

Mr. Schwebach—11<sup>th</sup> grade Chemistry

### The Global Warming Project.

3 components: 5 page, (double space font size 12, 1 inch margins) **written paper** including a 1 page (single space size 12 font, 1 inch margins) **experiment**, (5 pages maximum text amount), and **oral assessment**.

Introduction:

**Global Warming** is a current issue which focuses on the belief that the earth's average temperature has increased during the last century. There are many different views as to the causes of this global shift in climate. Some scientists agree with the theory of The Greenhouse Effect as the cause of the increase in the temperature. However, there are other scientists who feel that The Greenhouse Effect is normal and the earth's cyclic nature has taken effect. Regardless, the idea of Global Warming is written about daily and weekly in newspapers and magazines, and many news reports cover the issue regularly.

### **The Assignment:**

Your assessment for Chemistry 5, is to develop an in depth research analysis of the issue of Global Warming. Your research must be very current and include the most recent information available on this topic. You must include current periodicals, books, and Internet sources as you present you evidence for or against this issue. You must also take a stand and develop your research to prove or disprove that Global Warming is real.

As juniors, it is essential that this research project be more comprehensive than your original explorations of this issue in your freshman year. You will be asked to use your knowledge of chemical formulas and reactions to explain certain situations. Also, since the issue of Global Warming covers many sciences, you will be asked to deal with the environmental and earth science aspects.

Finally, since you have been exposed to the processes of the scientific method, you will be asked to develop and conduct a mini-experiment at home which will strengthen your research for this issue. The experiment must include all of the aspects of the scientific method.

### **The Specifications:**

The assignment is to be no less than 5 type written pages

which are double spaced in normal font. Current graphs, charts, and diagrams which will bolster your research are to be included. You must include a complete bibliography of only those sources which are included in your text. Your laboratory component must follow the format used in the scientific method. That is a problem must be stated, your hypothesis is made, your variables are controlled, the procedure steps are listed, your conclusions are listed, and a final statement is written.

The due date is the day you are assessed.

Your research paper must include the following:

1. The causes of global warming including what scientists consider to be the start of the problem.
2. The "Greenhouse Gases" including the source of each gas. You must include the formulas for each gas, the reaction which caused the gas to be produced, and the types of chemical reactions which produced the specific gas. Please separate those natural processes from "man-made" processes.
3. The method by which the atmosphere acts like a "Greenhouse". You must mention and explain The Electromagnetic Spectrum and where the Sun's energy fits into this scheme. You must include the exact method by which the energy of the sun is changed normally into heat. Also, include the processes of convection, conduction, radiation, transmittance, absorption, and scattering of energy. A mention of specific heat is also a must for proper explanation of this heat transference. Include the heat trapping mechanism of greenhouse gases.
4. The mechanism by which greenhouse gases produce "Acid Rain. Include the formulas and the types of reactions for the various types of acid rain. You must also include using chemical formulas and chemical reactions, the effect the acid rain has upon the earth's surfaces.
5. Your paper has to include the following: The Effects of Global Warming on:
  - a. The temperature past and present
  - b. The habitable land areas
  - c. The polar ice caps
  - d. The level of the seas
  - e. Ocean water salinity
  - f. The rise of Hurricanes and Tornados

g. Marine and terrestrial ecosystems

## 6. The Role of Photosynthesis

- a. The mechanism and chemical formula for photosynthesis
- b. How the process of photosynthesis alters the atmosphere
- c. The mechanism by which photosynthesis can reduce the effects of Global Warming

## 7. The Scientific Solutions to Global Warming

- a. The role of science in it's attempt to stop the production of the Greenhouse Gases:
  1. List current devices which are being used like:
    - a. catalytic converters in cars
    - b. pollution control devices
  2. Explain how this scientific device operates to control greenhouse emissions.
  3. Use any formulas or equations to explain the science involved.
- b. The current scientific methods which use recycling techniques to save energy and produce useful products.
  1. Cite unique recycle methods other than the recycling of paper, metal, and plastics.

## 8. The Global Solutions to Global Warming

1. The attempts made by foreign countries to lower greenhouse emissions.
2. Worldwide treaties and legislation to lower greenhouse gasses.
3. The role of The United States as the leader of the world to lower greenhouse emissions.

## 9. Your paper has to explain the two opposing views on Global Warming:

- a. Global Warming and the Greenhouse Effect are the result of human processes and industrialization.

- b. Global Warming and the Greenhouse Effect is a normal cyclic pattern of the earth, similar to those of the "ice age"
  - c. Include the role of "Ice Core Samples" as you explain the history of the earth's fluctuating temperatures.
  - d. Define "El Nino" and "La Nina" as to its role in the two opposing theories.
10. Take a stand, and express your belief as to which theory seems to make the most sense to you and your research. Discuss your reasons for your belief.
11. Make a final statement about Global Warming as to:
- a. The future of the world
  - b. What the planet will look like at the end of this century
  - c. What role will Global Warming play in evolution and extinction of species.
12. **Your Experiment.** A complete, detailed description of your model of The Greenhouse Effect: Include:
- a. The Problem
  - b. Your Hypothesis
  - c. Materials used
  - d. The Variables and controls
  - e. The procedure used
  - f. The results
  - g. The conclusions
  - h. Data tables, graphs

**your references:**

you need a total of at least 10 references. These can be separate pages from within the same web site, but each site needs to address a specific concept within your paper. Several references can be found on my web page: <http://drjreid.com/interest.htm> , see the "global warming hyperlinks" at the bottom of the page.