Physical Science Spring Final Review Guide

1. Draw a diagram to show the position of the Earth (include axis) and sun during the N. Hemisphere:
   a. Winter

   b. Spring

2. What times of year do the Sun's rays strike Earth at their northernmost and southernmost positions?

3. On which side are the products in a chemical equation?

4. What is an exothermic reaction? How would this feel on you hand?

5. What is an endothermic reaction? How would this feel on your hand?

6. List three things that are caused by the unequal heating of Earth's surface.

7. What are at least 3 gases are associated with Climate Change?

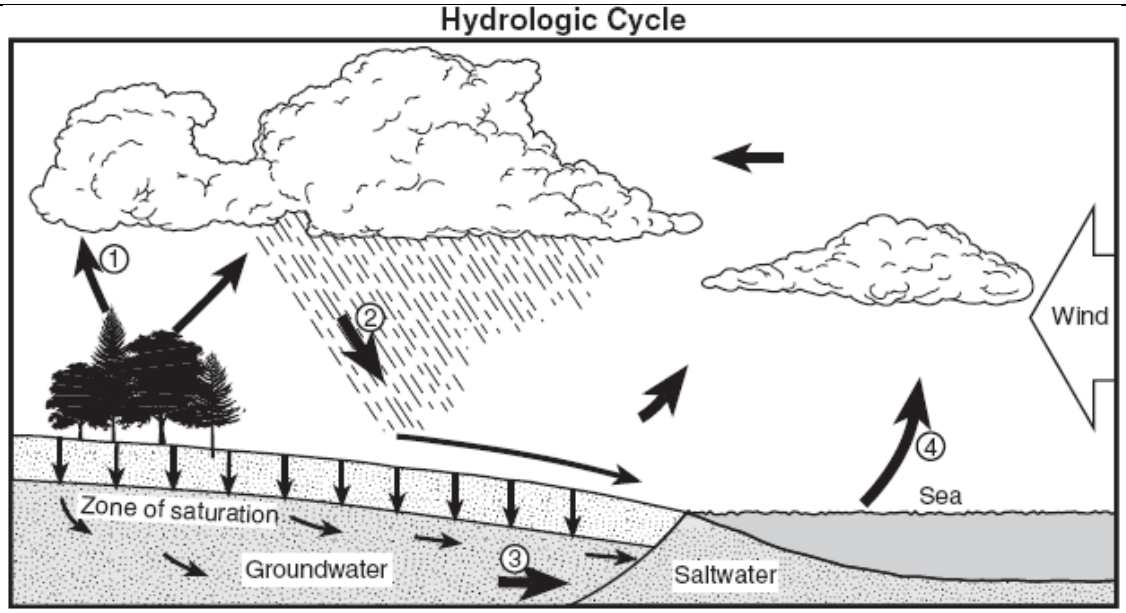
8. What kind of energy transfer does not require matter as a medium?

9. What state of matter has atoms held tightly in place?

10. Describe what happens (in terms of movement of energy) when you touch a piece of ice with your finger.

11. Draw a diagram illustrating the movement of surface winds around a high pressure system in the Northern Hemisphere.

12. Describe how a mountain range can affect climate.

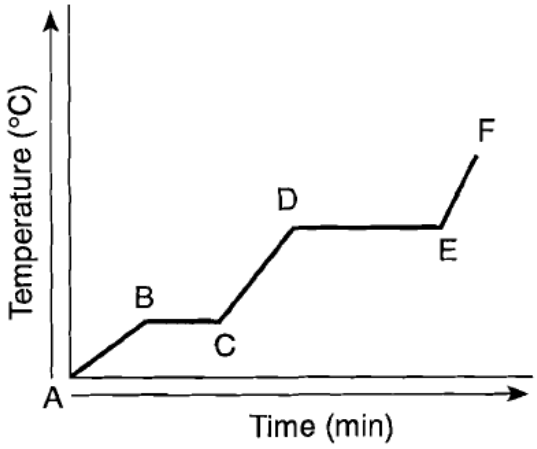


13. Which numbers represent infiltration and transpiration?

14. Why do clouds form?

15. Which numbers could be affected by climate change?

16. For <u>each</u> line segment: Identify the phase/s of matter present and comment on intermolecular forces and energy:



_____

_____

_____

_____

_____

17. In the diagram above, describe what is occuring in the steep vs the flat parts of the curve.
    a. Steep

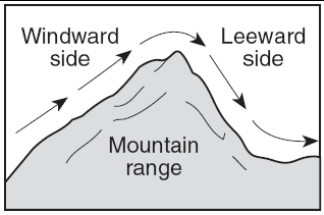
    b. Flat

18. Cool air over the poles will _____. Warm air over the equator will _____.

19. What process transfers energy primarily as electromagnetic waves?

20. What kind of pressure systems do we find near the poles? Why?

21. Describe what is happening to the air as it flows down the leeward side of the mountain range.



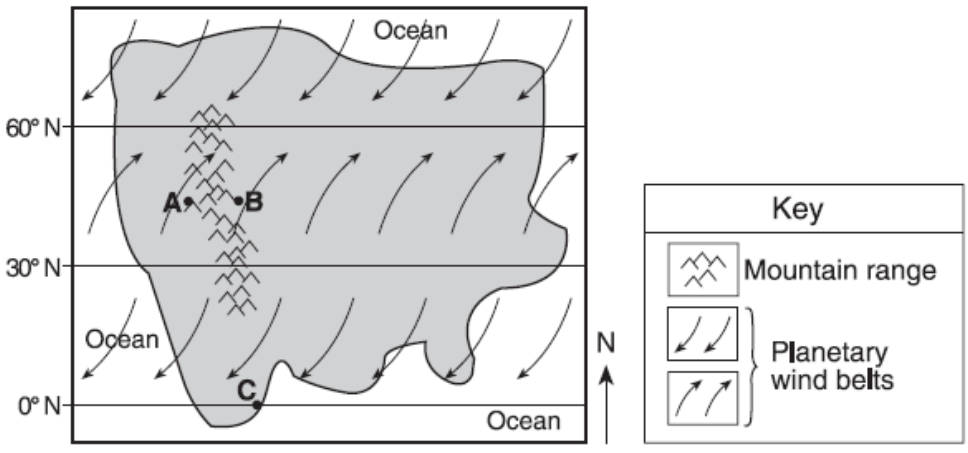
22. Why is the ozone layer important to life on Earth?

23. What is threatening the Great Ocean Conveyor Belt?

24. Where is the ozone layer? Be specific.	25. What causes summer days to be longer than winter days here in Piedmont?
26. Why does it take less time to get a sunburn on a summer day than it does on a winter day? (assuming it is sunny out!)	27. Why is it usually warmer at the equator than it is at the poles?
28. What direction do the prevailing westerly winds move ocean water?	29. As air rises pressure decreases and what happens to its volume? Temperature?
30. What do we call the process of liquid water becoming water vapor?	31. What are 6 factors that affect climate?
32. On a cold day which would feel colder, an insulator or a conductor? Explain.	33. Does latitude have a direct or indirect relationship to temperature?
34. A metal spoon sits in a pot of hot water. Why does the other end of the spoon become hot? Explain what is happening on a molecular level.	
35. Why does a water filled paper cup held in a flame not catch fire?	36. Other than gases, what are 3 other factors that affect climate change?
37. When would you expect onshore winds, in the morning or evening? Why?	38. A substance that heats up slowly has a _____ specific heat.
39. Why do islands experience moderate temperatues?	40. A substance with _____ specific heat warms up very quickly.

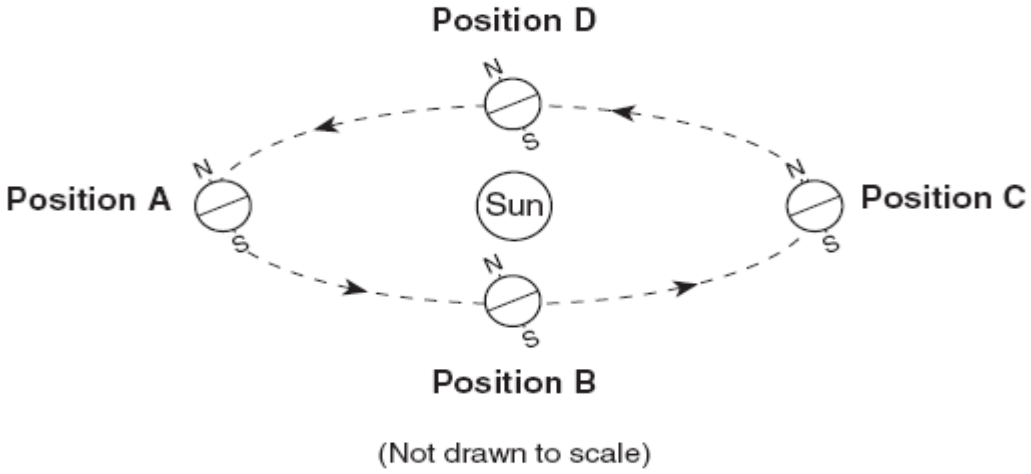
41. Compare the climate at A to that of B.

42. If location C is on the equator, describe the pressure and precipation that area experiences.



43. How would an reduction in surface ice cover affect the amount of solar radiation reflected by the surface of the Earth?	44. Describe a surface that would absorb a lot of electromagnetic energy from the Sun (in terms of texture, luster and color).
45. What causes the Coriolis Effect?	46. Describe a Positive Feedback Loop associated with Climate Change.

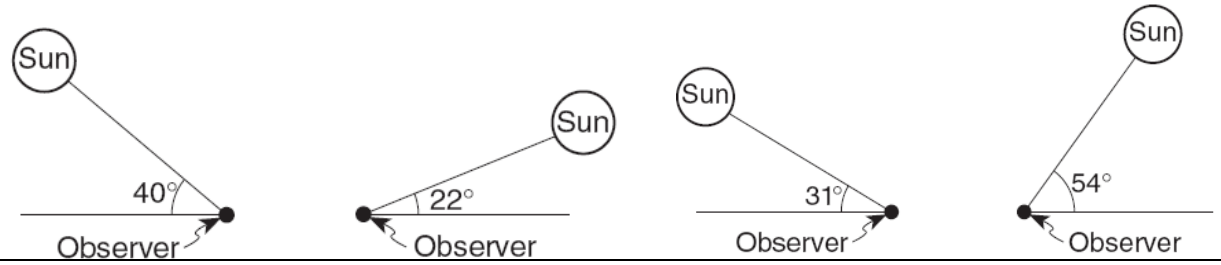
47. Label the seasons on the diagram.



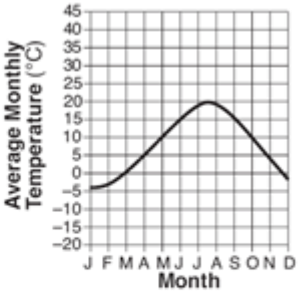
(Not drawn to scale)

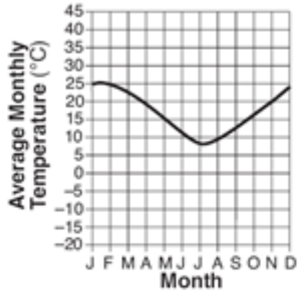
48. Describe the term climate vs. weather.	49. Which type of air mass is associated with warm dry conditions? warm wet conditions? cool dry conditions?
50. What would sprinkling dark sand on snow do to its melting rate? Would white sand have the same impact? Why?	51. Why **doesn't** the ocean mix by convection?
52. What is the Greenhouse Effect?	53. What two variables are shown on a climatogram?
54. What kind of radiation is emited by the Earth?	55. Why **does** the atmosphere mix by convection?
56. What type of EM radiation can we see?	57. Which variable is always plotted on the x-axis? the y-axis?

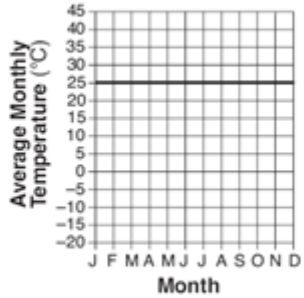
58. In which diagram would the observer experiences the greatest intensity of insolation? the least intense insolation?



59. Describe a location that would have a climate similar to each of the graphs shown below.







60. What is quantitative data? qualitative data?

61. If Earth's axis were tilted more than 23.5°, what would happen to the seasonal average temperatures here in California?

62. Explain law of conservation of energy.

63. Which of the following would change temperature most rapidly? Why?
   a. wood
   b. water
   c. metal
   d. wool

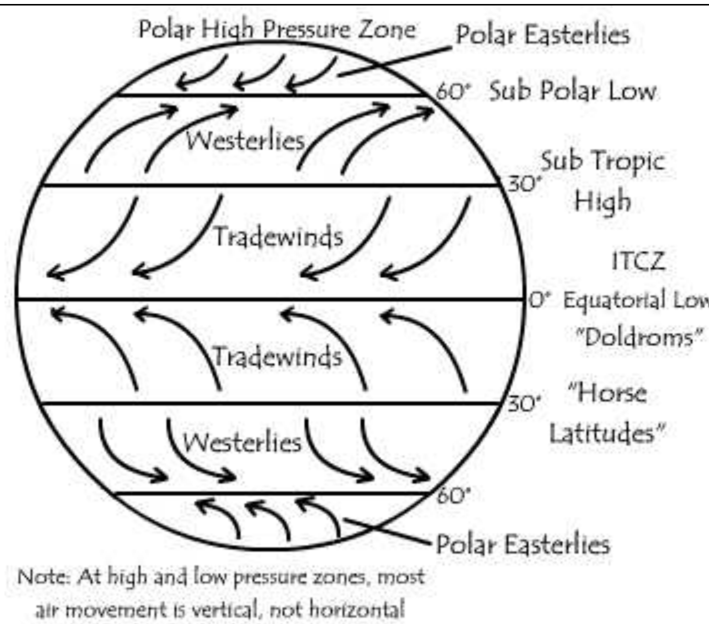
64. Look at the Diagram and answer the following questions.

   a. What are 2 major reasons that we have wind belts on Earth?

   b. Label the horizontal lines on the "globe" as being wet or dry zones.

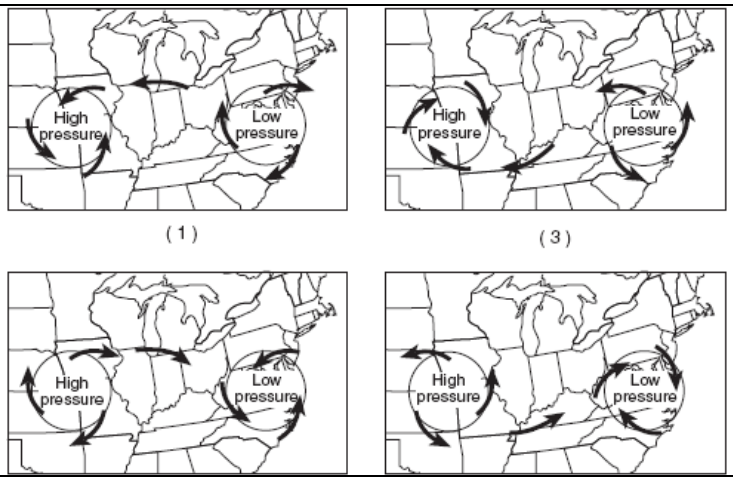
   c. Why would you expect a lot of rain in the areas you labeled "wet" zones?

   d. In general, what is a major difference between winds in the N. verses the S. Hemispheres?

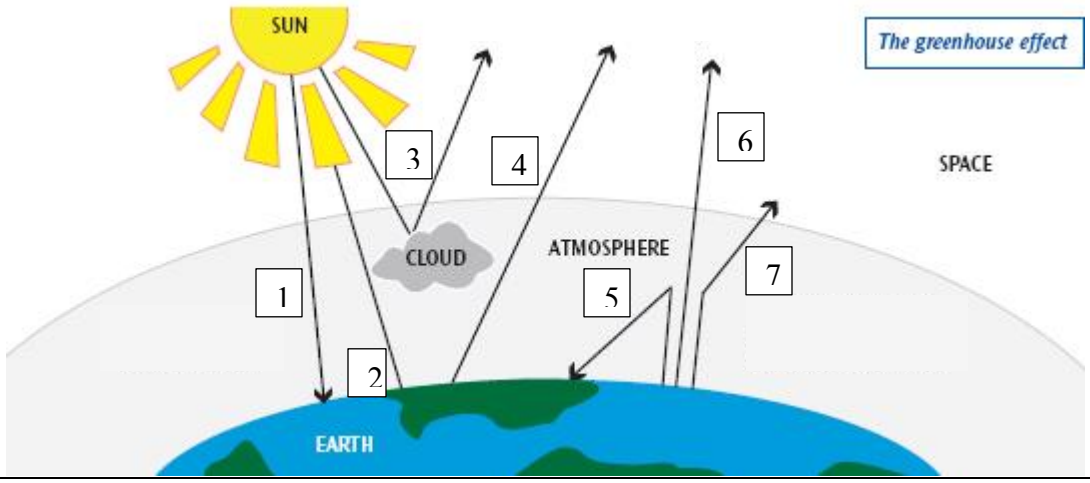


65. What kind of electromagnetic radiation has wavelengths slightly longer than visible light?

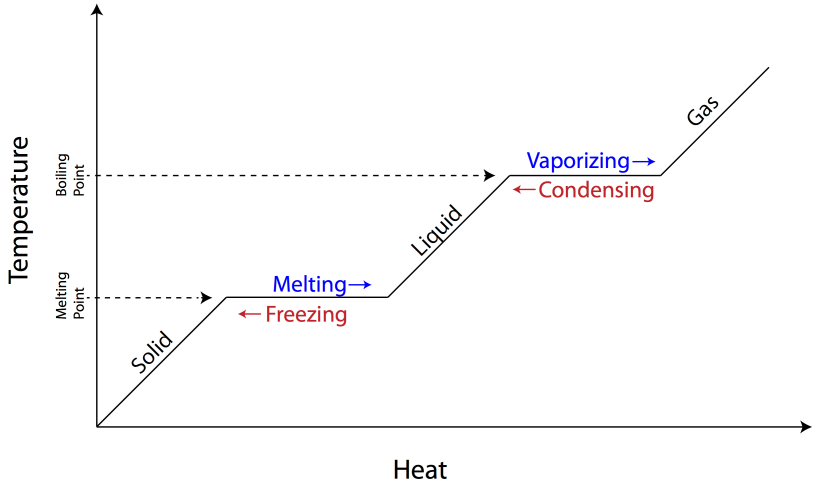
66. Which of the following diagrams most accurately depicts surface wind patterns in the Northern Hemisphere?



67. Label the diagram of the Greenhouse Effect.



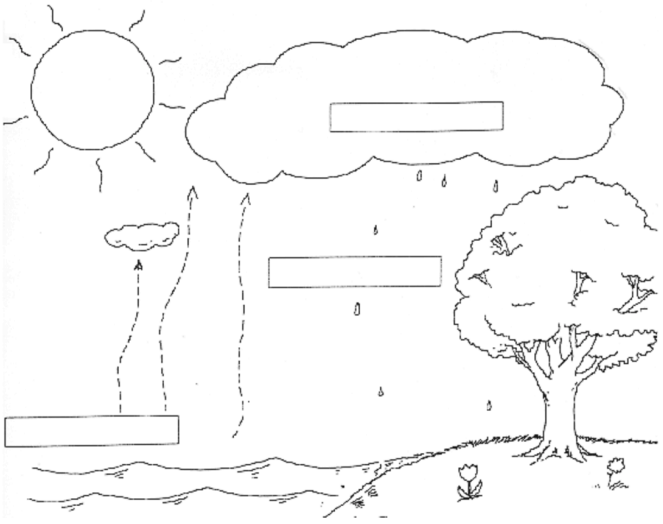
68. Which processes on the graph give off energy? Which require energy?



69. Create a diagram of the Carbon cycle using the terms in the following word bank: photosyntheis, respiration, excretion, decomposition, bruning, volcanic activity

70. Label the following terms regarding the water cycle: condenstion, respiration, tramspiration, evaporation

Highlight and explain which factor is the most significant in terms of global warming:



71. Explain what causes wind.

72. Winds are heat transfer by _____ .

73. What are three types of locations on Earth that would be best for wind farms?

74. Explain why coastal regions are so windy…(be specific)

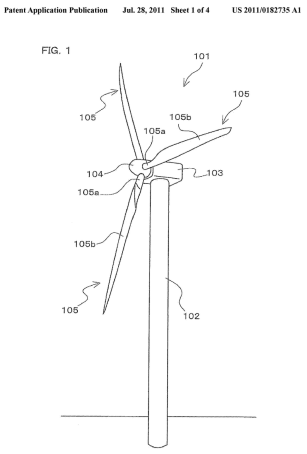
75. Where on Earth do we expect very little wind? Explain why.

76. How are winds named?

77. A doubling of the wind speen can result in _____ times the power produced.

78. Why should wind turbines be placed higher in the sky instead of close to the ground?

79. Label a basic wind turbine



80. What makes wind turbines most effeicient?

81. Be able to discuss the following relationships with regards to wond turbines:

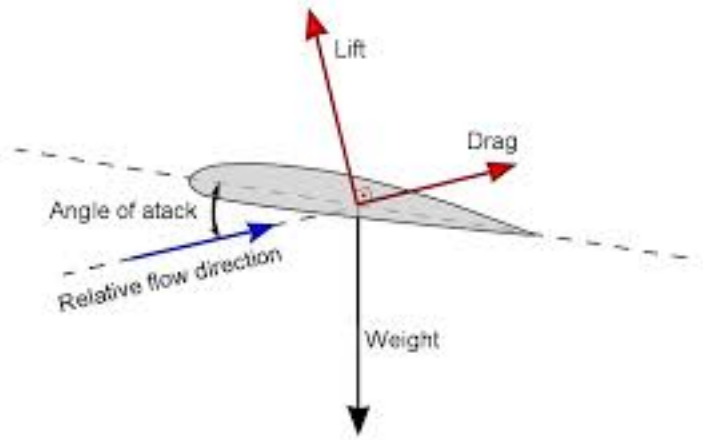
a) pitch and voltage

b) number of blades and voltage

c) surface area and voltage

d) mass and voltage

e) gears and voltage (if we tried this in class)

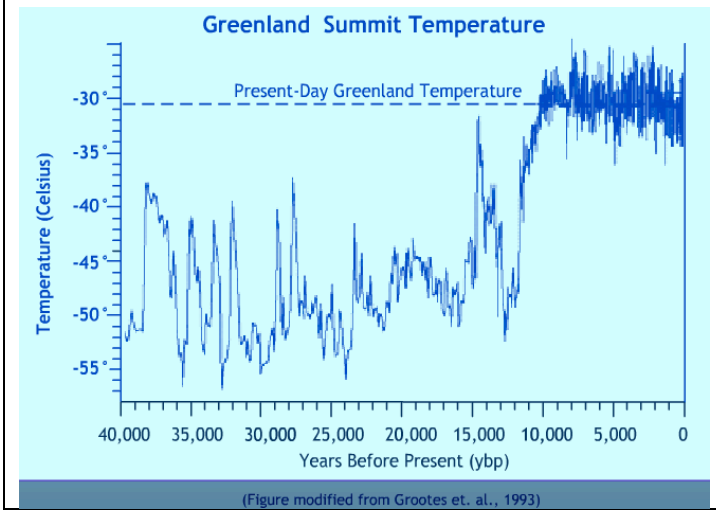


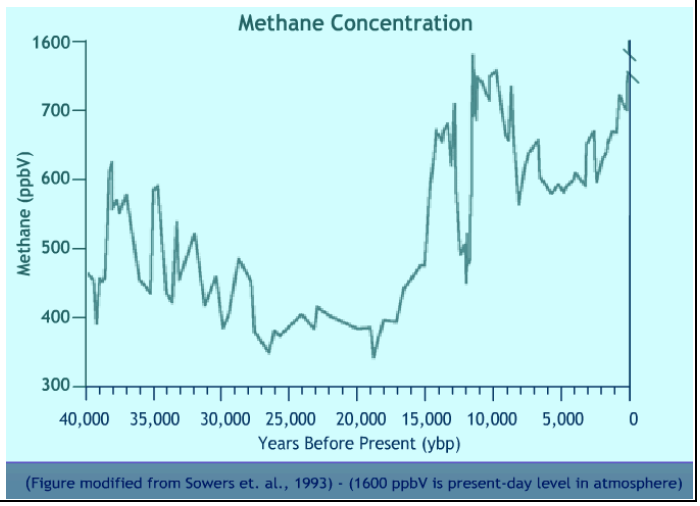
82. On the airfoil diagram below, draw the direction of air flow, label fast wind vs slow wind, high pressure and low pressure air. Explain how the plane lifts or a windmill turns due to Newton's 3rd law and Bernoulli's principle.

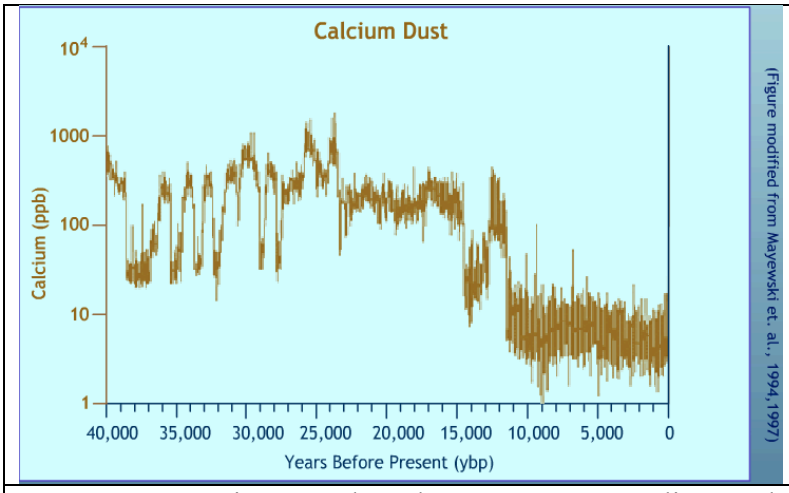
83. Compare the two graphs. What is the relationship between the two graphs?

What is the relationship from 40,000 to 10,000 ybp? Circle one of the following: Inverse Direct

What is the relationship from 10,000 ybp to the present? Circle one of the following: Inverse Direct

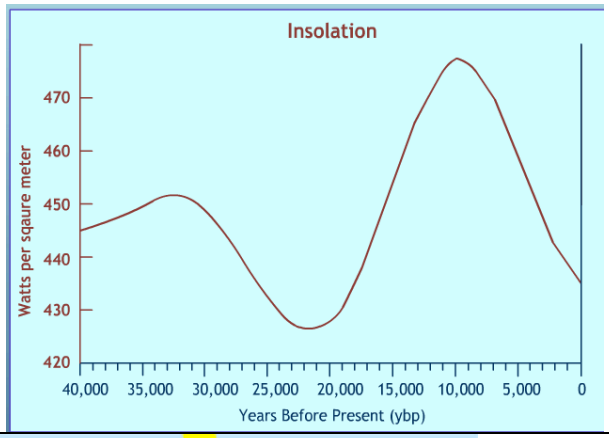




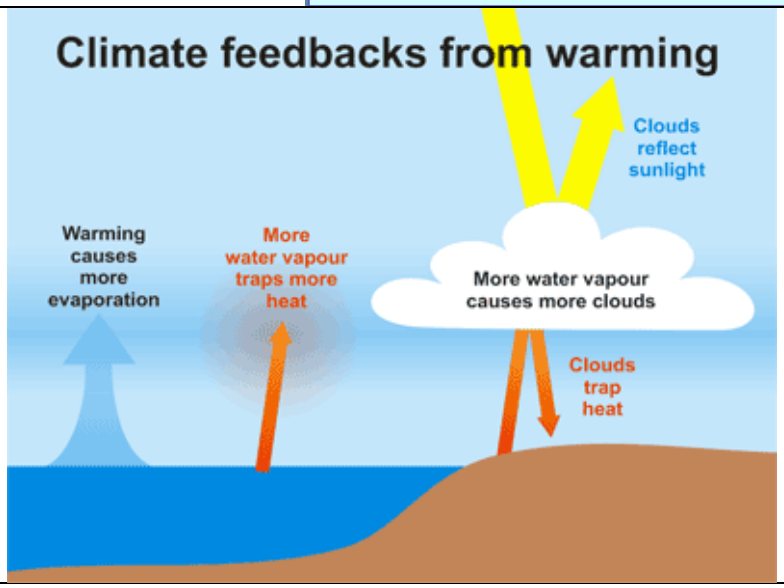


84. Why have calcium dust levels changed over time? What information can be inferred from this graph?

85. Use a previous graph to draw a temperature line on the insolation graph. Give an explanation for the trends illustratd in the last 10,000 years.



86. Explain the feedback mechanism illustrated in the diagam.



87. Identify three methods that scientists can use to study climate in the distant past?