, faulted, or tilted?	Folded

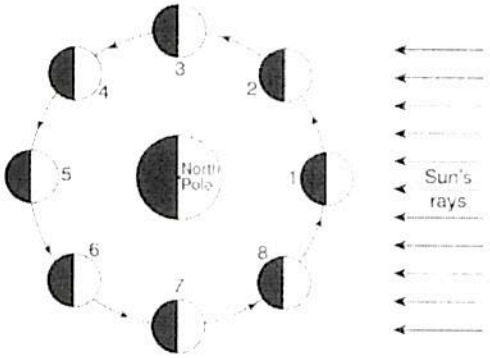
 34. How do you know copper creek is flowing faster between points N & M, than between points L & K?	Lines close together
35. What is the elevation for point A?	10 meters
36. What is the highest possible elevation for the island in the NW corner of the map?	29 meters
37. What is the distance between points D & E?	~2.5km
38. Calculate the gradient between points B & C.	40m/2km = 20m/km
 39. Why are the sediments sorted as shown in the diagram?	Velocity of the water slows down as it enters a lake
40. If the size of the sediment at point "A" is 0.02 centimeters, how fast was the current there?	~ 1cm/sec



41. List the eight rock units in order from oldest to youngest	Oldest: 8 6 5 7 4 3 2 Youngest: 1
42. What is line A – A' called?	Unconformity
43. What kind of rock would be found at point A?	Marble / hornfels
44. If layer #4 was formed during the Ordovician, which trilobite index fossil might be found within that rock unit?	"B" – Cryptolithus
Map  45. Describe the differences in sediment between the Moraines and the Outwash.	Moraine sediment: Unsorted. Sub angular Outwash sediment: Sorted, well rounded
46. Approximately how long ago was the glaciation period that produced these moraines?	20,000 – 5,000 years

ASTRONOMY:

Darkness is shaded.



(Not drawn to scale)

47. Draw what an observer would see if the moon were at positions 3, 6, 8, & 2.

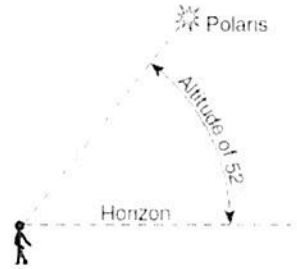
3 1st Quarter

6. Waning Gibbous

8. Waning Crescent

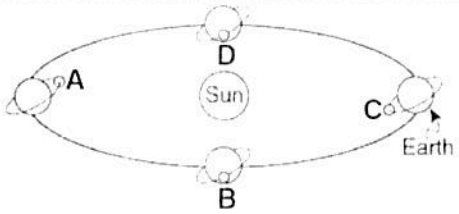
2. Waxing Crescent

48. Which position is the new moon?	1
49. Which position is the full moon?	5
50. How long does it take for the moon to travel once around the Earth?	27.3 days
51. How long is a complete cycle of phases?	29.5 days



52. What is the latitude of this person?

52°N

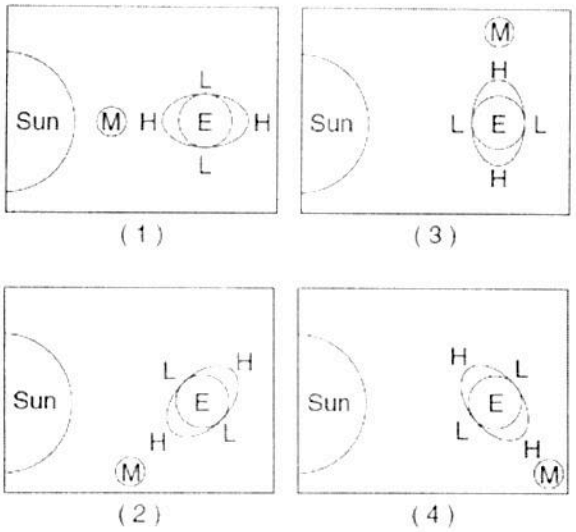
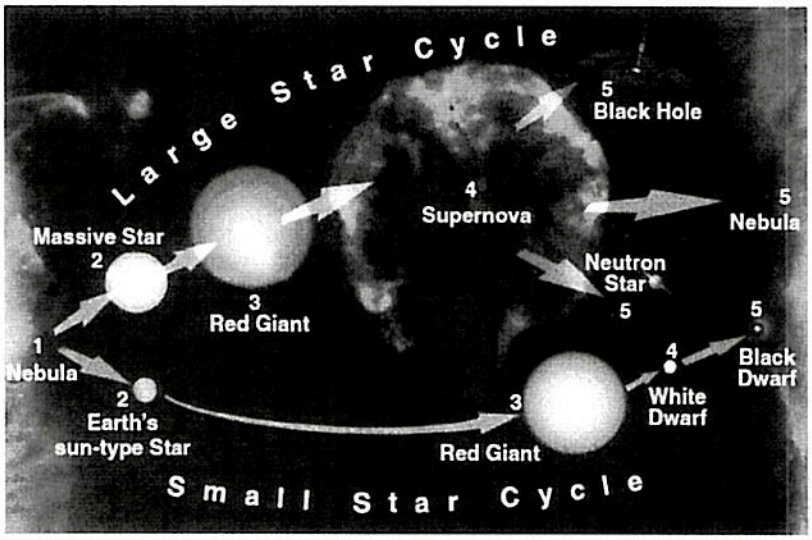


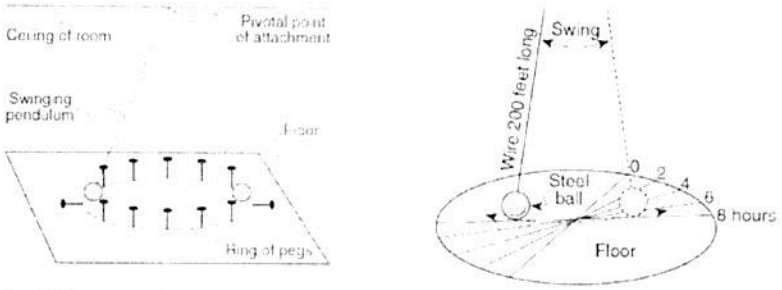
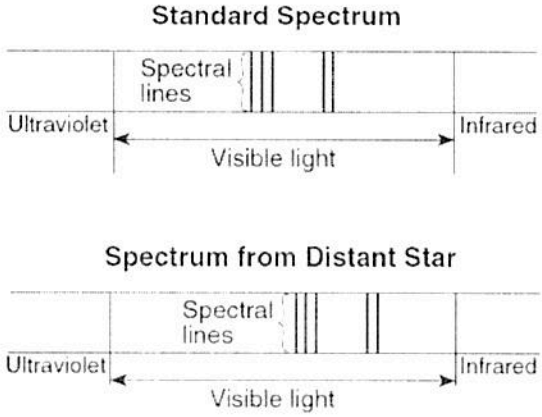
(Not drawn to scale)

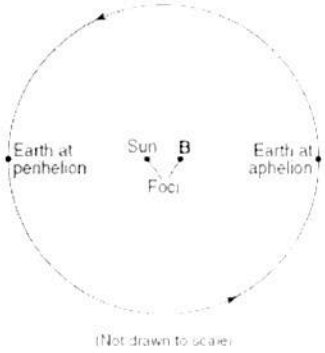
53. In which position could a lunar eclipse occur? Solar Eclipse?

Lunar: B

Solar: D (you could argue A & C)

 54. Describe the tidal range for diagram 1.	High tides is exceptional high and low tide is exceptionally low (great tidal variation) – Spring tide
55. What is the special name given for the tidal range in diagram 3?	Neap tide
56. Why does the moon have more influence on the tides than the sun?	The moon is closer to the earth
57. Approximately how much time is there between consecutive high tides?	Almost 12½ hours
The Life Cycles of Stars  58. What is the fate of our sun?	Red Giant → White Dwarf → Black Dwarf
59. What property of a star determines which path it will follow?	Mass of the Hydrogen gas condensing in the nebula
60. Compare the temperature of a red giant to the temperature of a white dwarf.	White Dwarfs are hotter, red giants are cooler
1. Position #2 on the diagram represents what stage of a star's life?	Main Sequence

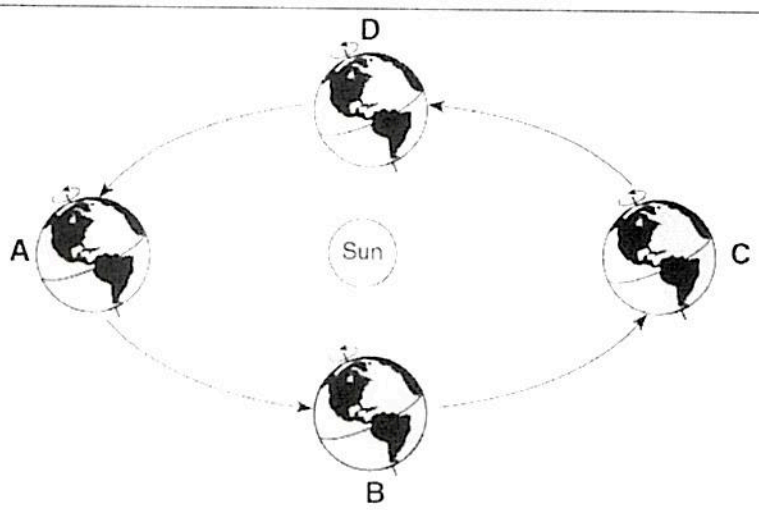
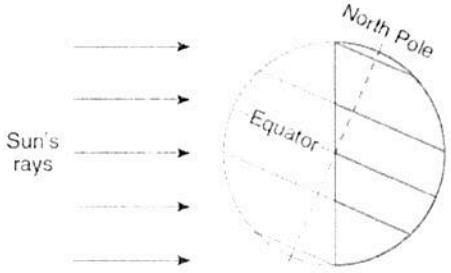
62. What is the name of the reaction that generates light & energy in all stars?	Nuclear Fusion
 63. The pendulum is used to prove which motion of the earth?	Rotation
64. At the north pole what would be the rate at which the pendulum appears to change direction? At the Equator?	N. Pole: 15°/hour Equator: None
 65. What was the relative motion of this star compared to the observer?	The star is moving away.
66. What was inferred when the same results were noticed by analyzing spectrum from galaxies?	The universe is expanding
67. What is the name of our galaxy? What is its shape?	Name: Milky Way Shape: Spiral

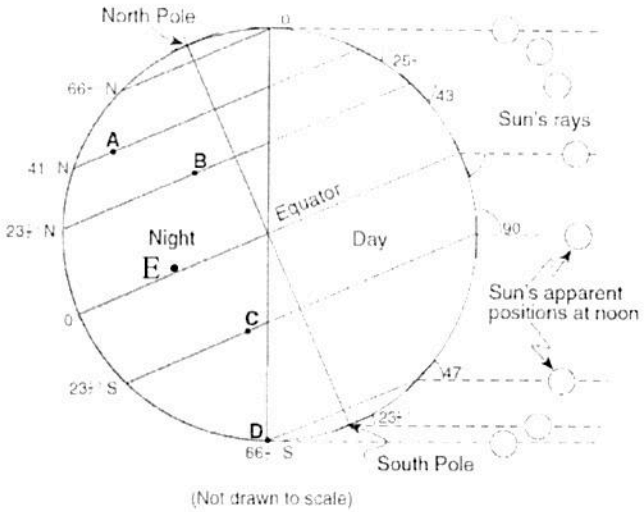
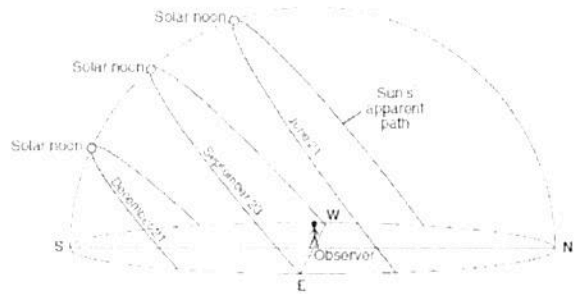


68. Describe the gravitational force on Earth, orbital velocity of Earth and the apparent diameter of the Sun at perihelion & aphelion.

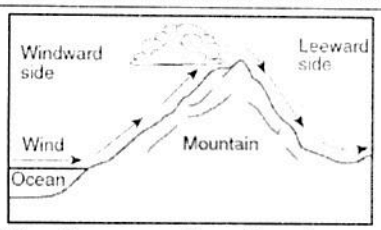
	Perihelion	Aphelion
Gravitational Force:	Strong	Weak
Orbital Velocity:	Fast	Slow
Apparent Diameter of the sun:	Big	Small

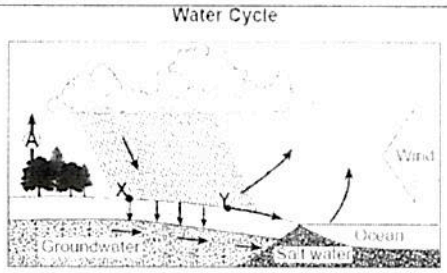
SEASONS & INSOLATION:

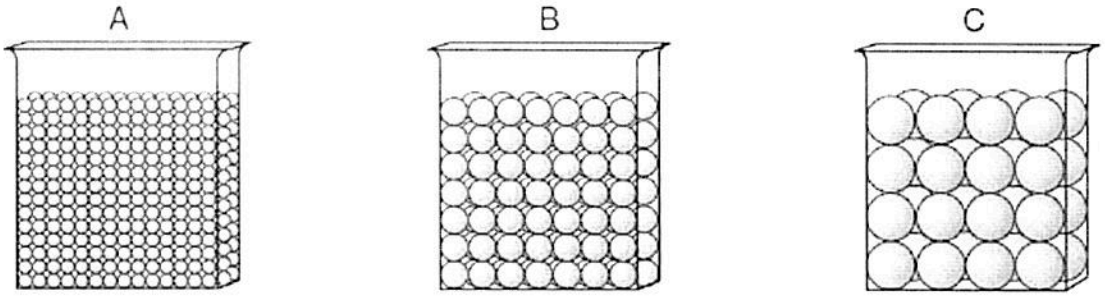
 (Not drawn to scale) 69. What are the dates for each position?	A: dec 21st B: march 21st C: june 21st D: sept 23rd
70. How many complete rotations does the earth make during one complete trip about the sun (orbit)?	365.25
71. In which position is Earth the greatest distance from the sun?	C
2. What is the approximate local time for New York City for all four positions?	A: 6Am B: 12Am / midnight C: 6Pm D: 12Pm / Noon
73. In what direction would an observer in NY have to look to see the sunrise for all four positions?	A: SE B: E C: NE D: E
 74. What is the date represented? What season is it in NY?	Date: Dec 21st Season in NY: Winter
75. What latitude is receiving the most direct insolation?	23.5°S / Tropic of Capricorn
76. In 3 months, how will the intensity of insolation change for NY?	Stronger

 (Not drawn to scale) 77. Compare the length of day for points A, E, & C.	A: Shortest <12 E: exactly 12 hours C: longest >12
78. In 6 months what will the length of day be for location E?	12 hours. Always 12 @ equator
 79. Compare the intensity of insolation for all three sun's paths.	June 21 -- most intense; September 23 – moderate; December 21 – least intense
80. State the direction of sunrise and sunset for all three sun's paths.	June 21 – NE
	September 23 – Due E
	December 21 – SE
81. On which date would the observer cast the longest shadow at solar noon?	Dec 21
82. Which direction would the observers shadow point just after sunrise on December 21st?	NW (opposite the sun)
83. If the person were to travel 10° of latitude closer to the equator, how would the sun's path change?	They would migrate toward the zenith

CLIMATE & GROUNDWATER:

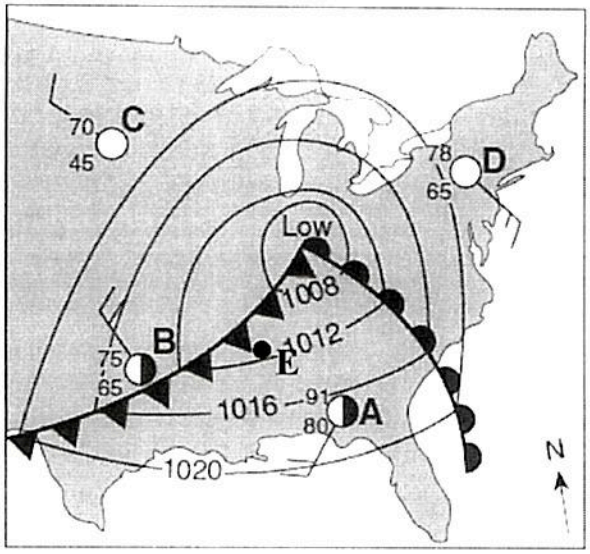


84. Compare the climatic conditions on the windward and leeward sides of a mountain?	Windward: cool & humid; Leeward: warm & arid
85. Explain why the clouds form on the windward side.	Air, rises, expands, and cools! Once @ the dew pt, condensation & cloud formation occurs
 86. What is process "A"?	Transpiration
7. What is the name of the process for the arrow directly under "X"?	Infiltration
88. What is the name of the process for the arrow connected to point "Y"?	Runoff
89. What is the name for the process that created the clouds?	Condensation
90. What is the name for the arrow pointing upward from the ocean?	Evaporation



91. Compare the permeability of A, B, & C.	A is least, C is greatest
92. Compare the porosity of A, B, & C.	A = B = C (all same)
93. Compare the capillarity of A, B, & C.	A is greatest, C is least

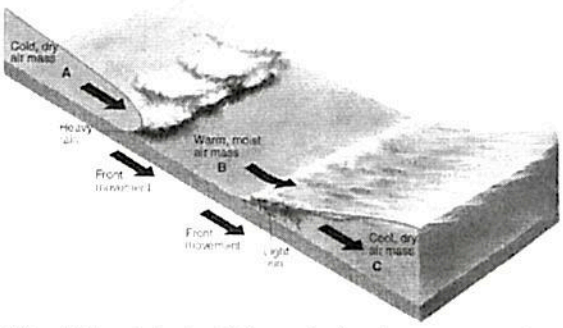
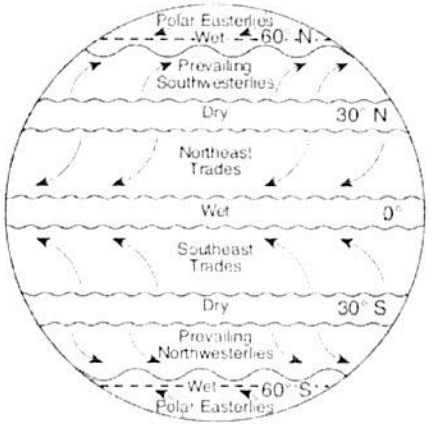
WEATHER:

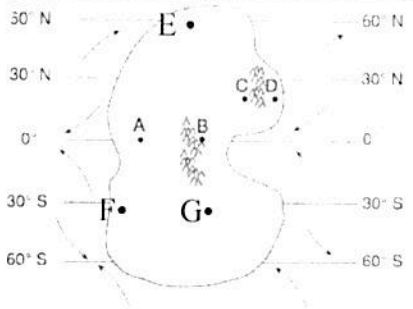
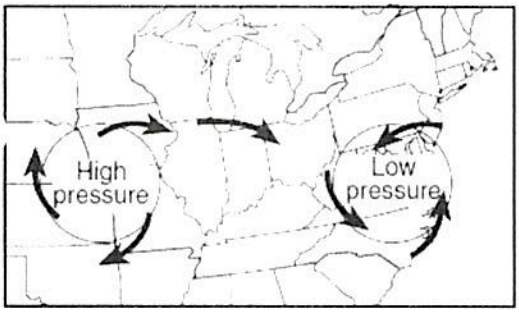
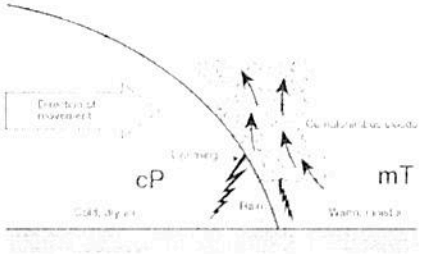


94. What is the Temperature, Dew Pt, Cloud cover, Wind direction, & Wind speed at A, B, C, & D?

	Temp	Dew Pt	Cloud Cover	Wind Dir	Wind Sp.
A	91F	80F	50%	SW	20kn
B	75F	65F	50%	NW	20kn
C	70F	45F	0% Clear	NW	10kn
D	78F	65F	0% Clear	SE	15kn

95. What type of front extends to the southwest of the low pressure system?	Cold front
96. What type of front extends to the southeast of the low pressure system?	Warm front
97. What was the likely source region for the air mass over location A?	Gulf of Mexico
98. If the low pressure system follows a typical path, which location will it likely move toward?	D (SW planetary winds)
99. Make a forecast for point E.	A decrease in temperature, and good chance of rain with possible thunderstorms
100. State a possible atmospheric pressure for location A.	1017mb, 1018mb, or 1019mb
101. Describe the general air circulation around a Low Pressure system.	Convergent & counter-clockwise
102. If the barometric pressure at Station D was reported to be 1013.5mb, where & in what form would that appear on the station model?	O 135 **135** on the upper right side

 103. What kind of front is in the upper left? Lower right?	Upper left: cold front Lower right: warm front
104. What kind of clouds and storm type is often occurs with the passing of a cold front?	Cumulus clouds / thunderstorms
 105. Why do the prevailing winds curve?	Earth is rotating / coriolis effect
106. In which direction are the prevailing winds for NY?	SW
107. What about the circulation of air make the equator "wet" moisture belt?	Air is warm & rising
108. What about the circulation of air makes the poles "dry"?	Air is cold & sinking

 109. Why would the average temperatures for B be lower than A?	B has a higher elevation
110. Why would E have cooler average temperatures than A, B, C, D, F & G?	E has a higher latitude … E is farther from the equator
111. Why would summers at F be cooler than summers at G? And, why would winters at F be warmer than the winters at G?	G is inland, F is coastal
112. When would G have its greatest duration of insolation?	December 21st (S. Hemisphere)
 113. Describe the general circulation of winds around low pressure & high pressure systems in the N. Hemisphere.	Low: convergent & counter-clockwise High: divergent & clockwise
 114. Why do the clouds form on the mT side instead of the cP side?	Warm air is forced up the frontal boundary
115. What process creates clouds?	Condensation
116. What is a possible source region for the cP and mT air masses?	cP: central Canada
	mT: Gulf of Mexico
117. What type of front is this?	Cold Front