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2a: "Illinois Carbon Dioxide Emissions Activity"

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Illinois Carbon Dioxide Emissions Activity

Your goal for this activity is to compare the different sources of carbon dioxide emissions, stemming from the consumption of fossil fuels, in Illinois. To do this you will be working with data spanning from 1980 to 2012.

To better be able to understand this data, and to connect the data to what you've learned about the carbon cycle, you will be constructing a series of graphs in order to present a visual representation.

You will be making a graph comparing the totals for the main sources of emissions, including coal, petroleum products, and natural gas. Instructions for the graph are shown in this document. Then you will look at each of the sources more specifically, to see what these emissions can be attributed when comparing residential, commercial, industrial, transportation related, and electric power related usage of fossil fuels. ***This means that for this part of the analysis you should have 4 graphs total.*** The data for each is on a separate tab in your excel file, which can be changed at the bottom.

The last part of this assignment is to create your own analysis.

Pick a comparison that you have not made already. An example would be comparing the emissions due to coal, petroleum products, and natural gas for the transportation related sources, to see which affects the emissions from transportation the most. To do this you would have to copy and paste the data for transportation from each of the three tabs (coal, petroleum, and natural gas) into the "Your analysis" tab, and create another graph. This will bring your total graphs up to five.

Once you have copied and pasted all of your graphs into a word document, examine your data and, underneath each graph, write up a paragraph that addresses the following (as appropriate to the variables for each graph).

1. What had the highest level of carbon dioxide emissions of the variables included? Was it consistent, or did the "top producer" change over time?
2. What trends are seen in the data? Was there a steady change? A lot of variability? What does that tell you about that particular use of fossil fuels?
3. Were fossil fuels used in this way (i.e. coal, petroleum products), thus producing more carbon dioxide, for one purpose more than others (i.e. residential living, transportation, etc)? What used them in this way the least?

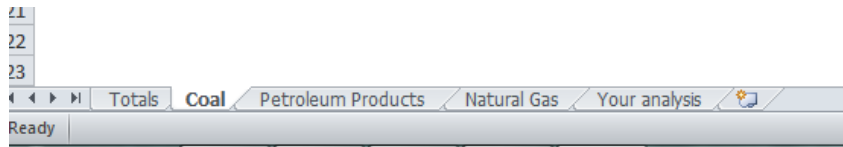
Then, at the end of your document, draw connections between all of your analysis. Write up an explanation of why the data you collected is important, when considering how we understand the use of fossil fuels and the impact of these uses on carbon dioxide emission. Be sure to explain how the use of fossil fuels fits into, and impacts, the carbon cycle.

Also address how might this understanding also help as we try to decrease carbon dioxide emissions in the future? Is there a specific source that we, as a society, should focus on, based on the data that you see?

Note that the instructions here are from Excel 2010, but you may use any other graphing software that you have available. We'd suggest talking with us and using google to find sources for instructions if you are not familiar with the program you are trying to use.

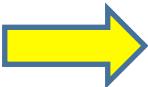
Instructions for graph of totals :

1. When you open your excel document, be sure that the tab at the bottom for "totals" is selected first. (the coal tab is selected in the example below)



2. Once you have that tab open, select the data by highlighting the numbers on the side of the rows representing the years, coal, petroleum products, and natural gas. This should highlight the whole row for each.

| | A | B | C | D | E | F | G | H |
|----|--|---|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 | Illinois Carbon Dioxide Emissions from Fossil Fuel Consumption(1980-2012) | | | | | | | |
| 2 | million metric tons of CO2 | | | | | | | |
| 3 | | | | | | | | |
| 4 | Fuel Totals: | | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 5 | Coal | | 79.0 | 74.5 | 73.0 | 79.6 | 78.1 | 76.1 |
| 6 | Petroleum Products | | 94.8 | 82.8 | 76.8 | 78.9 | 72.1 | 70.3 |
| 7 | Natural Gas | | 56.7 | 55.5 | 52.5 | 50.4 | 55.7 | 51.6 |
| 8 | Total | | 230.5 | 212.8 | 202.3 | 208.9 | 205.9 | 198.1 |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

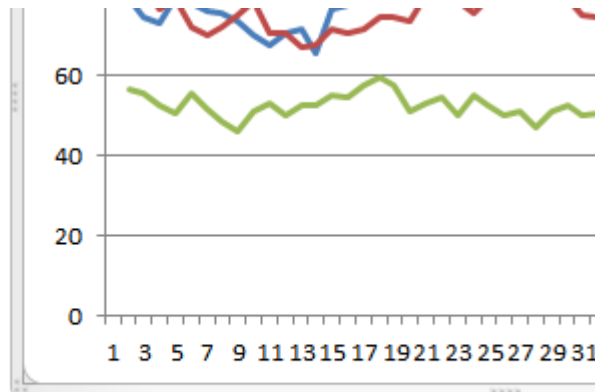


- Once the data for these four rows is highlighted, at the top of the screen go to the "Insert" tab, and then click on the box for line graph.

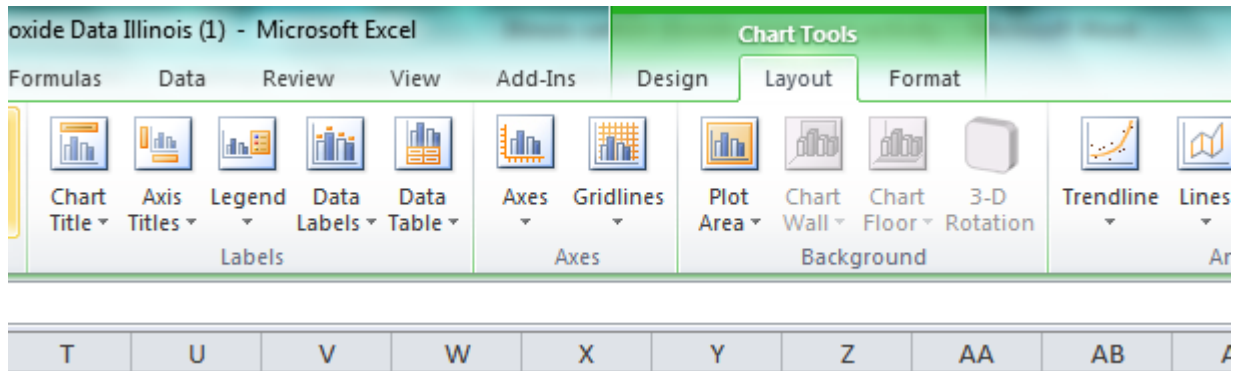
The screenshot shows the Microsoft Excel interface. The 'Insert' tab is active on the ribbon, and the 'Line' chart icon is highlighted with a yellow arrow. Below the ribbon, a spreadsheet is visible with the following data:

| | A | B | T | U | V | W | X | Y |
|----|---|---|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 | Illinois Carbon Dioxide Emissions from | | | | | | | |
| 2 | million metric tons of CO2 | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
| 5 | Coal | | 92.0 | 89.6 | 90.5 | 95.9 | 92.8 | 93.1 |
| 6 | Petroleum Products | | 74.5 | 73.6 | 80.0 | 80.3 | 78.7 | 75.4 |
| 7 | Natural Gas | | 57.5 | 51.1 | 53.1 | 54.6 | 50.3 | 55.3 |
| 8 | Total | | 224.1 | 214.3 | 223.6 | 230.9 | 221.8 | 223.8 |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

- In the drop down menu, pick the first 2-D option for a line graph.



- Once your graph pops up, you will need to format it so that the axes are labeled. You can use the options in “Chart tools” when you have your chart selected to format the Axis titles.



- Once you have completed your graph, copy and paste it into a word document. Then, repeat for your other three graphs, as well as your own analysis.