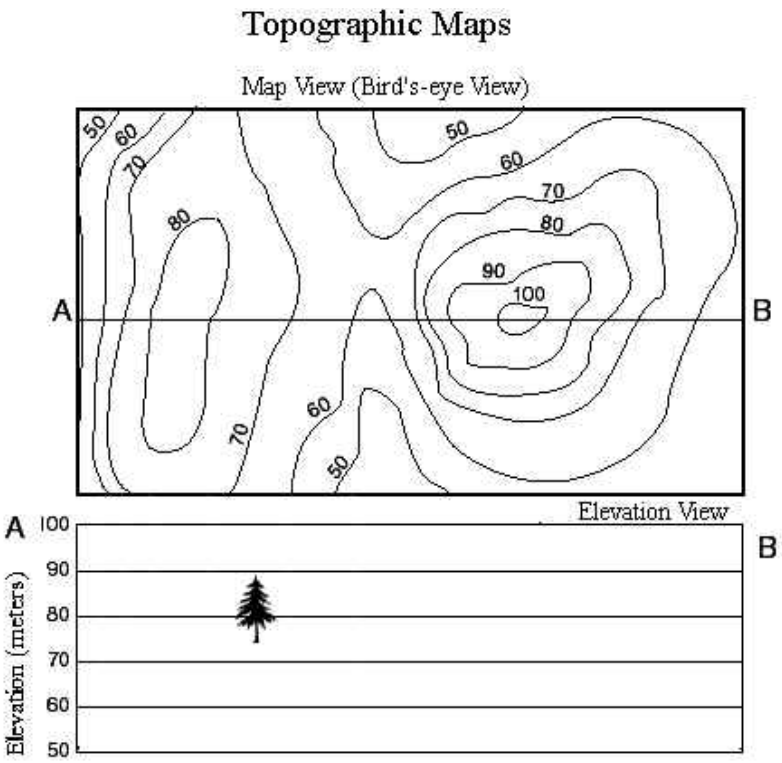
Earth Science Final Exam FORMATIVE ASSESSMENT

Name:_____

Section 1: Scientific Inquiry, Maps, Topography and Literacy

1. Using the topographic map below, make a side view of the land area. Describe the land area's slope—where does it rise fastest and where is there a gentle rise?



2. Put the following steps of the scientific process in order:
   ____ Make a conclusion
   ____ State the problem
   ____Do an experiment and collect data
   ____Analyze the data
   ____Do initial research and make a hypothesis

3. Which is which?

a. Scientific theory	1. educated guess, based on observation
b. Hypothesis	2. explains scientific observations

4. List the four spheres.

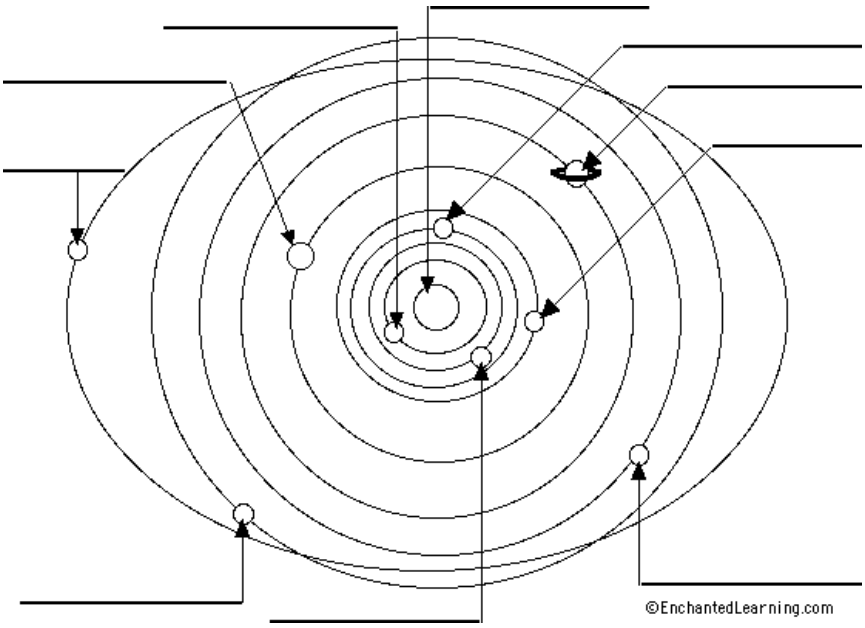
a. _____sphere	the solid, rocky crust covering entire planet
b. _____sphere	composed of all of the water on or near the earth
c. _____sphere	composed of all living organisms
d. _____sphere	the body of air which surrounds our planet

5. What is a system?

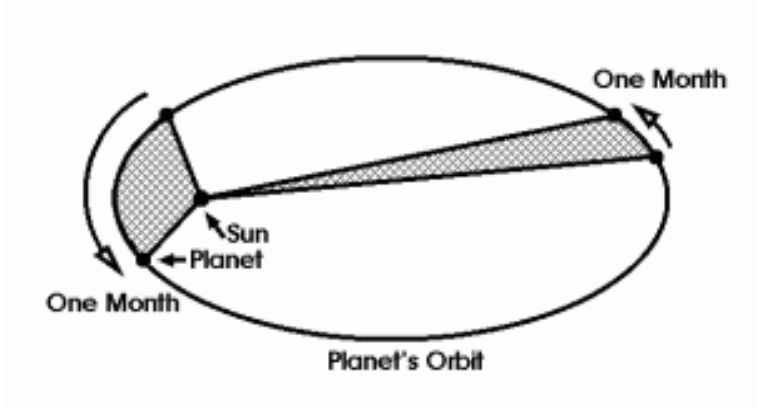
6. Explain how the Earth functions as a system.

Section 2: Astronomy

7. Name the planets on the chart below.



8. What does Kepler's laws tell us about planetary orbits? Use the picture below to explain the movement of the planets in rotation around the sun.



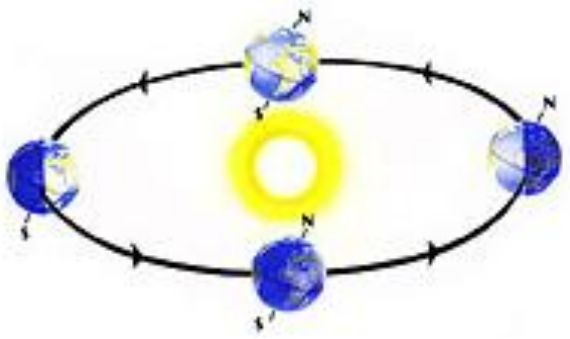
9. How old is the universe? _____ How old is the Earth? _____

10. Is the universe expanding or contracting? Identify two pieces of evidence that support your perspective.

11. What is the theory called that describes how this process started?

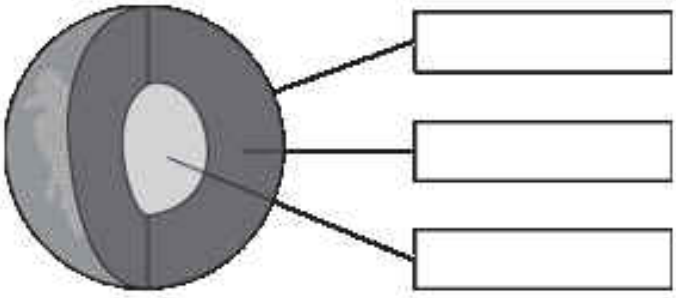
12. The source of the Sun's energy is
    a. Nuclear fusion
    b. Nuclear fission
    c. Photosynthesis
    d. Chemical burning

13. Label the seasons on the picture below. Use the words: spring, summer, winter, autumn, equinox, and solstice.

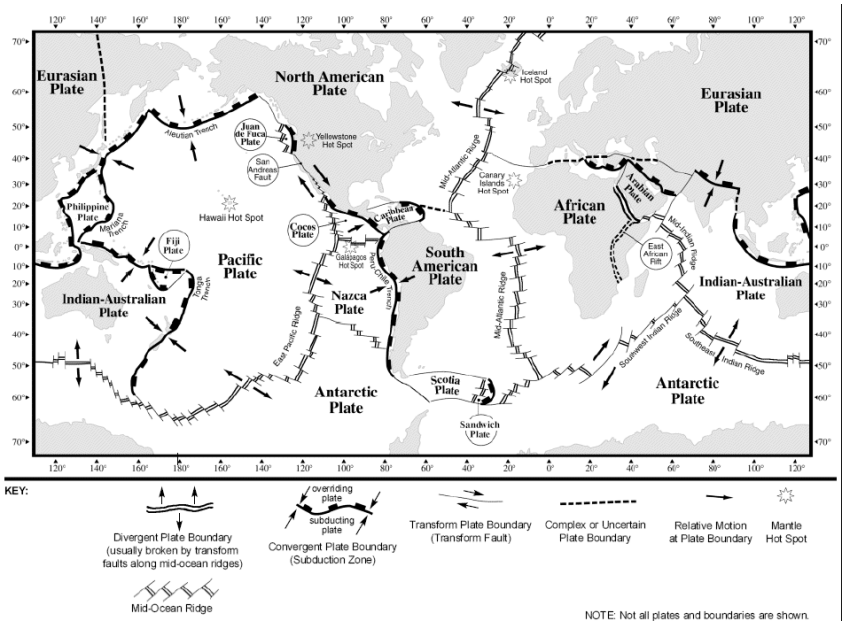


Section 3: Plate Tectonics

14. Label the parts of the Earth. Use the words core, crust and mantle. Where would you find the lithosphere and the asthenosphere?



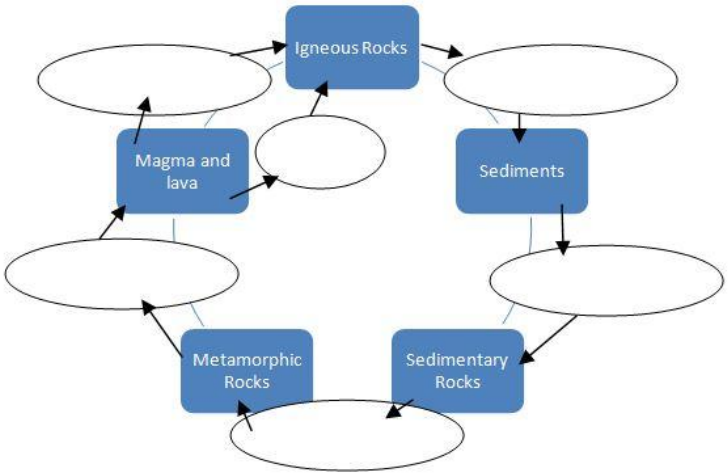
15. On map below, why are there puzzle piece like shapes? Where would you expect to find the most earthquakes?



16. Draw a picture and then describe the convection cycle within the Earth's mantle. How does it move the plates? Is this an example of continental drift or plate tectonics?

17. Why did scientists initially refuse to accept the theory of continental drift?

18. Fill in the chart below using the words in the ovals to describe the rock cycle.



Section 4: Rocks, Minerals and Soils

19. Igneous rocks that cool quickly have (circle one) large OR small crystals.

20. For each of the following, indicate if they are mechanical (M) or chemical (C) types of weathering

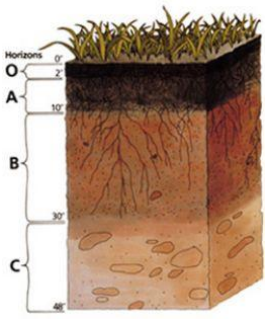
_____ Animal action	_____Acid rain
_____ Abrasion	_____Ice wedging
_____Plant action (roots)	_____Lichens or moss
_____Surface unloading	_____ Oxidation

21. What is the difference between weathering and erosion and deposition? Put them in order of occurrence.

22. Put the following steps of soil formation in order:

_____Parent Material Forms
_____Thick Vegetation Grows And Gives Back To The Soil.
_____Bedrock Disintegrates
_____Organic Matter Begins To Collect

23. Label the soil layers (organic material, humus, bedrock material and match the numbers to the soil layers)



1. Weathered rock R horizon: Patent material
2. Newly added organic materials like leaf litter
3. Soluble minerals (e.g. clay and iron) and organic matter; minerals are deposited
4. A mixture or humus and mineral particles

24. Use the table to answer the questions in the box.

FIGURE 3-16

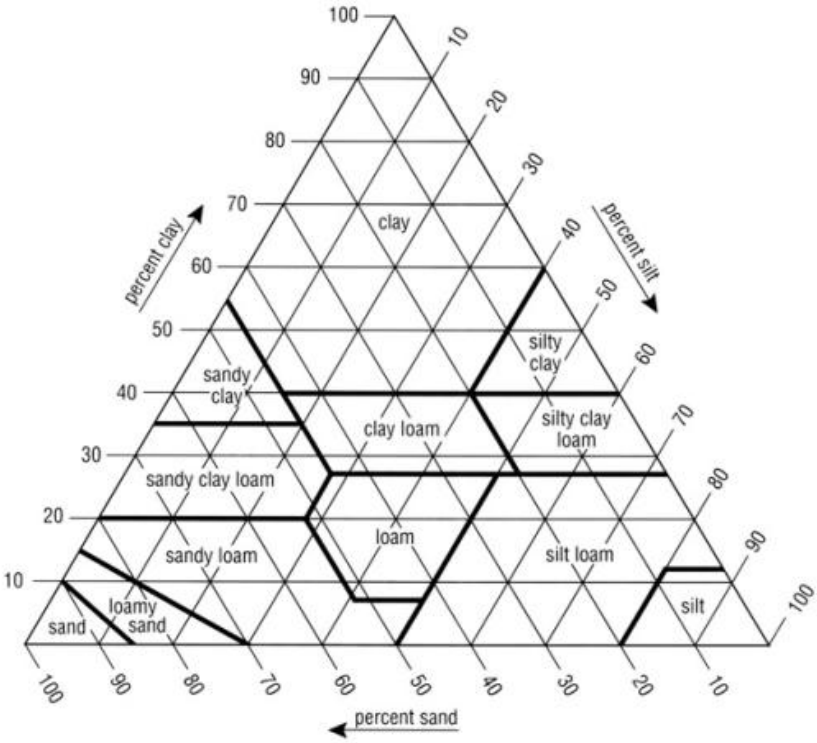


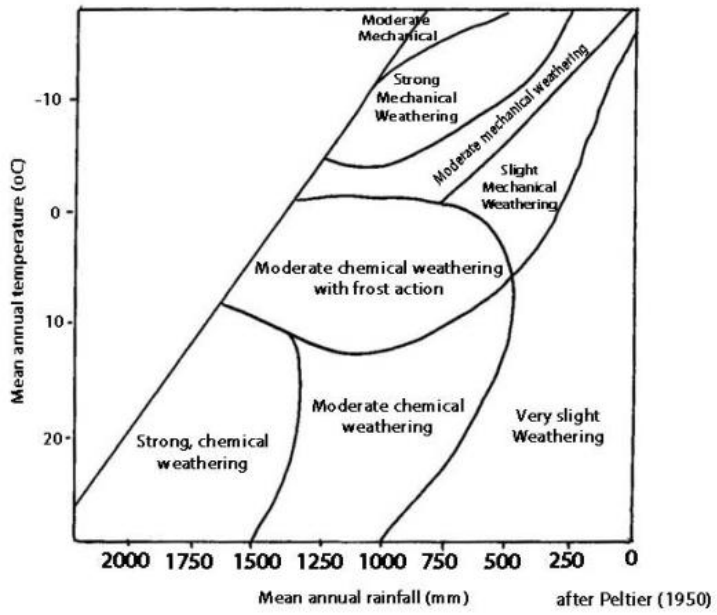
Chart showing the percentages of clay, silt, and sand in the basic textural classes.

1. What kind of soil is 30% silt and 60% clay?
2. What kind of soil is 70% silt and 10% sand?

25. Put the soils in order by porosity (most to least): silt, sand, clay

26. Use the table below to answer this question:

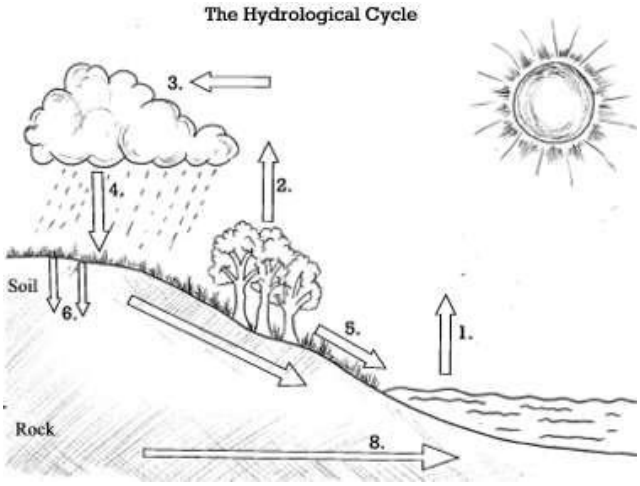
Weathering regions of the world in relation to mean annual temperature and rainfall



1. If the mean annual temperature is -10 degrees C and the area gets 1000 mm of precipitation, what kind of weathering occurs?

Section 5: Freshwater

27. Label the water cycle. Use the words: precipitation, evaporation, condensation, run off, transpiration, infiltration and ground water.



28. Saltwater intrusion most impacts:
    a. Lakes and ponds b. reservoirs c. groundwater d. cropland

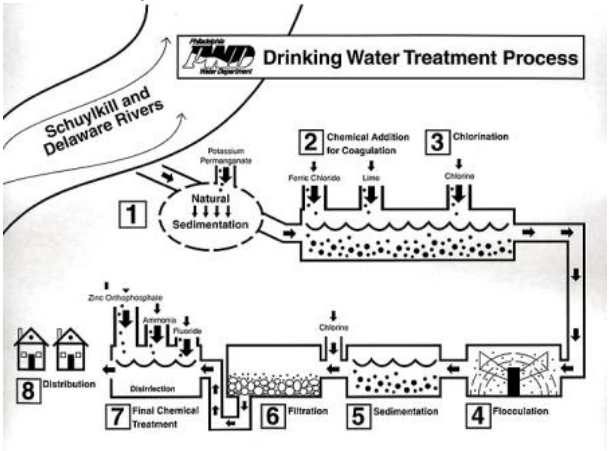
29. Most freshwater is used for
    a. Agriculture b. drinking c. landscaping d. industry

30. For each of the following tests, indicate if it is biological, physical or chemical:

____animal or plant life
____amount of nitrates or phosphates
____amount of oxygen
____color
____sediment
____temperature

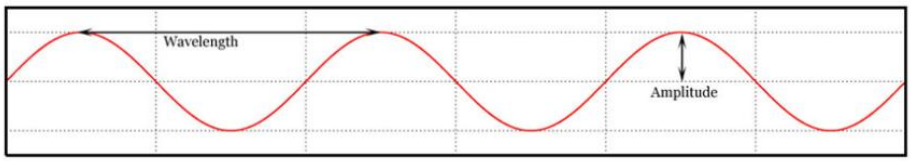
1.
2.
3.
4.
5.
6.
7.
8.

31. List the steps in water treatment:



Section 6: Oceans

32. Label the crest and trough on this wave.



33. What force causes the tides?
    a. The suns' energy
    b. Changes in temperature
    c. Gravitation pull between Earth, Moon and Sun
    d. Winds and Earth's rotation

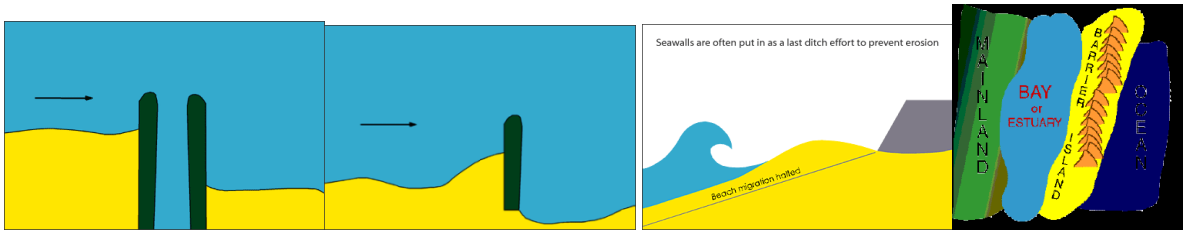
34. Which tide has the lowest lows and the highest highs? **Spring or Neap**
35. Which tide has the least difference between the low and high tides? **Spring or Neap**
36. Which tide occurs at new and full moon? **Spring or Neap**

37. Draw a picture of the Earth, Sun and Moon at Spring and at Neap tide.

38. Which heats up fastest, **land or water?**

39. Which factors impact the motion of the ocean?
    a. Heating and cooling on Earth
    b. Earth's rotation
    c. Rain and Snow
    d. Continent

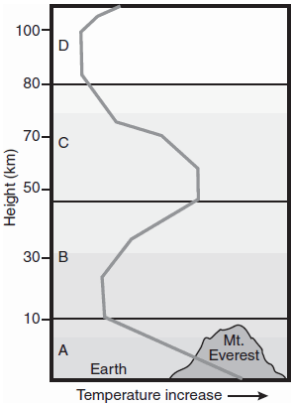
40. Label the following pictures (jetty, groin, sea wall and Barrier Island. What is the purpose of each in protecting the beach?



41. Which kind of current is caused by the wind: **surface or density?**
42. Which kind of current is caused by differences in temperature or salinity: **surface or density?**

Section 7: Atmosphere

43. Label the layers of the atmosphere: strato, meso, tropo and thermospheres)

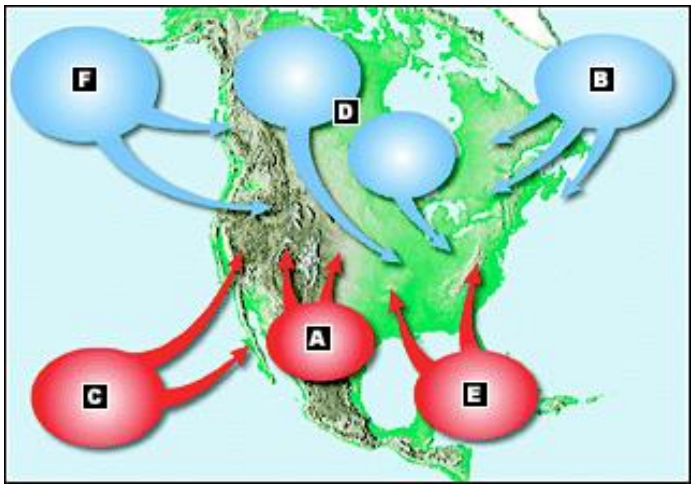


44. What are the main gases and their percent in the atmosphere?

a. _____ c. _____

b. _____ d. _____

45. Label the four main types of air masses on the chart below. Indicate the type of weather to expect with each.



46. Draw the symbol for each of the following types of fronts:

a. Warm

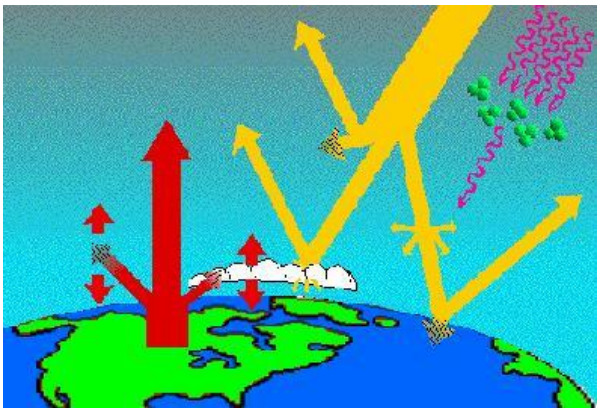
b. Cold

c. Occluded

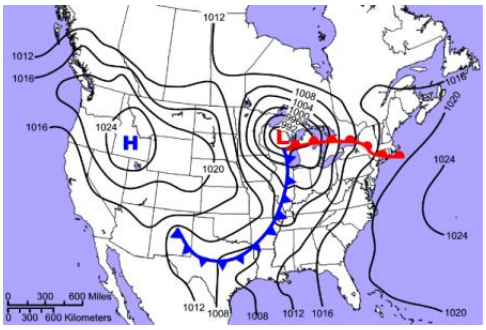
d. Stationary

47. Using the drawing below of a pot of water, label the convection, conduction and radiation ways that heat is transferred.

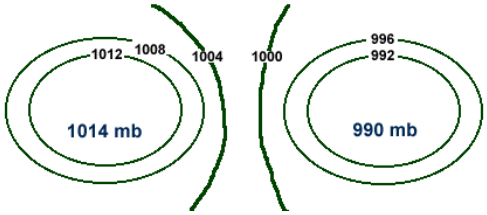
48. Add the amounts of radiation reflected and or absorbed by the Earth, clouds and atmosphere to this picture:



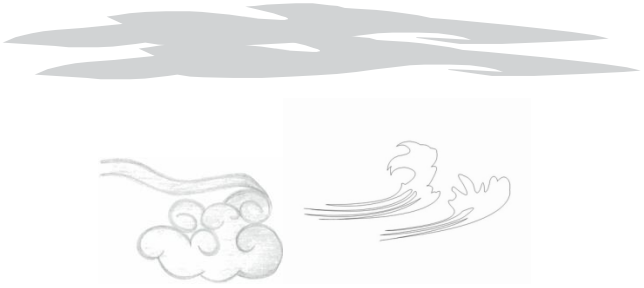
49. On map below, where is wind moving the fastest? Indicate the direction the wind is blowing from the H to the L.



50. Compare and contrast a cyclone and an anticyclone. Which is which? Which way do the winds move? What kind of weather is associated with each?



51. Identify the types of clouds.



52. Pair up the following tools and what they measure:

a. Hygrometer	1. Amount of rain
b. Psychrometer	2. Wind speed
c. Thermometer	3. Air pressure
d. Anemometer	4. Temperature
e. Barometer	5. Relative humidity
f. Rain gauge	6. Humidity

Section 8: Weather and Climate

53. Compare and contrast weather and climate.

54. Which is the windward and which is the leeward side of the mountain in the picture below? Which side would get more precipitation?

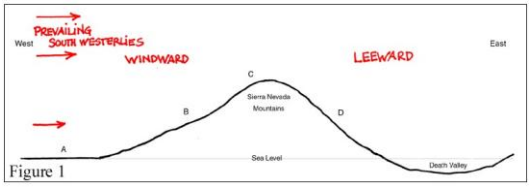


Figure 1

55. What two items determine Koppen climate system zones?

56. **True or False**: El Nino / La Nina is responsible for severe droughts, heavy rains and abnormal weather around the globe.

57. **True or False**: The enhanced greenhouse effect is the warming of Earth's atmosphere due to volcanoes, hurricanes and tropical storms.

58. Fill in the table below using the terms winter solstice, summer solstice, spring equinox and autumnal equinox:

Event	March 21	June 21	September 21	December 21
Northern Hemisphere				
Southern Hemisphere				

59. Which of the following factors affects **climate** (circle all that apply):
    a. Distance to water
    b. Topography
    c. Volcanoes
    d. Global winds
    e. Water currents
    f. Meteors striking the Earth
    g. Elevation
    h. Latitude
    i. Vegetation
    j. Elephants in Africa

60. If the dry bulb temperature is 0 and the wet blub /dry bulb difference is 5 degrees, what is the relative humidity?

61. Do you likely need an umbrella if the dry bulb temperature is 30 and the difference between the wet and dry bub is 1 degree?

Relative Humidity (%)

Dry-Bulb Temperature (°C)	Difference Between Wet-Bulb and Dry-Bulb Temperatures (C°)															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
−20	100	28														
−18	100	40														
−16	100	48														
−14	100	55	11													
−12	100	61	23													
−10	100	66	33													
−8	100	71	41	13												
−6	100	73	48	20												
−4	100	77	54	32	11											
−2	100	79	58	37	20	1										
0	100	81	63	45	28	11										
2	100	83	67	51	36	20	6									
4	100	85	70	56	42	27	14									
6	100	86	72	59	46	35	22	10								
8	100	87	74	62	51	39	28	17	6							
10	100	88	76	65	54	43	33	24	13	4						
12	100	88	78	67	57	48	38	28	19	10	2					
14	100	89	79	69	60	50	41	33	25	16	8	1				
16	100	90	80	71	62	54	45	37	29	21	14	7	1			
18	100	91	81	72	64	56	48	40	33	26	19	12	6			
20	100	91	82	74	66	58	51	44	36	30	23	17	11	5		
22	100	92	83	75	68	60	53	46	40	33	27	21	15	10	4	
24	100	92	84	76	69	62	55	49	42	36	30	25	20	14	9	4
26	100	92	85	77	70	64	57	51	45	39	34	28	23	18	13	9
28	100	93	86	78	71	65	59	53	47	42	36	31	26	21	17	12
30	100	93	86	79	72	66	61	55	49	44	39	34	29	25	20	16

Section 9: Biomes and Ecology

62. For each of these factors, indicate if they are abiotic or biotic:
    a. Water
    b. Plants
    c. Trees
    d. Temperature
    e. Microorganisms
    f. Humans
    g. Soil
    h. Atmospheric gases

63. Draw a triangle with 6 levels and fill each level in with one of the following terms: species, population, ecosystem, biosphere, biome, and community.

64. Contrast biodiversity and genetic diversity. Which has to do with the genes and traits within a population?

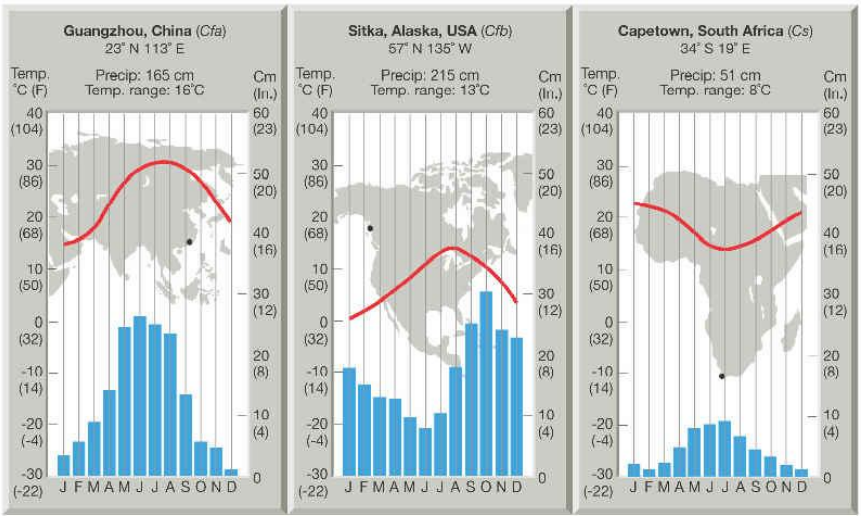
65. **True or false**: Kudzu is an invasive species in North Carolina.

66. **True or false**: invasive species are always bad.

67. **True or false**: photosynthesis is how plants make glucose from the sun's energy while respiration makes energy from chemicals.

68. Describe one way you could do each of the following:
    a. Reduce
    b. Reuse
    c. Recycle

69. Reading the climatograph below,
    a. which location has the highest level of precipitation in June?
    b. Which location has the highest temperatures in January?
    c. Which location has the least change in average temperature from the highest high to the lowest low?



Section 10: Natural Resources

70. What is the definition of sustainability?

71. List 4 ways that humans can live more sustainably.

72. For each of the following types of energy, indicate if they are renewable or non-renewable:
    a. Nuclear fusion
    b. Nuclear fission
    c. Hydrothermal
    d. Wind
    e. Coal
    f. Tidal
    g. Biomass
    h. Natural Gas
    i. Petroleum
    j. Solar

73. Fill in the table below:

Activity	Benefit	Consequence
Living in cities		
Deforestation		
Agriculture		
Aquaculture		