



**NEW
TRIER**

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The Eco-Village Challenge

**A student investigation and
application of environmental
land use planning.**

April 18, 2007

New Trier High School



- **Two-campus high school located in Northfield and Winnetka, Illinois, USA.**
- **2006-2007 enrollment = 4,044 students**
- **Approximately 98% attend college**
- **Comprehensive 4-year curriculum**
- **Motto: “Commit minds to inquiry, hearts to compassion, and lives to the service of humanity®.”**

Science Department

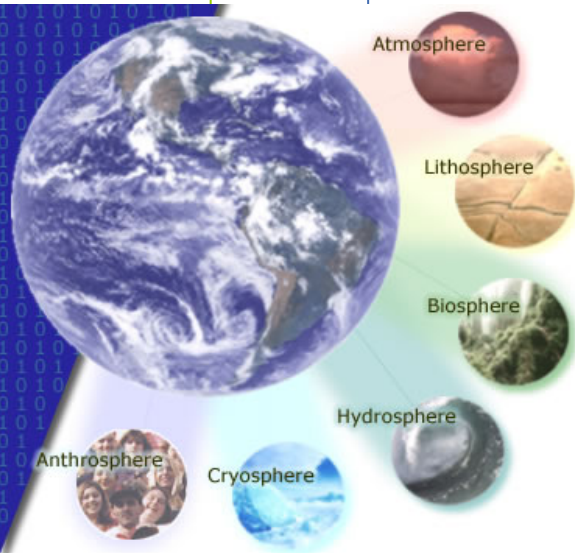
- **2 year science requirement**
 - 1 year of biology
 - 1 year of physical science
- **Most students take 3-4 years of science.**
- **Course offerings include biology, chemistry, physics, environmental geoscience, and other elective classes.**



Course Overview

- **Environmental Geoscience**

- Introduces essential earth science topics and relationships between the earth's spheres.
- Target age group is 14-17 yrs.
- Course is offered at a variety of levels based on ability.



The Eco-Village Challenge

- **Rationale – Global Citizenship**

- Use knowledge from topics covered throughout the year to address the final question in the course:

“What can we do to help repair and preserve the beauty and health of our planet?”



Introduction of Project

- **Environmental Issues and Examples of Solutions**
 - Investigate earth's renewable and nonrenewable resources.
 - Review current environmental issues and use various media sources to illustrate ways people are facilitating change.
 - CNN Presents program, "Melting Point: Tracking The Global Warming Threat."



The Eco-Village Challenge

• Project Overview

- **Research** eco-friendly methods of energy production, transportation, residential living, and waste disposal.
- **Design** and **construct 3-D** map/model of a village.
- **Develop** a village charter.

Name: _____ Period: _____ Date: _____

The Eco-Village Challenge

“What can we do to help repair and preserve the beauty and health of our planet?”

THE CHALLENGE

Your challenge is to develop an eco-friendly village. Your village needs to be designed so that it produces and uses its energy efficiently as well as conserves its resources. Additionally, your village needs to be designed so that it has minimal impact on the earth (low greenhouse gas emissions, low air and water pollution, etc.) There are FOUR categories that need to be addressed in the development of your village:

- **ENERGY:** Describe what type of energy source(s) is used to power your village. Decide where your village would have to be located for the type(s) of energy you want to use.
- **TRANSPORTATION:** Since cars emit a large amount of carbon dioxide, decide what kind of transportation alternatives you can use in your village.
- **RESIDENTIAL LIVING:** Decide how you would design the residential areas of your village so they consume less energy. Think about the design and location of the homes so that they conserve the most energy.
- **WASTE MANAGEMENT:** Unfortunately your village will consume products and therefore produce trash. Describe what your village will do to reduce the amount of trash produced and what it will do with the trash that it does produce.

PROJECT OVERVIEW

Your group needs to produce two products:

- (1) **Village Map/Model:** a detailed, colorful, labeled model showing the location of roads, buildings, homes, “green spaces”, etc. Your map/model needs to show the entire layout of the village as it relates to the four categories: Energy, Transportation, Residential Living, and Waste Management.
- (2) **Village Charter:** a typed document containing a brief description of the village (include a name for your village), ordinances that ensure the citizens live an environmentally conscience life, and information on its eco-friendly attributes (Energy, Transportation, Residential Living, and waste Management).

DUE DATE: _____

The Eco-Village Challenge

- **Project Overview (continued)**

- Approx. 4 students per group

- Timeframe

- 2 days –research

- 3 days – model construction and draft village charter.

- 1 day – Eco-Village Exhibition

- Resources needed

- Computers

- “Recycled” supplies from home to construct village.



Eco-Village Research Topics

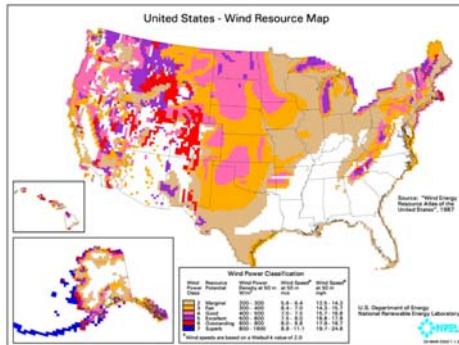
- **Energy**
- **Transportation**
- **Residential Living**
- **Waste Management**

Eco-Village Research Topics

- **Topic #1: Energy**

- Consider and evaluate possible alternative energy strategies.
 - solar, wind, biomass, geothermal, hydroelectric, nuclear, etc.

- Conduct a basic feasibility study to determine an optimal location of a village.



Eco-Village Research Topics

- **Topic #2 - Transportation**

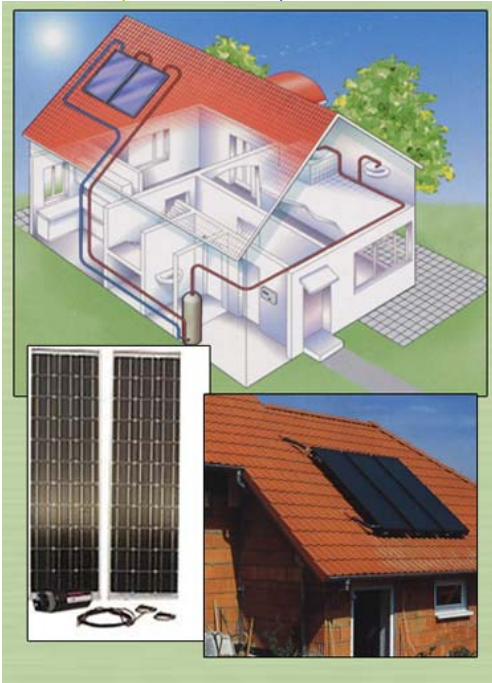
- Consider and evaluate possible alternative transportation strategies
 - public transportation systems, hybrid vehicles, renewable fuels, bicycle and pedestrian paths, etc.
- Plan a village layout that incorporates effective alternative transportation strategies.



Eco-Village Research Topics

- **Topic #3 - Residential Living**

- Consider and evaluate possible “green” alternatives to residential living
 - energy efficient appliances, energy efficient construction and design, heating and cooling alternatives, community living, etc.
- Plan a village layout that incorporates effective, energy-efficient residential living strategies.



Eco-Village Research Topics

- **Topic #4 - Waste Management**

- Consider and evaluate possible “green” alternatives to product consumption and waste disposal.
 - reduce consumption levels, consider products consumed, resource recovery, recycle, compost, bioreactor landfills, etc.
- Consider and plan a village layout that incorporates effective, energy-efficient waste management strategies.



Eco-Village Map/Model



- **Brainstorm and draft layout on poster paper**
- **Gather appropriate materials**
 - Encourage use of materials from home (recycling bins, old toys, etc.)
- **Construct village model**
- **Include descriptive labels on each component**
- **Include village name on “billboard”.**

Sample Eco-Village Map/Model

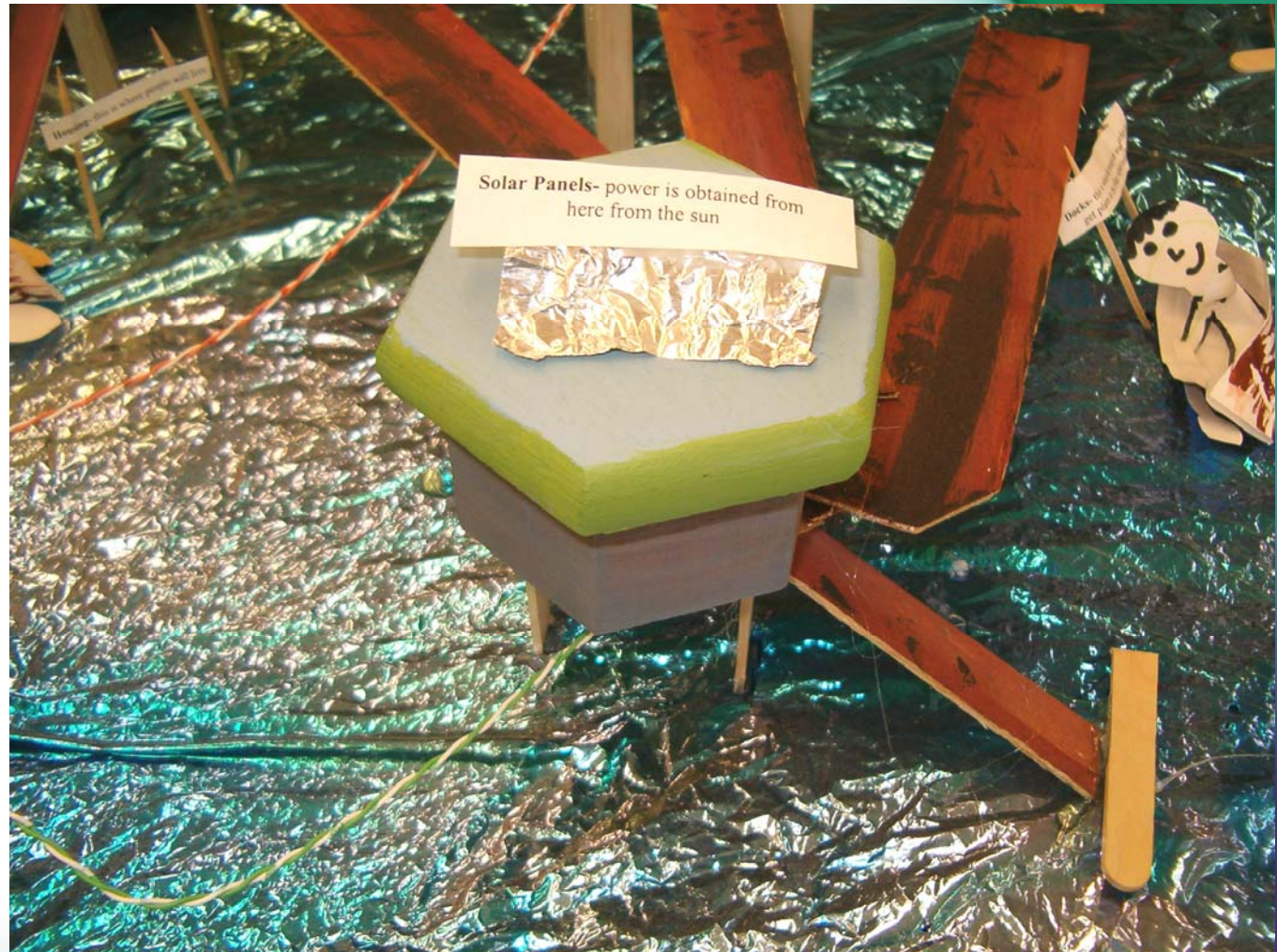
Eco-Village setting in Rocky Mountains



Composting (Waste Management)



Solar Power (Energy Source)



Hydroelectric (Energy Source)



Sample Eco-Village Map/Model

Eco-Village setting
in Oregon, U.S.



Eco-Village Charter

- Divided into four sections:
 - Section 1: Village Description
 - Section 2: Eco-Friendly Attributes
 - Section 3: Village Ordinances
 - Section 4: Resources

Eco-Village Charter

Names of Village Developers (Your Names)

Section 1: Village Description

Write one paragraph including the following information:

1. **NAME of village:** Choose a village name that in some way represents some aspect of your village.
2. **LOCATION of village:** Choose a specific state in the U.S. where your village will be located. Determine your geographic location by researching the BEST place for the type of energy source your village will use. Include a map that shows where in the world your village will be located.
3. **MISSION of your village:** When describing the mission of your village focus on what you are your fellow citizens hope to accomplish by trying to live an eco-friendly life.

Section 2: Eco-Friendly Attributes

In this section you will describe in detail how your village will address environmental issues related to the four categories below. You should write a separate subsection (as shown below) for each category.

- **Energy:** Describe in this section what type of eco-friendly energy resource(s) your village will use.
 - First, describe why the location you chose for your village is appropriate. Support your decision by including data (resource maps) about your geographic location that proves your energy alternative(s) will be appropriate.
 - Second, explain how your energy resource(s) works. For instance, if you will be utilizing wind power, explain HOW energy is produced by harnessing wind.
- **Transportation:** Describe in this section what types of transportation alternatives your village is going to use.
 - Describe what forms of public transportation your village will use and why it is eco-friendly.
 - Describe what forms of personal transportation alternatives your villagers will use and why they are eco-friendly.
 - Explain how you decided where public and private transportation routes would go. Include information about bike paths, walking paths, etc. if used as part of your private transportation alternatives.

Charter: Section 1

- **Village Description**

- 1 paragraph describing:

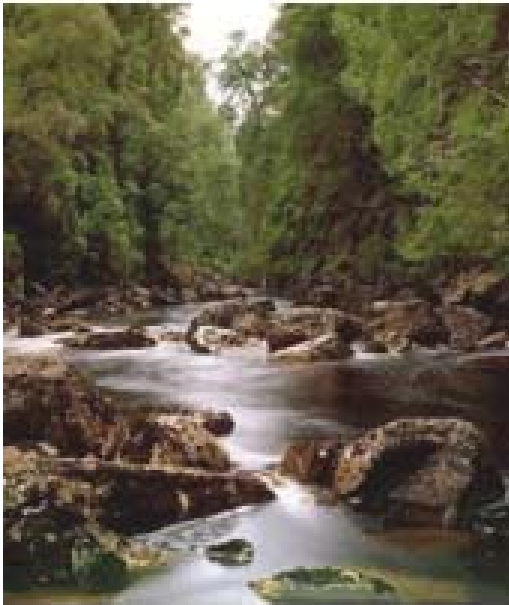
- Name of village
 - Geographic location
 - Mission



Charter: Section 2

- Eco-Friendly Attributes

- Largest section
- Divided into 4 subsections. In each subsection provide detailed description of eco-friendly attributes utilized.
 - Energy
 - Transportation
 - Residential Living
 - Waste Management



Charter: Section 3

- Village Ordinances

- Create a minimum of 5 village ordinances that can be used to ensure minimum-impact focus on the environment.
- Include description incentive programs and citations that would be issued if ordinances were not followed.



Charter: Section 4

- Resources
 - Bibliographic citations for all resources used during research for the model and charter.

Monitoring Progress

- **Checklist/Grade Sheet**

- Each group receives a checklist to help them monitor their own progress and help ensure timely completion of the project.
- Checklist also serves as grade sheet when model and charter are evaluated.

Eco-Village Check List / Grade Sheet

The entire project is due _____. In addition to being ready to present your Eco-Village to the class, your group should use the following checklist to ensure you have the products completed.

Eco-Village Map/Model

- _____ • Layout of **ENTIRE** village is shown, including:
 - Energy Source(s), including any special location needs (i.e. river valley for hydroelectric)
 - Transportation routes / special needs
 - Residential area, including individual houses
 - Waste management system
- _____ • All components listed above are clearly labeled with brief descriptions
- _____ • Map / model is neat, colorful, and at least poster-sized
- _____ • Village name clearly appears on map/model
- _____ • Village Developer names (your names) clearly appear on map / model

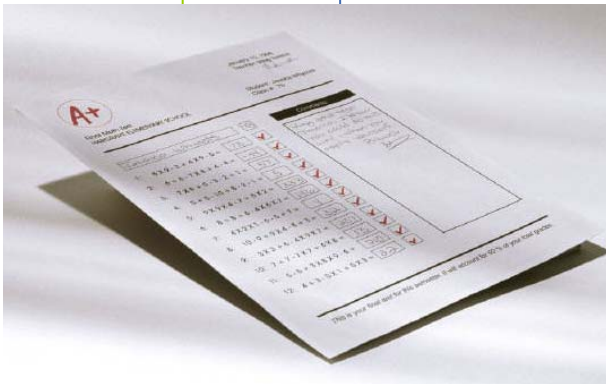
Eco-Village Charter

- _____ • Title and Developer Names located at top of charter.
- _____ • Section 1: Village Description complete, including your Village Name, Village Location, and Village Mission
- _____ • Section 2: Detailed descriptions of Eco-Friendly attributes complete (energy, transportation, residential living, and waste management).
- _____ • Section 3: Village Ordinances complete, including a minimum of 5 detailed laws/ordinances that focus on enforcing your mission.
- _____ • Section 4: Resources complete and listings are in proper APA format.
- _____ • Entire Eco-Village Charter is typed, spell checked, and follows specified format.

Evaluation

- **Eco-Village Exhibition**

- Each group will display their project in a public space at the school.
- Other classes visit the exhibition and learn about eco-friendly living.
- Each group conducts a presentation during the exhibition and turns in a final Eco-Village Charter.



The Reality



**The fate of our planet is in
the hands of our youth.**

**Inspire creativity and
encourage innovation.**

Name: _____ Period: _____ Date: _____

The Eco-Village Challenge

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THE CHALLENGE

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DUE DATE: _____

MATERIALS

Your group will be responsible for supplying most of the materials needed to construct your model. Think eco-friendly when planning what materials to use. Look through your house for items that can be “recycled” and “reused” for this activity. Recycled packaging products and even old toys make some of the best supplies for this activity. Materials such as glue, markers, scissors, and tape will be provided in class.

TIMELINE

You will spend one week researching, constructing, and the drafting of your document in class. Several days have been set aside in the library and computer lab. Despite the large amount of class time being devoted to this project, you will still need to put in some quality time outside of school in order to meet your deadline.

Possible starting points for your research are:

- U.S. Department of Energy’s Energy Efficiency and Renewable Energy website (<http://www.eere.energy.gov/>)
- United States Environmental Protection Agency’s High School Environmental Center website (<http://www.epa.gov/highschool/>)

EVALUATION

You will have an Eco-Village Exhibition during our class in the 3rd floor walkway between buildings A and D. Other classes will be encouraged to visit our exhibition and learn about eco-friendly living. During the exhibition I will visit each group and you will present your Eco-Village for evaluation. You will also turn in a final copy of the charter (one per group) at the time of your evaluation.

Eco-Village Charter

Names of Village Developers (Your Names)

Section 1: Village Description

Write one paragraph including the following information:

1. **NAME of village:** Choose a village name that in some way represents some aspect of your village.
2. **LOCATION of village:** Choose a specific state in the U.S. where your village will be located. Determine your geographic location by researching the BEST place for the type of energy source your village will use. Include a map that shows where in the world your village will be located.
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- **Residential Living:** *Describe* in this section how the homes will be designed so that they maximize their energy efficiency and conserve the most energy. Discuss techniques that promote “green living”.
 - Discuss how the homes will be designed and oriented so that when they are constructed they will be energy efficient.
 - Discuss energy conservation techniques that can be used by the homeowners while they are living in the homes.
- **Waste Management:** *Describe* in this section how trash disposal will be addressed. Trash is considered to be any solid waste that you discard. This could include anything from packaging materials (bottles, cans, boxes) to food scraps.
 - Describe eco-friendly alternatives for trash disposal.
 - Describe methods of resource conservation that result in an overall reduction in the amount of trash produced.

Section 3: Village Ordinances

In this section you will list and describe a minimum of 5 ordinances that the citizens will be expected to live by to maintain a minimum-impact focus on the environment. Include information about what happens if these ordinances are broken. Possible ways to help enforce ordinances might be through incentive programs and/or fines.

Section 4: Bibliography

This section is an APA formatted bibliographic listing of all resources used during your research process.

Note: Try to include diagrams and pictures in your charter to help illustrate what you are trying to explain.

Eco-Village Check List / Grade Sheet

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Resources

Cassidy, M. (2007, January 18). Bold plan for new eco-village. In *BBC News*. Retrieved April 5, 2007, from BBC Web site:
http://news.bbc.co.uk/2/hi/uk_news/northern_ireland/6276373.stm

Institute for Computational Earth System Science. (2002). Spot at UCSB. In *ICESS*. Retrieved April 5, 2007, from University of California, Santa Barbara Web site: <http://http://www.icesb.edu/>

Jones Nash. (2005). Solar Electricity and Solar Hot Water. In *Jones Nash Eco Homes*. Retrieved April 5, 2007, from Jones Nash Web site:
<http://http://www.eco-houses.co.uk/solar-electricity-power-eco-home.htm>

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