Directions for EXCEL 2007

Go to the website  http://teachers.sduhsd.k12.ca.us/bbodas/carbon%20dioxide%20emissions%20historic%202-5%202009.xls
You should see data of Carbon Dioxide Emissions for a variety of sources (total fossil fuels, liquid fuel, solid fuel, cement production, gas flaring, and Per Capita CO$_2$) over many years.

1. Find the excel data for the historic CO2 emissions
2. Copy all the data into a new excel 2007 spreadsheet (make sure that you include all the column headings, and be sure to include the data for the per capita CO2 emissions in the last column…that data doesn’t begin until 1950 so be careful.
3. Make sure the entire data range is selected (highlighted)
4. Click on the insert tab, and select line graph from the chart options. Select line with markers.
5. Drag your graph to open space on the sheet or put it on a different sheet like sheet 2
6. Drag the corner of your graph to make your graph much larger
7. Click on the blue time line on the graph and delete it
8. The per capita data will be hiding on the x-axis…so we need to add a secondary Y axis. Right click on the orange line on the x-axis and select format data series. Select secondary axis to force excel to make a secondary Y-axis for the per capita data (the rest of the data on the sheet is in different units).
9. Go back to the top of the sheet and click on the Layout tab.
10. Click on “Chart title” and add an appropriate chart title
11. Click on “Axis titles” and add an appropriate primary vertical, secondary vertical, and primary horizontal axes titles. Make sure to include units where appropriate as well!!!

12. Take a look at your sophisticated, multi axis, multiple line graph, and ponder the general trends of the historic CO2 emissions.
13. Print a copy of your graph!!!!
Answer the questions below, and refer to the provided web links to help you answer the questions.

**World fuel use (question #1)**

1. How do your plots reflect the history of fuel use in the world?


**Question #2** You have already plotted, refer to your graph to answer the question!!!!

2. Look at the plot for per capita data. What do the data points imply? Why does the shape of this plotted data look the way it does?

3. Suppose the total mass of the Earth’s atmosphere is about $5.1 \times 10^{18}$ kg and is about 0.037% CO$_2$. What was the percent increase in CO$_2$ as a result of the 2000 emissions? Show all your calculations and work.

Refer to your graph for 2000 emissions!

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4a. Identify and describe some of the carbon dioxide sinks in the world.

4b. Describe how humans may be interfering with or inhibiting the sinks.

**Where does CO$_2$ go / Carbon Sinks (question 4a & 4b)**

http://www.newscientist.com/data/images/archive/2604/26041103.jpg


4c. What is meant by anthropogenic sources of carbon?

**Sites with information on Anthropogenic Carbon (question 4c)**


http://oto2.wustl.edu/bbears/trajcom/carbon3.htm


5a. Identify and describe the source of two other greenhouse gases.
5b. What are their effects on the ability of the atmosphere to hold heat?
5c. Compare their (the gasses) heat holding capacities or global warming potentials.
5d. How have the gas concentrations varied over time

*Greenhouse Gasses / Global warming potential (heat holding capacity) / Greenhouse gas levels*
http://www.dnrec.delaware.gov/Documents/2a1a16a18f3e4ffbb31695d5d0d6d5d0CCMaingreenhousegases2.JPG
http://www.aprec.net/images/eco/concentration_uk.gif
http://www.koshland-science-museum.org/exhibitgee/images/causes02.jpg

6a Describe how temperature has varied with the increase in global carbon dioxide levels.
6b. Do you think the data show a direct cause and effect relationship? Why or why not?

*Temperature change in relation to atmospheric global carbon dioxide concentration*
http://www.climatechoices.org.uk/images/globalTempCO2.gif