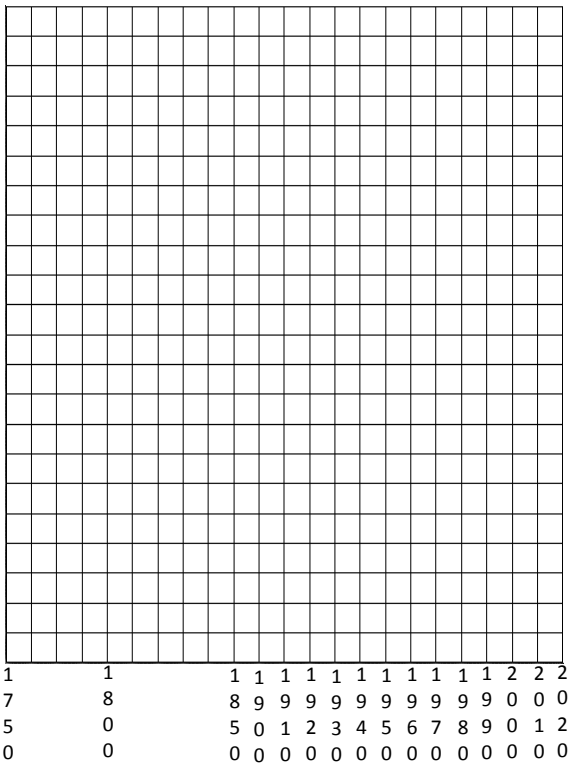
Carbon Dioxide & Global Temperature Correlation

In this activity, you will analyze and graph data on observed global temperatures and CO_2 concentrations. Then you will answer questions about this data. Graph the Carbon Dioxide data found in the table below. The horizontal axis has already been labeled with the years. Label the left vertical axis "Change in Avg. Global Temp." and label the right vertical axis "CO_2 concentrations". Graph the Avg. Global Temp. in RED and CO_2 Concentrations in BLUE.

Atmosphere Concentrations of CO_2 During the Last 265 Years

Year	Change in Avg. Global Temp. (degrees C)	CO_2 Concentration (parts per million-ppm)
1750	0.00	282 ppm
1800	0.13	283 ppm
1850	0.20	290 ppm
1900	0.18	297 ppm
1950	0.48	312 ppm
1980	0.55	335 ppm
1990	0.56	350 ppm
2000	0.42	370 ppm
2010	0.72	390 ppm
2015	0.84	402 ppm



1. What pattern or trend do you notice in CO_2 concentrations? During what years was the trend most pronounced?

2. During what time period was the observed temperature increase the greatest?

3. Examine the date carefully. Does the data support the conclusion that increasing greenhouse emissions are responsible for the increase in observed temperature during the past 265 years? Explain your reasoning below.

4. What are some other natural phenomena that possibly could explain increases in temperature?

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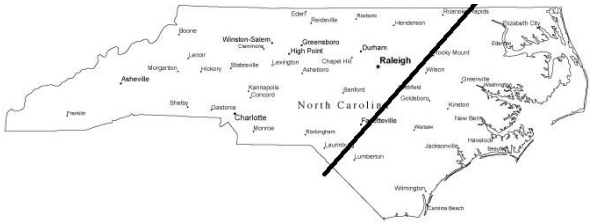
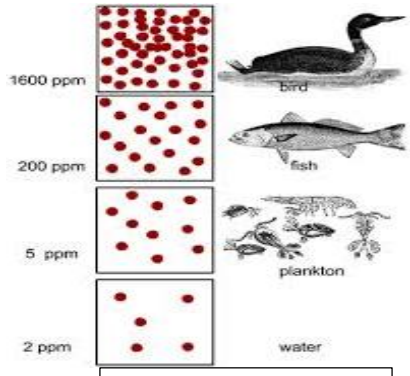
North Carolina Sea Level Rise



The melting of polar ice caps is a severe concern among scientists who study climate change. They predict that if all of the polar ice caps melt, it will cause a rise in sea level by an average of 80 meters. This increased water level will wash over land, making new coast lines. Due to the elevation of N.C., a rise in sea level by 80 meters will cause ocean water to rise to approximately where the line is drawn in the map above. Provide <u>two</u> ways that you think this will impact the state of N.C. directly.

The Effects of DDT Pesticide on Bird Populations

The pesticide dichlorodiphenyltrichloroethane (DDT) was invented in the 1940s and was used after the Second World War in huge quantities across the world to control malaria-carrying mosquitoes. Gradually it emerged that it was disrupting the hormones of birds – particularly birds of prey – causing them to lay thin-shelled eggs which often didn't survive intact. In some parts of the world, such birds were rapidly reducing in number. Pressure from environmental groups in developed countries reduced the use of DDT, which is now effectively banned – only a few countries continue to use it. However, the rate at which its use has declined has been precisely in step with a resurgence in the incidence of malaria, which now kills a million people a year, most of them children and pregnant women. This raises a classic question of balance of risk and benefit. DDT is cheap and effective but it has a lethal effect on one part of the ecosystem.



Bioaccumulation

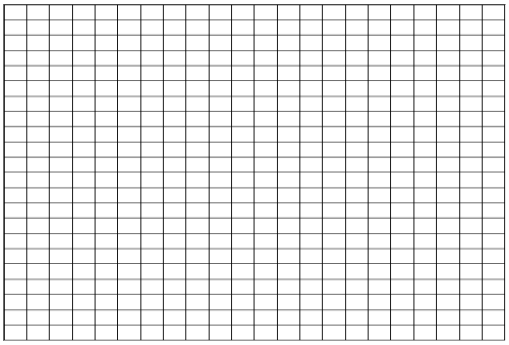
The picture shown illustrates a food chain and the dots represent the amount of chemicals found in the cells at each level of the food chain. What conclusion can you make regarding the image?

What explanation can you provide to support your conclusion?

Glue this page directly into your notebook. Glue Page 2 Tab Here.

Data from Lake Michigan, USA	Bar Graph

Habitat / organism	Concentration of DDT in ppm
Lake water	0.00002
Mud from bottom of lake	0.014
Bottom feeding shrimps	0.410
Trout	6
Herring gulls	99
Peregrine falcons	5000



1. Draw a bar graph of the data from Lake Michigan. The organism / habitat goes on the x axis and the concentration of DDT goes on the y axis. (Don't panic about accurately plotting 0.00002 and 5000 on the same axis, it's the shape of the graph that is important, so it does not matter if the actual plotting is estimated in places.)

2. What does the bar graph tell you about DDT in a food chain?

3. What are the consumers and end consumer in this food chain?

4. What effect does the DDT have on the peregrine falcon?

5. Why is DDT still used across the third world?

6. Give one reason why DDT should still be used and one why it should be banned.

7. After time, the number of mosquitoes in an area sprayed with DDT will start to rise even if the area is still sprayed. Can you suggest why? Hint: think about consumers and the effect removing one consumer can have on a food chain