Names:_____

Section (9am or 12pm)

Analyzing the Vostok Ice Core

Each group will turn in ONE exercise for which everyone will receive equal credit. Use complete sentences and sketches to answer each question below. Turn in before you leave class today.

Vostok Antarctica Ice Core

This graph shows calculated temperature, atmospheric CO_2, and atmospheric dust content from the Vostok Ice Core

1. What is the timeframe covered by this graph?

2. What does each colored line on the graph represent (include units)?

3. How does the temperature line vary relative to the CO_2 line? (Do they vary together or inversely?)

4. How does the temperature line vary relative to the dust line? (Do they vary together or inversely?)

5. Why would atmospheric dust content be higher during periods of worldwide cooling?

6. On the graph, identify the five most recent ice ages.
7. On the graph, identify the four most recent interglacial (warm) periods.
8. Carefully observe trends in the temperature line. How does the pattern of warming and cooling vary between glacials and interglacials (i.e. is cooling abrupt or gradual, is warming abrupt or gradual)?

9. Carefully observe trends in the CO_2 line. How does the pattern of high and low CO_2 vary between glacials and interglacials (i.e. is CO_2 increase abrupt or gradual, is CO_2 decrease abrupt or gradual)?

10. Around 125,000 years ago, atmospheric CO_2 increased from less than 200 ppmv to greater than 280 ppmv (>80 ppmv increase). How much did Earth's temperature change over this same interval?

Modern Atmospheric CO_2 measurements

This graph shows measured atmospheric CO_2 for the past 200 years relative to the calculated atmospheric CO_2 from the Vostok Ice Core.

11. What is the timeframe covered by the large graph? What is the timeframe covered by the inset graph?

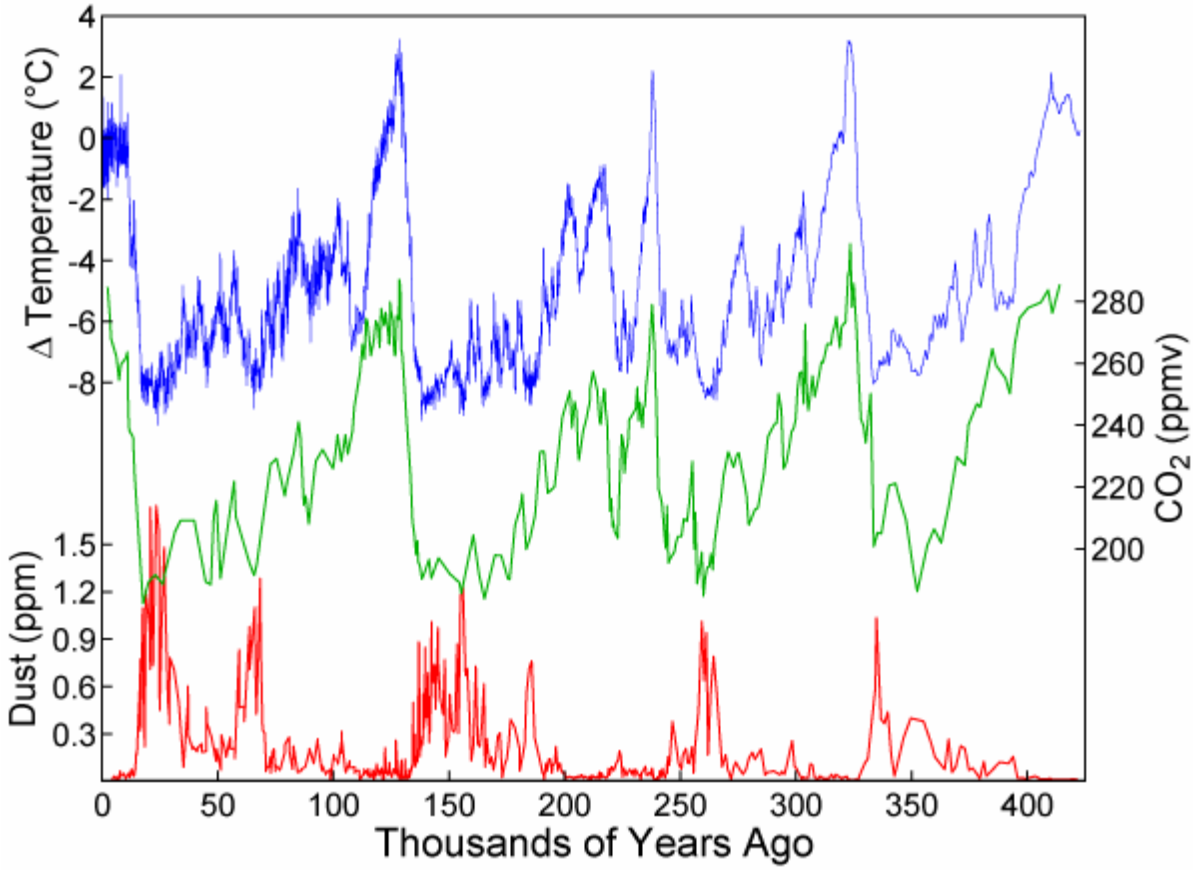
12. What is the calculated maximum atmospheric CO_2 concentration between 100,000 and 400,000 years ago (include units)?

13. What is the measured atmospheric CO_2 concentration in the year 2000 (include units)?

14. How much higher was atmospheric CO_2 in 2000 than any time in the last 400,000 years of Earth history? What percentage increase is this?

15. Based on the relationship between CO_2 and temperature that you observed in the Vostok Ice Core, what do you anticipate that Earth's temperature is doing in response to the modern increase in atmospheric CO_2 concentrations? How much do you think Earth's temperature is likely to increase?

Vostok Antarctica Ice Core



Modern atmospheric CO_2 measurements

