

Global Climate Change: Understanding the Greenhouse Effect

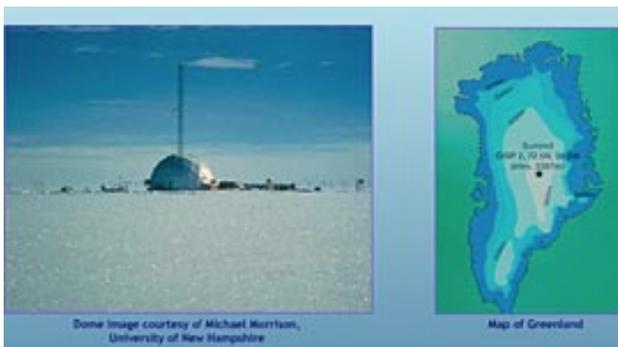
PART A: What is Global Climate change?

Name: _____ EN _

Part I: Watch the Climate Change Video:

<http://ca.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.climatechange/climate-change/>

- 1) Explain the relationship between climate and weather using examples from the video.
- 2) Explain why floods, hurricanes, and tornadoes are aspects of weather, not climate.
- 3) How do scientists measure the average world temperature in past eons?
- 4) The video points out how dramatic climate changes have been in the past. What are possible triggers of these rapid shifts? Is it possible we will experience one of these dramatic shifts in our lifetime?
- 5) Before 8000 B.C. dramatic changes in average temperature occurred over just a few years time. What was happening to the global climate before 8000 B.C. ?
- 6) The graph of average temperatures shows that today's temperatures are higher than they were 10,000 to 40,000 years ago. It also shows that today's temperatures have been dropping in the past centuries. However, what doesn't show on this graph is that temperatures have been increasing over the past several decades. What do most scientists believe is contributing to this increase in temperature?
- 7) Can you think of other possible ways scientists can determine what climate was like in the past besides studying ice cores?



Part 3 Greenland Ice Sheet Project 2: A Record of Climate Change

<http://ca.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.greenland/greenland-ice-sheet-project-2-a-record-of-climate-change/>

1. Analyze the Temperature Graph. Describe the two variables shown on this graph. During what time period did the largest change in temperature occur? Have we seen world average temperature changes occur this rapidly in the past century?

2. Analyze the Methane Concentration graph. When did the largest change in methane gas concentration occur?
3. Look at the Methane Concentration graph with the temperature overlay showing. What is the general relationship between methane concentration and temperature?
4. Analyze the Calcium (dust) graph. How does the calcium dust get into the glacial ice? When did the largest change in calcium dust concentration occur?
5. Look at the Calcium graph with the temperature overlay showing. What is the general relationship between Calcium dust concentration and temperature? Why does this relationship even exist? (Hint: think about reflected light)
6. Analyze the Insolation graph. When did the largest change in insolation occur?
7. Look at the Insolation graph with the temperature overlay showing. What is the essential relationship between insolation and temperature? What else besides the chemicals in the atmosphere effects the temperature on Earth?
8. How might any of these above variables be used to determine past or future climatic conditions?
9. What was involved in the drilling process and evaluation of the ice core segments?
10. Why do you think the thickness of the ice from 0 to 11,000 years ago is not proportional to the thickness of the ice from 11,000 to 25,000 years ago? What is the general trend in thickness of the ice layers with increasing depth?
11. What was the coldest temperature during the time period studied? How many degrees change was there between the coldest temperature and the median present day temperature? Did the temperature change slowly or quickly during this time period? How fast was the fastest temperature change and how many degrees of change were there?

Part III: Natural Climate Change in Djibouti, Africa

<http://ca.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.naturalchange/natural-climate-change-in-djibouti-africa/>

1. What evidence do the shells provide to scientists?
2. Explain how the tilt of Earth's axis is related to our changing seasons.
3. Discuss the scientific theory that explains the climate change in Djibouti.
4. Discuss what the narrator means when describing this change as an example of "natural climate change"?
5. What is the most recent scientific explanation for the dramatic climate change that caused the Sahara's massive lakes to dry up?

