Lesson Title: Industry and the Environment
Teacher: Amanda Adley, Business Education, Broadneck High School
Purpose: While attending the Earthwatch expedition, I learned about ecosystem and how both human and environmental factors affect the ecosystem. As such, and in keeping with my subject area, I wanted to create a lesson plan on the human factor, specifically industry's affect on earth's ecosystem. I want to show students how industry affects the earth negatively and to research alternatives for companies to use in their manufacturing to alleviate their affect on the environment.
Grade Level: High School 10-12
Number of Students: 120
Content Area: Business Education
Time Allotted: 4 class periods (80 minute each)

- Day 1: Class Warm-up; PowerPoint Presentation with background of industry and how things are made. Various short class projects to get student thinking about industrial processes and greenhouse emissions/environmental concerns.
- Day 2: Research project 1: Choose a manufactured product used by the student everyday and research the lifecycle of the product. Make a note of which steps result in environmental concerns. As extra credit, research environmentally sound alternatives to steps that produce a negative impact on the environment.
- Day 3: Research project 2: Choose a company that incorporates environmental responsible practices into their business. Complete the following: Provide a brief overview of the company and their business. Describe these practices and how they help the environment. Describe how do these practices help the company in costs, image, employee and customer morale? Personal thoughts: eg. can the company do more/less?
- Day 4: Student presentations of their choice – either Project 1 or 2 with visual aid (PowerPoint or Poster)

Academic Standards: There are no business education standards in Maryland however, Broadneck High School is a Green school and this would fall into our school goal of environmental awareness and it's incorporation across all curriculum.

Goal: Students will be able……

- To gain an understanding of industry and how products are made. Specifically, how some product manufacturing results in environmental threats.
- To examine specific companies and how they are helping in alleviating the environmental impact of their business processes.
- To see how some of the positive processes instituted by businesses to help the environment also positively affects employees, customers and business costs.

Performance Indicators: Final Projects Include…

- 2 Research Projects and 1 student presentation (see attached rubric)

Background Information: Student will gain a knowledge of industry and environmental concerns on Day 1 of this lesson. This will aid them in their projects on the following days.

Materials:

- PowerPoint created by teacher
- Warm-Up
- Reading Passage on Industry provided by "Classroom Complete Press" 2008 – ISBN: 978-1-55319-408-8
- Internet/computer access
- Poster paper and markers

Technology: Projector for PowerPoint, computer internet access for research, and MS Office for visual aids.

Instructional Procedure:

1. Day 1: Introduction lesson on industry and manufacturing.
    a. Students will complete the warm-up on manufactured vs. raw materials in industry.
    b. PowerPoint – what are greenhouse gas emissions? How does industry cause these during manufacturing?
    c. Reading: "Industry" with follow-up questions.
2. Day 2: Learn more about the lifecycle of a product and which steps produce greenhouse gas emissions:
    a. Choose a manufactured product you use every day. Research the lifecycle of the product and include the following:
        i. What are the raw materials used in manufacturing this product and how do people get these raw materials?
        ii. How are these materials made into the product? Where are the factories that make the product? What are the processes involved?
        iii. What kinds of packaging are usually used for the product? How is the packaging produced?
        iv. How is the product shipped to stores?
        v. How is the product disposed of after its use? Are any special steps needed to dispose of the product safely?
        vi. Note any steps which may result in greenhouse gas emissions.
        vii. For extra credit, find an alternative to the steps which produce greenhouse gases.

viii. If presenting this project, make a poster, chart or powerpoint that shows each step in the lifecycle of you project and which emit greenhouse gases.

3. Day 3: Examine on specific company that practices environmental responsible processes in their business.
    a. Choose a company that incorporates environmental responsible practices into their business and complete the following:
        i. Provide a brief overview of the company and their business.
        ii. Describe these practices and how they help the environment.
        iii. Describe how do these practices help the company in costs, image, employee and customer morale? Personal thoughts: eg. can the company do more/less?
        iv. If presenting this project, create a powerpoint or poster based on your findings.

Assessment: Both projects will be graded according to a standard rubric. One presentation will be graded based on a standard presentation rubric.

Connection to other content areas: Social studies – corporate social responsibility
Science – an understanding of greenhouse gas emissions

Day 1 Warm-Up

Industry

Terminology and background research:

Greenhouse Gas Emissions:
http://www.eia.doe.gov/bookshelf/brochures/greenhouse/Chapter1.htm

Raw Materials: http://www.enotes.com/business-finance-encyclopedia/consumer-industrial-goods

1. **List 10 things you use every day that were manufactured by people. Next to each item, describe the raw materials that are used to make the items you listed.**

2. Think about how items are made. What parts of the manufacturing process do you think result in greenhouse gas emissions?

Day 2: Learn more about the lifecycle of a product and which steps produce greenhouse gas emissions:

Research Project 1:

Choose a manufactured product you use every day. Research the lifecycle of the product and include the following:

1. What are the raw materials used in manufacturing this product and how do people get these raw materials?
2. How are these materials made into the product? Where are the factories that make the product? What are the processes involved?
3. What kinds of packaging are usually used for the product? How is the packaging produced?
4. How is the product shipped to stores?
5. How is the product disposed of after its use? Are any special steps needed to dispose of the product safely?
6. Note any steps which may result in greenhouse gas emissions.
7. For extra credit, find an alternative to the steps which produce greenhouse gases.
8. If presenting this project, make a poster, chart or powerpoint that shows each step in the lifecycle of you project and which emit greenhouse gases.

See attached grading rubric for total points and requirements.

Day 3: Examine on specific company that practices environmental responsible processes in their business.

Research Project 2:

Choose a company that incorporates environmental responsible practices into their business and complete the following:

1. Provide a brief overview of the company and their business.
2. Describe these practices and how they help the environment.
3. Describe how do these practices help the company in costs, image, employee and customer morale? Personal thoughts: eg. can the company do more/less?
4. If presenting this project, create a powerpoint or poster based on your findings.

See attached grading rubric for total points and requirements.

Day 4: Oral Presentations

Instructions:

Choose one of the two research papers on industry and the environment to present in class. Be sure to prepare a visual aid to be presented to the class during the research paper presentations. See rubric for grading criteria.

NAME: _____

Reading Passage

Industry

Think about all of the things you use every day that are **manufactured**, or made by people. Pens, desks, computers, refrigerators, music players, even this book you are reading all had to be manufactured from raw materials, like trees, metal ores, and petroleum oil. The mining of raw materials, production of goods in factories, and the packaging and shipping of goods to stores results in a lot of greenhouse gas emissions.

STOP

What are manufactured products?

_____

_____

How can industries lower emissions?

Warehouse

Many industries are now working to lower greenhouse gas emissions. Remember that the energy to run vehicles and power factories often comes from burning fossil fuels. So reducing energy use also reduces greenhouse gas emissions. Recycling raw materials uses less energy than getting new supplies of raw materials. The packages that products are wrapped in use raw materials and energy to make. So using less packaging also results in less energy use. Some industries are finding ways to use less energy by lighting factories, warehouses, and stores with natural light. Others are using alternative fuels to run vehicles and provide electricity for buildings.

After You Read

NAME: _____

Industry

1. Number the events from **1** to **5** in the order they occur in the manufacturing process.

- ☐ **a)** packaging the product
- ☐ **b)** mining raw materials
- ☐ **c)** shipping the product
- ☐ **d)** assembling the product in a factory
- ☐ **e)** transporting raw materials to a factory

2. On the lines below, list steps that industries could take to help lower greenhouse gas emissions.

_____

_____

_____

_____

_____

3. Circle the raw materials.

trees	**plastic**	**petroleum oil**
glass	**metal ores**	**paper**

NAME: _____

Industry

4. Answer each question with a complete sentence.

a) Explain why choosing products with less packaging can help lower greenhouse gas emissions.

_____

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b) Explain why recycling can result in lower greenhouse gas emissions.

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