

NAME: _____ PERIOD: _____ DATE: _____

LAB PARTNERS: _____ LAB #35

GLOBAL WARMING

INTRODUCTION

The greenhouse effect is the normal process that keeps the earth warm. Without it the earth would be frozen, unable to support life. In recent years scientists have expressed fears that we may be altering the greenhouse effect so that more heat is trapped by our atmosphere each year, resulting in a slow increase in the earth's overall temperature. The purpose of this investigation is to analyze various types of data in order to make inferences as to whether global warming is actually taking place.

OBJECTIVES The purpose of this investigation is for you to make inferences about whether or not global warming is occurring, by analyzing several different types of data.

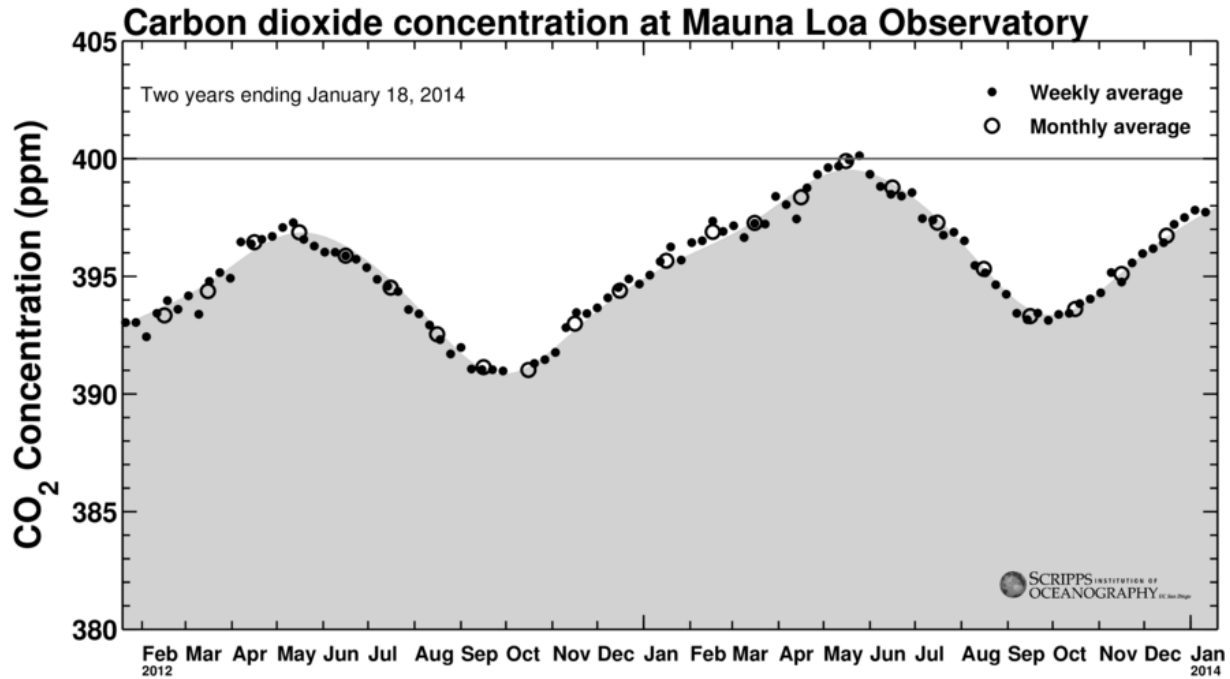
APPROXIMATE TIME 1-2 periods

PART I CARBON DIOXIDE LEVELS

The graph below shows the average concentration of carbon dioxide in the atmosphere in parts per million (ppm) by months over a four year period.

Examine the graph and answer questions 1-7.

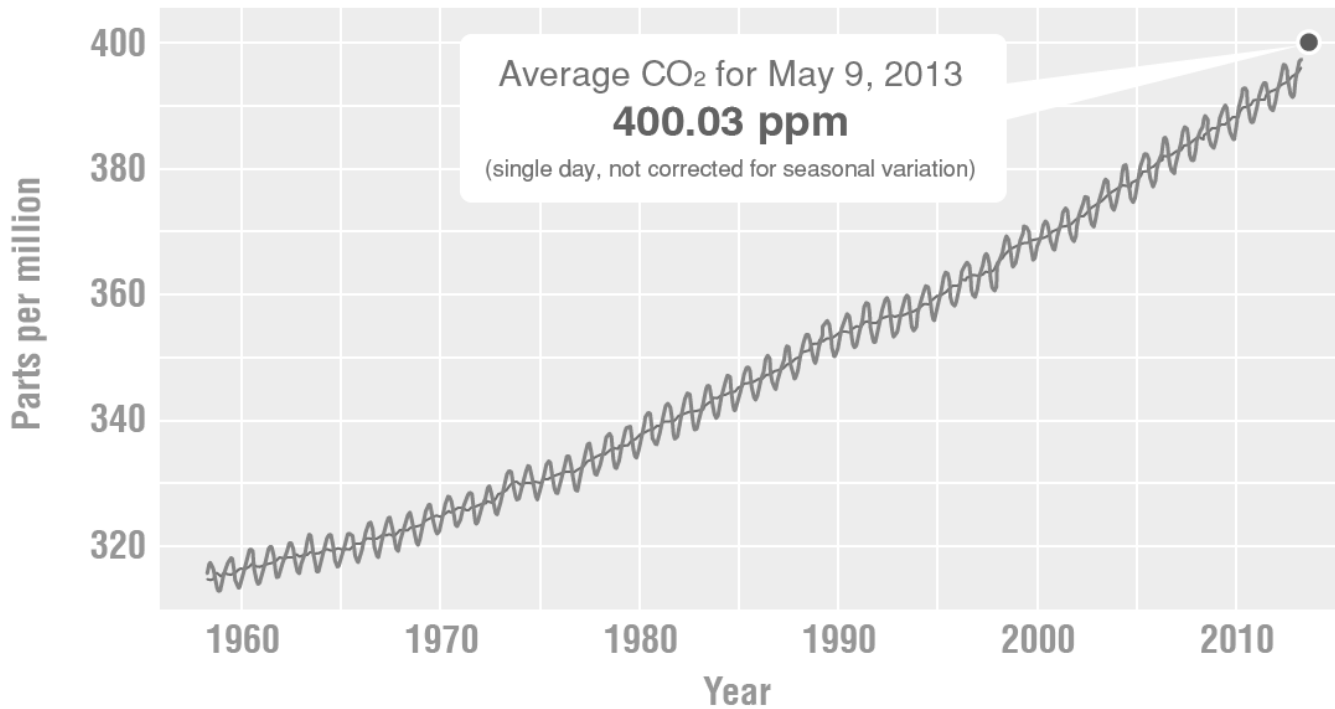
The graph shows the pattern of change in carbon dioxide concentration over two years:



1. Describe the short term change which occurs in carbon dioxide concentration during a one year period.
2. During which season of the year is the carbon dioxide concentration of the air the highest?
3. During which season of the year is the carbon dioxide concentration of the air the lowest?
4. What gas do green plants take from the air to manufacture sugars and starches in the process of photosynthesis?
5. What is the most logical explanation for the decrease in carbon dioxide during the summer months?
6. What are two possible explanations why the carbon dioxide concentration increases during the winter months?
7. What effect if any will the destruction of tropical rainforests have on the carbon dioxide concentration of the air? Why?

The graph below shows the average carbon dioxide concentration over 50 year period of time:

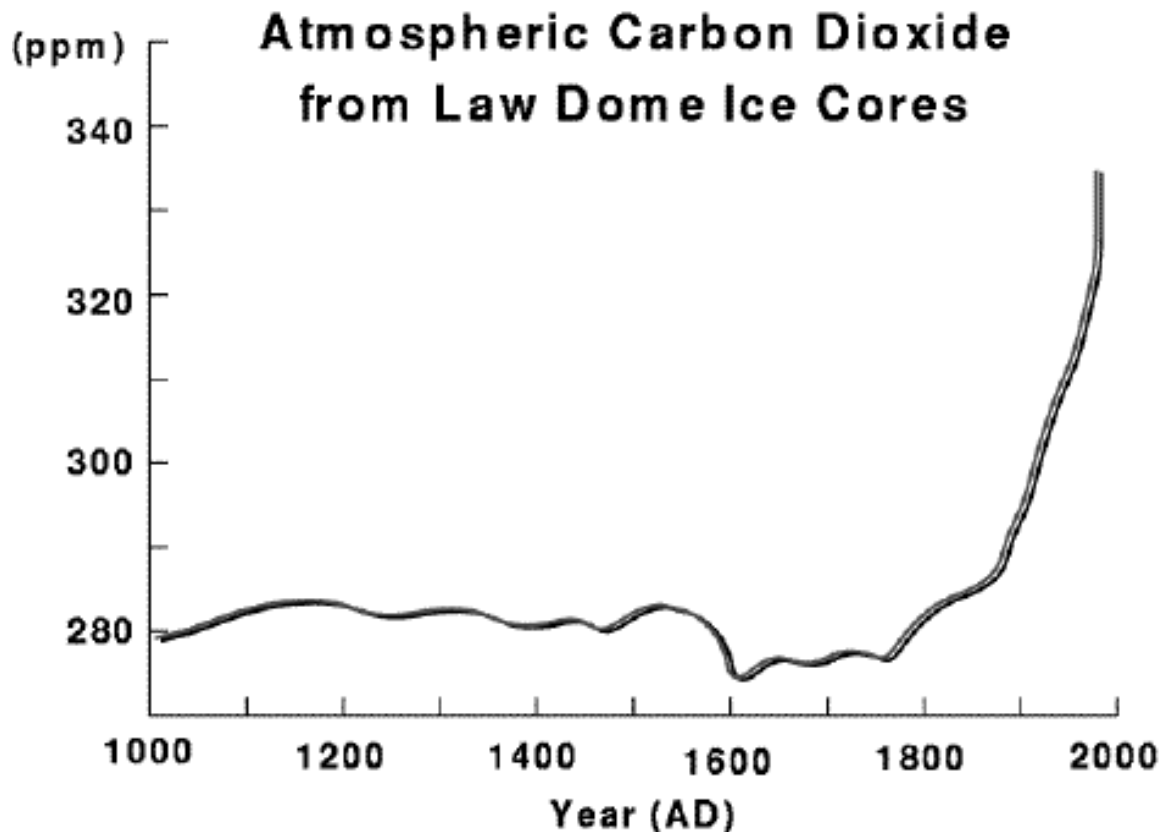
Carbon Dioxide Concentration



Credit: NOAA/Scripps Institution of Oceanography

Answer the following questions based on the graph above.

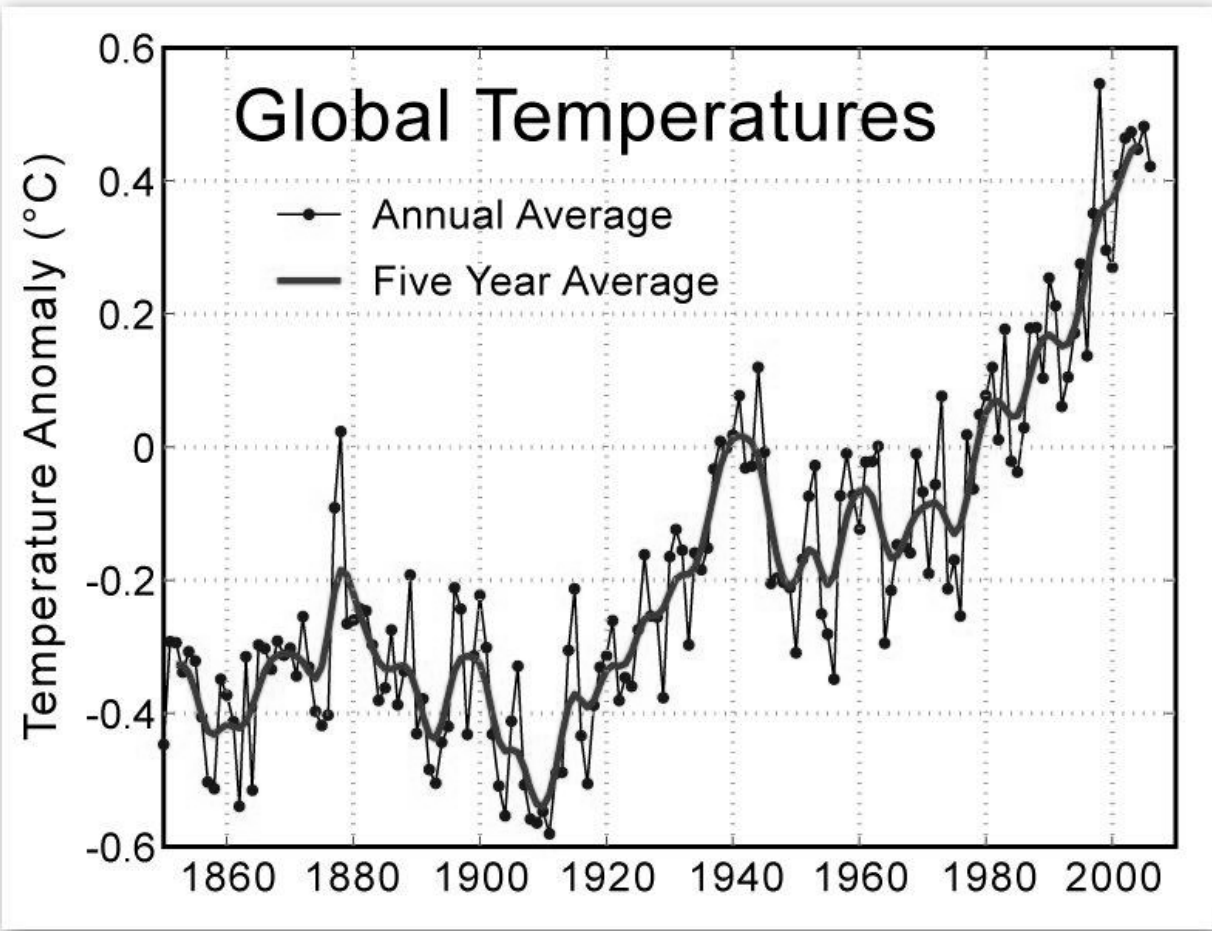
8. This graph clearly shows the seasonal variation that you saw in the previous graph. What long term trend about atmospheric carbon dioxide concentration is shown by this graph?
9. What do you think is responsible for this?



One of the problems with making inferences about global warming is deciding if changes we see are caused by humans or are just part of natural variations. The graph above shows atmospheric carbon dioxide levels over a much longer period.

10. Have atmospheric carbon dioxide levels been increasing steadily over the past 1000 years? How can you tell?

11. What events in human history in the late 1800's and early 1900's are responsible for the dramatic change in carbon dioxide concentrations?



12. If atmospheric carbon dioxide levels are increasing, then what should be happening to global temperatures?

13. Explain in detail how carbon dioxide levels can affect global temperatures.

14. Does the graph above support your answer to question 12?

PART II HURRICANES

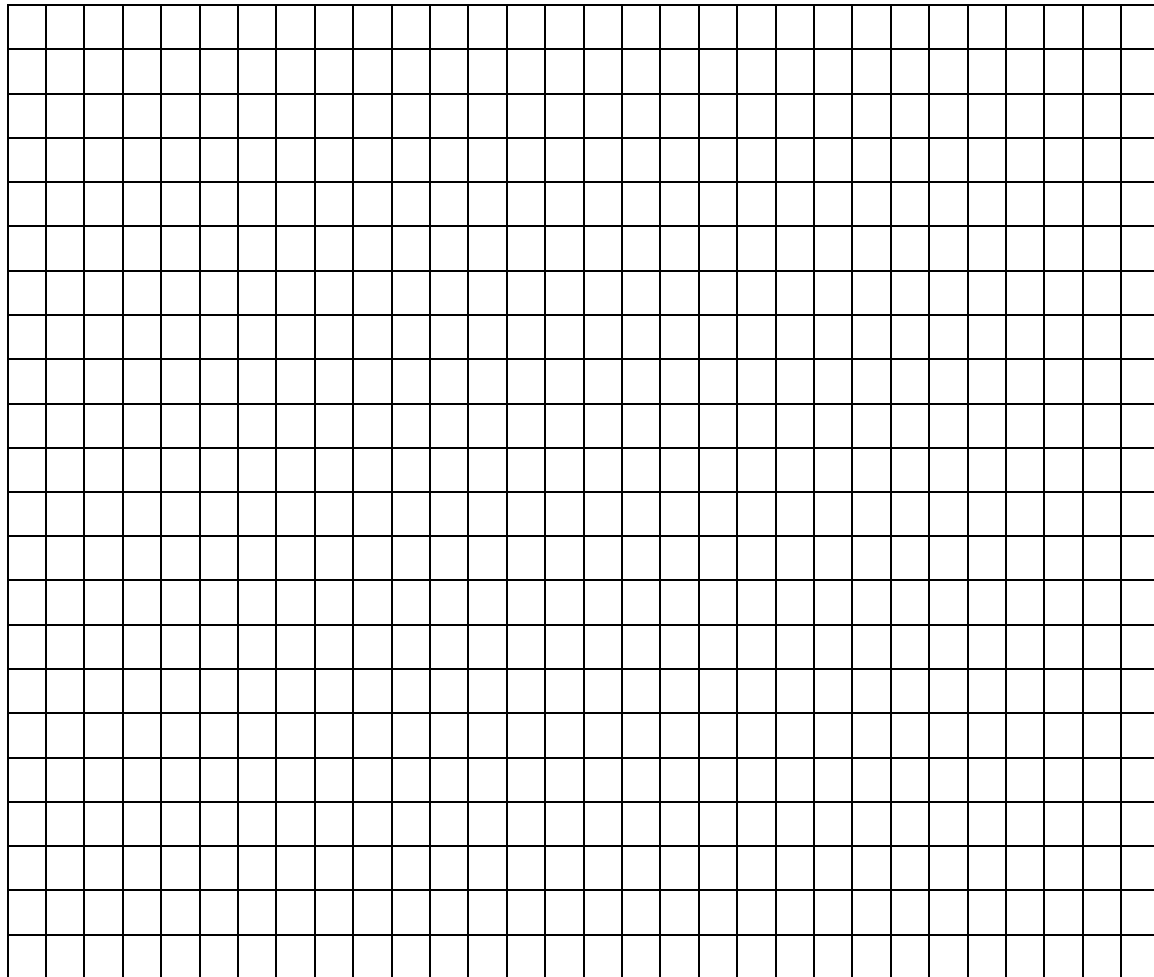
One of the anticipated effects of global warming is that hurricanes will increase in intensity. Let's look at the historical record to see if we can find any sign that this change has started to take place. Using the data table below which shows the most intense hurricanes in the United States, determine how many storms took place in each of the listed decades. Record your data in the data table.

HURRICANE	YEAR	CATEGORY
Florida Keys	1935	5
Camille	1969	5
Andrew	1992	4
Florida Keys	1919	4
Florida	1928	4
Donna	1960	4
Texas	1900	4
Louisiana	1909	4
Louisiana	1915	4
Carla	1961	4
Hugo	1989	4
Florida	1926	4
Hazel	1954	4
Florida	1947	4
Texas	1932	4
Celia	1970	3
Allen	1980	3
New England	1938	3
Frederic	1979	3
Northeast US	1944	3
South Carolina	1906	3
Betsy	1965	3
Florida	1929	3
Florida	1933	3
Texas	1916	3
Mississippi	1916	3
Diane	1955	3
Texas	1933	3
Beulah	1967	3
Hilda	1964	3
Gracie	1959	3
Texas	1942	3
Florida	1945	3
Florida	1921	3

Carmen	1974	3
Edna	1954	3
Florida	1949	3
Fran	1996	3
Eloise	1975	3
King	1950	3
Louisiana	1926	3
Louisiana	1918	3
Florida	1910	3
North Carolina	1933	3
Florida	1909	3
Florida	1950	3
Texas	1941	3
Florida	1917	3
Texas	1909	3
Mississippi	1905	3
Elena	1985	3
Carol	1954	3
Ione	1955	3
Emily	1993	3
Alicia	1983	3
Connie	1955	3
Florida	1944	3
Louisiana	1934	3
Florida	1948	3
Florida	1936	3

DECADE	NUMBER OF STORMS
1920's	
1930's	
1940's	
1950's	
1960's	
1970's	
1980's	
1990's	

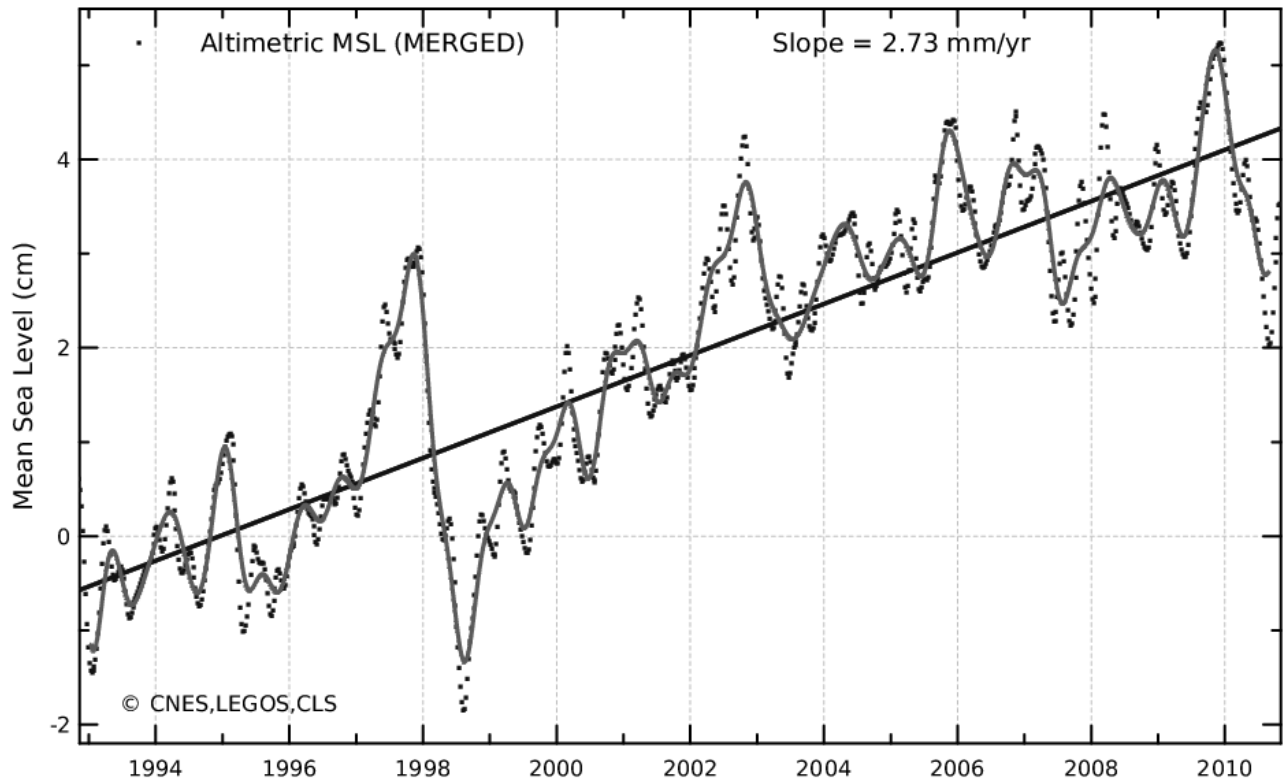
Graph the data above on the graph below. (Construct a bar graph)



1. Based on your graph, have the number of intense hurricanes been increasing?

PART III Climate and Sea Level

The level of the oceans has always fluctuated with changes in global temperatures. During ice ages when global temperatures were 9 degrees F lower than today, much of the ocean's water was tied up in glaciers and sea level was often over three hundred feet lower than today. On the other hand, during the last interglacial period (100,000 years ago) when temperatures were about 2 degrees F warmer, sea level was approximately 20 feet higher than today.



The graph above shows the average rate of sea level rise over a 15 year period.

2. What are several possible reasons why sea level is rising?

