

Learning Activity Template

Title: How Science and Technology Effect Our Environment

Curriculum: Applied Chemistry or Ecology Project

Grade-Level Span: 11th and 12th Grade Students

PURPOSE:

Students will know that technological changes and scientific advances are often accompanied by environmental changes.

(MN Science Standard: 9-12 History of Science: Strand I: Substrand C: Benchmark 4)

DESCRIPTION:

Students will research and analyze how a scientific development has helped people, but affected the environment while doing so. (The effects on the environment may be good or bad.) Student teams will share this information in a 5-7 minute presentation, which needs to include at least ten relevant power-point slides and an additional visual aid.

ACTIVITIES	CURRICULUM STANDARDS	NETS PERFORMANCE INDICATORS
Choosing a topic of interest that shows how a scientific advancement has helped people solve a problem	Grade 9-12 History of Science I C 2	
Researching how science and technology have solved the identified problem	Grade 9-12 History of Science I C3	1,5
Researching how our environment has been effected by the solution of the problem	Grade 9-12 History of Science I C4 Earth and Space Science III A1	1,5
Identifying current or local issues regarding how the environment has been effected by the solution of the problem		1,5
Presenting relevant information to teacher or class in a 5-7 minute presentation including power-point slides and another visual aid		3,4

TOOLS AND RESOURCES:

Teacher will need instruction sheets for students to use to define and clarify project.
Please see my website (click on the “Teacher Stuff” Page)

<http://pages.mhlearningnetwork.com/amyhendrickson/>
(OR cut and paste the suggestion below)

Students will need access to media tools including the internet.
Students will need access to power-point production tools.
Students will need access to other “visual aid” tools, such as model building materials.

ASSESSMENT:

Please see above website (or following documents) for a “presentation evaluation” handout for you and for your students.

CREDITS (INCLUDING CONTACT INFORMATION):

If you’re interested or have further questions, feel free to email me at :

ahendrickson@isd2154.k12.mn.us

COMMENTS:

I have used this project for the past five years. It has been a good project to show that sometimes scientific advancements, while helping us in one way, also affect us in other ways that we have not considered. Just this year I have added the new requirement of the Power-Point presentation slides, in an effort to get students to use technology as a tool to help them communicate the information and ideas they discover while doing research. I have kept the requirement of another “visual aid” for the presentation, believing that there is still much value in a picture, a song, an object or a demonstration during a presentation, also.

SUGGESTED HANDOUTS / INSTRUCTIONS FOR PROJECT:

(Please feel free to “cut and paste” or print as you need.)

- 1. Student directions / introduction to project.**
- 2. Presentation Evaluation Checklist**

How Science Effects Us and Our Environment
Chemistry or Ecology Project
Student Directions

- 1. Choose a topic that interests your team and that shows how science and technology have helped people solve large societal problems or improve peoples' standards of living**

Some suggestions are:

- Electrical power generation using fossil fuels
- Electrical power generation using nuclear power
- Electrical power generation using hydro-electric methods
- The use of refrigeration, including air conditioning in buildings and automobiles
- Large scale irrigation
- Exploration for fossil fuels (locating, mining, and/or drilling)
- Automobile use
- Other forms of transportation
- Chemical fertilizers for improvement of food production
- Computer manufacturing and use
- Manufacturing processes for any consumer good
- Development of medicines
- Development of country defenses (military advancements?)
- Other science topics of interest (Need to be "OKed" by me)

- 2. Examine how this scientific development has "benefited" humans, but has also effected the environment (in either good or bad ways)**

Research background information on the topic:

- Information about the "who, what, where, why, when" type stuff – *what* was the problem facing people or society, *how* was the problem solved, *who* helped develop the solution, *what* is the solution, *where* is the solution used, *why* is it a good or useful solution to the problem, *when* was the solution implemented
- Include very specific information and statistics
- Include a chronological look (or timeline) regarding important dates / years about the problem and how it was solved

3. A thorough explanation of the science involved in the solution

The technical part of your project that shows very detailed science information regarding the solution to the problem. (Explain such things as chemical compounds created during processes or scientific explanations of why solutions work.)

4. An explanation of the effect that the scientific development has had on the environment

The technical part of your project that shows very detailed science information regarding how the environment is effected by the solution to the problem

5. Current Issues regarding the topic

- a. Include current (within 2 -3 years) events regarding the solution to the problem, the affects on the environment, and any new issues
- b. A local (within Minnesota) news piece regarding the topic

6. Prepare a 5-7 minute presentation about your problem, its solution, and the effects that the solution has had on the environment. Your presentation must include at least 10 relevant power-point slides to aid in your discussion, contributions from all team members, and an explanation as to why you choose the topic you did. An “A” presentation must include an addition presentation aid; for example, a picture, song, demonstration, video, or other creative presentation technique.

7. References used in the research of your project must be listed separately at the end of your presentation. Do not plagiarize information! Give credit to others who have done work regarding the topic.

Science and Environment Presentation Evaluation

Student Members _____

Topic _____ Start Time _____ End Time _____

Clear introduction to topic
(Background Information Given About Problem) _____ (10 pts)

Clear timeline related about topic
(Specific dates and why they are important) _____ (5 pts)

Clear explanation of environmental effects _____ (10 pts)

Thorough explanation of science behind topic _____ (15 pts)

Comments on current events regarding topic _____ (10 pts)

Explaining why group chose the topic _____ (5 pts)

Power Point Slides
Neat, easy to see, understand; relevant to topic _____ (15 pts)

Presentation Aid
Neat, easy to see, understand; relevant to topic _____ (10 pts)

Organized, practiced presentation _____ (10 pts)

Not reading much material directly _____ (10 pts)

All group members participating equally _____ (10 pts)

References; able to note where facts are taken from _____ (10 pts)

TOTAL _____ (120 pts)