

# Graphing Climate Change

Name \_\_\_\_\_

## Part One: Background Information

Read the article “Background: Climate Data”. Obtain the “Vostok, Antarctica Ice Core Data” and the “Mauna Loa Observatory Data”. Answer the questions below.

1. Is it normal for the Earth’s climate to change? Has it ever changed before?
2. What are greenhouse gases? Do they exist in Earth’s atmosphere naturally?
3. What processes are adding additional carbon dioxide to the atmosphere?
4. What is the current trend of Earth’s temperature and atmospheric carbon dioxide levels? Why does this concern scientists?
5. How can scientists know what happened to Earth’s climate hundreds of thousands of years ago?
6. Specifically, what is in an ice core that can be used to study carbon dioxide levels in air from so long ago?
7. For this activity, what kind of data is provided from the Vostok, Antarctica site?
8. For this activity, what kind of data is provided from the Mauna Loa Observatory?
9. Describe what the “temperature anomaly” value measures.
10. How many years of data does the Vostok Ice Core Data cover? \_\_\_\_\_
11. How many years of data does the Mauna Loa Observatory Data cover? \_\_\_\_\_
12. Examine the Mauna Loa Data. What is the *highest* and *lowest* carbon dioxide concentration provided?
13. Examine the Vostok Ice Core Data. What’s the *highest* and *lowest* carbon dioxide concentration provided?
14. Examine the Vostok Ice Core Data. Would the data provided for the year 398,000 BCE be from the deepest part of the ice core or from the shallowest part? Explain.

## Part Two: Analyzing the Graphs

1. Look at Graph #1. Notice that there are peaks (high points) and troughs (low points)? Do troughs represent glacial periods or interglacial periods? How do you know?
2. Modern humans evolved about 200,000 years ago. Look at Graph #1 to answer the following:
  - a. Describe the carbon dioxide level at that time.
  - b. Describe how the carbon dioxide level changed in the 200,000 years after humans evolved.
3. Which graph represents a time period *after* the Industrial Revolution? \_\_\_\_\_
4. Carbon dioxide has been added to the atmosphere in large amounts since the Industrial Revolution.
  - a. Is this fact evident by looking at the two graphs? Use information from each graph in your answer.
  - b. Compare and contrast the carbon dioxide portion of the graph for Graph #1 and Graph #2.
  - c. Approximately how much higher is the highest atmospheric concentration of carbon dioxide from the Mauna Loa data in comparison with the maximum levels seen in the ice core record?
5. Each graph represents a different period in time.
  - a. Describe the difference between the time period that each graph covers.
  - b. How much of the Vostok Ice Core time period would the time period of the Mauna Loa data take up? You don't have to be specific – make a generalization.
6. If there was no human effect on climate, how would you expect the climate to change over the next several thousand years?