**LEWISBURG AREA SCHOOL DISTRICT**

**LESSON PLAN**

**Teacher Name: \_\_\_\_\_Van Wagner\_\_\_\_\_\_ Class: \_\_\_\_\_\_\_\_\_AP Enviro**

**Topic: \_\_\_Climate change CO2 Date of Lesson: \_\_Class #47**

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| **LESSON ESSENTIAL QUESTION**: | **Essential Questions:**  Can humans cause a significant change to our atmosphere?  Who is responsible for reducing atmospheric pollution? |
| **STANDARD / LEARNING TARGET:** | **Academic Standards:**  4.3.10.A. Describe environmental health issues.  \* Identify the effects on human health of air, water and soil pollution and the possible economic costs to society.  \* Describe how indoor pollution may affect human health (e.g., dust mites, fumes, cat dandruff).  \* Explain the costs and benefits of cleaning up contaminants.  \* Explain how common household cleaning products are manufactured and how to dispose of their by-products after use.  4.8.10.C. Analyze how human activities may cause changes in an ecosystem.  \* Analyze and evaluate changes in the environment that are the result of human activities.  \* Compare and contrast the environmental effects of different industrial strategies (e.g., energy generation, transportation, logging, mining, agriculture). |
| **ACTIVATING STRATEGIES**:  (Anticipatory Set) | Bell Ringer:  What gases make up the Earth’s atmosphere (give percentages)?  Answer:  78% Nitrogen  21% Oxygen  1% other |
| **KEY VOCABULARY**: | Atmosphere, troposphere, stratosphere, ozone, radiation, |
| **RESOURCES:** | Teacher slide show, demonstration, and lecture. |
| **TEACHING STRATEGIES**: | Carbon dioxide falls into the “1% other” category. In this lesson, we will focus on carbon dioxide levels in the Earth’s atmosphere and investigate how that relates to the earth’s temperature.  CO2 is known to trap solar energy. We are increasing the amount of CO2 in the atmosphere by burning fossil fuels. (coal, oil, and natural gas)  Show predicted temp change:  <http://www.youtube.com/watch?v=h88WF4wOqwI>  Students are to get macbook computers and begin lab worksheet “carbon dioxide and temperature stabilization”  Teacher circulates from student to student during lab. (length of activity approximately 25 minutes)  Teacher checks 1st set of answers on each student’s worksheet.  Show ice melt video:  <http://www.youtube.com/watch?v=3F9FbdqGRsg>  Short video showing one model of artic ice cap:  <http://www.youtube.com/watch?v=neXB1XzMu7Y&feature=related>  These visual models represent 1 of many environmental changes that may occur due to rising CO2 levels. Discuss others.  Lowering pH of oceans  More rain in wet areas, less in dry areas.  Sea Level change  Show sea level rise models:  <https://www.cresis.ku.edu/research/data/sea_level_rise/index.html>  Discussion: (10-15 minutes)  Discuss analysis questions from end of worksheet:   1. What are some specific things the USA can do to reduce fossil fuel use? 2. Look at your estimated percent CO2 reduction. Do you think the USA can reduce emissions by this amount by the year 2100? 3. What is something you can personally do in your lifetime to reduce CO2 emissions?   4. Write down 1 question you have about this lab activity. |
| **EXTENDED THINKING ACTIVITY / ASSIGNMENT:** | Chapter 20 questions assigned. Due in 1 class |
| **SUMMARIZATION/ CLOSURE:** | Exit Bell Ringer:  Write down 1 thing you can do in your life, that will reduce carbon dioxide emissions to our atmosphere. |