GETTING TO THE CORE: THE LINK BETWEEN TEMPERATURE AND CARBON DIOXIDE

VOSTOK, ANTARCTICA, ICE CORE DATA

NAME: _____   **DATE:** _____

Carbon Dioxide Concentration and Temperature Anomaly Data
(398,000 BC to 400 BC)

Year (BC)	CO_2 concentration (ppm)	CO_2 concentration rounded to nearest whole number	Temperature anomaly (°C)	Temperature anomaly (°C) rounded to nearest tenth of a degree
398,000	278		-1.64	
388,000	255.2		-5.34	
378,000	245.9		-4.88	
368,000	229.7		-5.42	
358,000	206.4		-5.8	
348,000	193		-7.64	
338,000	220.4		-7.44	
328,000	234.2		-4.9	
318,000	271.8		-0.12	
308,000	256.3		-3.32	
298,000	241.9		-3.08	
288,000	240.2		-6	
278,000	207.7		-6.17	
268,000	231.4		-5.95	
258,000	184.7		-8.3	
248,000	203.9		-6.52	
238,000	230.4		-2.12	
228,000	245.2		-6.15	
218,000	212.2		-4.31	
208,000	244.6		-3.07	
198,000	242.6		-2.68	
188,000	231.4		-6.49	
178,000	213.2		-6.34	
168,000	197.9		-7.01	
158,000	204.4		-6.25	
148,000	191.9		-7.34	
138,000	192.3		-8.99	

GETTING TO THE CORE: THE LINK BETWEEN TEMPERATURE AND CARBON DIOXIDE

Carbon Dioxide Concentration and Temperature Anomaly Data
(398,000 BC to 400 BC)

Year (BC)	CO_2 concentration (ppm)	CO_2 concentration rounded to nearest whole number	Temperature anomaly (°C)	Temperature anomaly (°C) rounded to nearest tenth of a degree
128,000	263.4		1.47	
118,000	265.2		-0.86	
108,000	245.7		-5.53	
98,000	225.9		-3.45	
88,000	208		-4.69	
78,000	221.8		-3.66	
68,000	227.4		-7.84	
58,000	210.4		-6.53	
48,000	190.4		-5.18	
38,000	209.1		-6.91	
28,000	205.4		-7.95	
18,000	189.2		-7.62	
8,000	261.6		-0.28	
400	284.7		0	

Data source: National Oceanic and Atmospheric Administration (NOAA):
www.esrl.noaa.gov/gsd/outreach/education/poet/Global-Warming.pdf.

GETTING TO THE CORE: THE LINK BETWEEN TEMPERATURE AND CARBON DIOXIDE

VOSTOK DATA INSTRUCTIONS

Instructions for Filling Out the "Vostok, Antarctica, Ice Core Data" Worksheet

1. In the space provided in column three, round the carbon dioxide (CO_2) concentration to the nearest whole number.

2. In the space provided in column five, round the temperature anomaly to the nearest tenth of a degree.

Instructions for Plotting the Graphs

1. You will create two graphs: one for CO_2 concentration and one for temperature anomaly.

2. On both graphs, your x-axis will represent years. Start with 400,000 BC on the left and number as far as the the year 0 on the right, counting by intervals of 10,000 years. Label the axis.

3. On the first graph, the y-axis on the left side of the paper will represent the CO_2 concentration using units of parts per million (ppm). Begin with 100 ppm at the lower end, and number up to 400 ppm, counting by intervals of 10 ppm. Label the axis.

4. On the second graph, the y-axis on the left side of the paper will represent the temperature anomaly in degrees Celsius (°C). Begin with -10.0 °C at the lower end and number up to 2.0 °C, counting by intervals of 0.5 °C. Label the axis.

5. Using different colored pencils, plot the points for CO_2 concentration and temperature anomaly.

6. Write a title on each graph.

GETTING TO THE CORE: THE LINK BETWEEN TEMPERATURE AND CARBON DIOXIDE

CARBON DIOXIDE CONCENTRATION AND TEMPERATURE RATE OF CHANGE

NAME: _____   **DATE:** _____

48,000 BC to 400 BC
Length of time: ____ years

Variable	Value in 48,000 BC	Value in 400 BC	Change	Rate of change per year
CO_2 concentration (ppm)				
Temperature anomaly (^{o}C)				

1901 to 2011
Length of time: ____ years

Variable	Value in 1901	Value in 2011	Change	Rate of change per year
CO_2 concentration (ppm)	296.1 ppm	391.6 ppm		
Temperature anomaly (^{o}C)	-0.16 ^{o}C	0.51 ^{o}C		

Data source: U.S. EPA, *Climate Change Indicators in the United States*: http://www.epa.gov/climatechange/science/indicators/.

CO_2 concentrations are from Antarctica (1901) and Hawaii (2011).
Temperature anomaly is a global average.

GETTING AT THE CORE: THE LINK BETWEEN TEMPERATURE AND CARBON DIOXIDE

NAME: _____   TITLE: _____   DATE: _____

EPA — United States Environmental Protection Agency