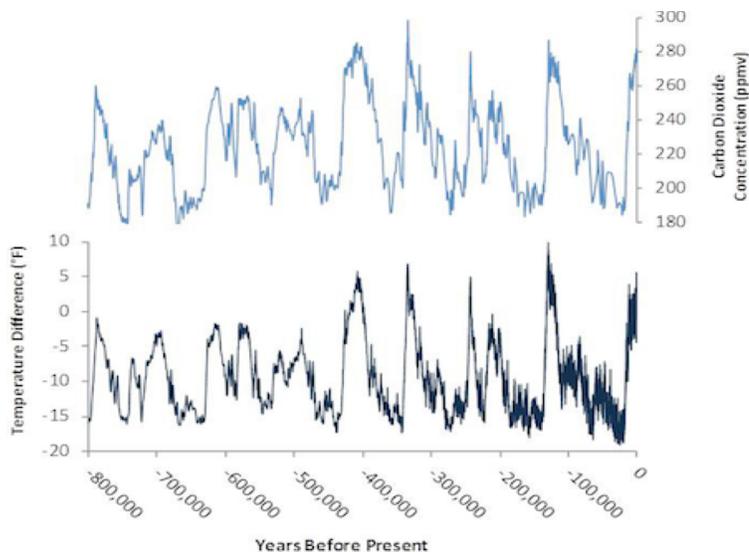


Activity: Global Warming in a Jar

This experiment is designed to give a better understanding how the composition of the Earth's atmosphere affects its temperature. The figure shows that there is a correlation between concentration of CO₂ in the Earth's atmosphere and the temperature in Antarctica (as recorded by ice core data) for the last 800,000 years. Note that warmer periods coincide with periods of relatively high CO₂ concentrations.



Source: EPA

MATERIALS

2 jars with hole drilled in lid to accommodate thermometer
 2 thermometers
 1 chemistry ring stand
 1 high intensity incandescent light (150-200 watt)
 1 timer
 1 soda siphon
 CO₂ cartridge

PROCEDURE

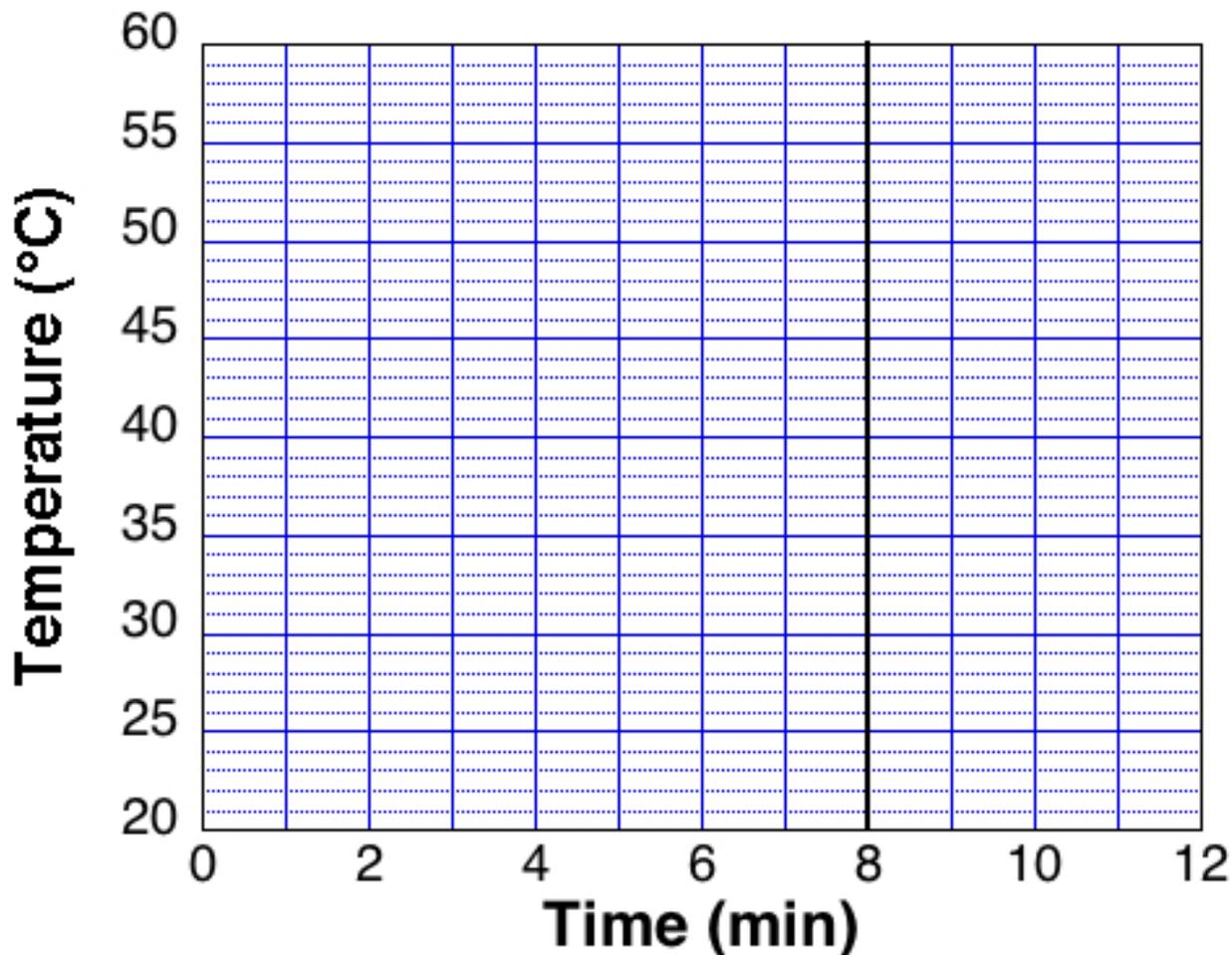
1. In one jar, siphon in some CO₂ and quickly close the lid to retain the CO₂ in the jar and insert the thermometer so that it is about halfway into the jar.
2. In the second jar, close the lid with normal air in the jar and insert the thermometer so that it is about halfway into the jar.
3. If the thermometer is loose in the jar lid, use putty to hold it in place and seal the jar.
4. Attach the light to a ring stand so that it will shine parallel to the tabletop. Do not turn the light on.
5. Place the jars about 2 inches from the light and be sure that the jars are positioned so that they will receive the same amount of light.
6. Record the starting temperature in each jar in the table.
7. Before turning on the light, make a prediction about the results that you will observe in this experiment.
8. Turn on the light and record the temperature in each jar every minute for 8 minutes.
9. After 8 minutes turn off the light and record the temperature every minute for 4 minutes.

Make a prediction: The jars will be heated with the lamp. Before you begin the experiment, predict which jar will show the greatest amount of increase in temperature and explain your reasoning.

Name _____

Time	0	1	2	3	4	5	6	7	8	9	10	11	12
Jar 1 with CO ₂													
Jar 2 with air													

Plot your temperature data for each on the graph below.



FOLLOW-UP QUESTIONS

1. What does the light fixture represent? What do the different jars represent?
2. What does this experiment indicate about how CO₂ behaves differently than some other gases in the atmosphere?
3. What do your data indicate about an atmosphere with an increased amount of CO₂?