



Environmental Action: Find the Solution

Summary: In small groups (3-4 students per group), students are to tackle real life ecological/environmental problems try to come up with the “best” solution.

Background Information:

Students will face in their future many choices as citizens of a planet under many different demands. Situations such as Casa del Pueblo and the Crandon Mine mean making difficult decisions as a citizenry. People need to make a living. Is the living worthwhile if we do not have a clean environment? What are the long-term effects if a habitat is destroyed or changed? What else gets changed? For example, the area of Casa del Pueblo supplies fresh water for over a million people. If the land had been mined, this water would have been lost, land would have been eroded beyond the boundaries of the proposed mines and people displaced forever.

In the local area ground water is a big issue. There is a pipeline supplying water to Green Bay with the source in Manitowoc. What happens when more communities want/need to draw from the same source? Shore lines are in short supply and are overused. Manitowoc county borders Lake Michigan. What type of development plan decides who gets to use this valuable resource? What about lakefront property and public rights vs. private property owners?

Add to these issues the problems of waste disposal (Whitelaw dump), runoff, waste runoff from farms and businesses into the ground water and then natural disasters such as tsunamis, hurricanes, tornadoes and flooding.

Materials:

- Lesson plan for instructor
- Data on different scenarios
- Paper and pencil for student notes
- Computers with Internet access if available (optional)

Set-Up:

Today students are going to apply values and choices based on science to real life problems. Students will be working in small groups to come up with the **least harmful solution** to a given problem.

Give the students part one of the activity. After they have discussed in and are close to a solution, present part 2. Let them work on a solution for that before they are presented with any part 3.

Grade Level: This activity is for 9th and 10th grade students but can easily be adapted up or down.

Goal: Students will evaluate problems faced by different communities and attempt to evaluate and come to a compromise among ecological, environmental, organism, human, and economic needs.

Key Concepts:

Biodiversity
Environmental issues
Ecological balance
Economic needs
Interrelationships

Objectives: Upon completion of this lesson, students will:

- 1) Evaluate all aspects of natural and/or human affects on a local environment.
- 2) Investigate how current plans or proposals concerning resource management will have an impact on the environment, ecology, and quality of life in an area.
- 3) Advocate a solution or combination of solutions to the problem.

Teaching Location:

Classroom

Lesson Time:

Two or three 45-minute class periods or longer depending on depth chosen to take assignment. I plan on using this when I have a substitute teacher – they start, I will finish.

Subject Areas for Infusion:

Economics, Biology, Social Studies, Ethics, Quality of life, Math, English

Standards:

Science: A, B, C, G, H

Environmental Education:

A. Questioning and Analysis

B. Knowledge of

Environmental Processes and Systems

C. Environmental Issue Investigation Skills

D. Decision and Action Skills

E. Personal and Civic Responsibility

Procedure:

Introduction.

Read or go over background information. Lead a general discussion of concerns that must be faced by people in areas where these situations exist. Students or teacher can put some of these on the board so students can refer to them while they work in small groups.

The problems that face Manitowoc County and Wisconsin are not unique in the world. They are problems that are faced by people all over the world. Those problems we are not currently facing here may very well make their way to us, or a location we choose to live in the future. Individual citizens have made differences in the outcome of these types of situations. People also make a difference in how they choose to vote, or **if** they choose not to vote. (Deciding to do nothing is still making a decision or acting on a problem).

Note the use of the words “least harmful solution”. Because of long reaching ramifications of any decision, there will not be a decision that will not cause one of the following: economic, environmental, personal, and /or quality of life harm. Anything chosen is going to change biodiversity and upset environmental balances.

Activity 1.

1. Your county has been found to have 1.9 billion dollars worth of minerals under the topsoil. It will take 20 years to mine. All citizens living in the county will need to relocate out of the area except for one tenth of the population who will be employed by the mine. Mining for this mineral will totally destroy all of the topsoil in the county. Expect problems with erosion into the nearby lake.
2. The mining company will be using many chemicals poisonous to the environment and dynamite to mine this mineral. Mining equipment will compact the soil to the point where even with the laws regarding restoration, it will be too compacted/damaged to grow any crops on for the next 40 years after the mine is closed. The chemicals used have leaked into the groundwater and surrounding lakes in other mines that this company operates in different sites.
3. This affects your home, your farm, and your job. You can no longer do the job you have, the company you work will rebuild in China if forced to close to accommodate the mining company. You will be offered the assessed value for your home and no more. You will be forced to accept that if the company goes through because your property will be condemned through provisions in the law for eminent domain.
4. There are 4 species of insects, 8 of, and 35 of plants that will become extinct if the mine goes through.
5. Be prepared to present and defend your solution and any plan of action to your fellow citizens (classmates).

Notes

Casa del Pueblo and Manuabo in Puerto Rico and the Crandon Mine in Wisconsin are situations that were very similar to this. How did citizens fight off the government and mining companies?

Activity 2.

1. A private conglomerate has quietly bought up the remaining beachfront in your area. They have now come into the open and are petitioning to buy up all the local parks and natural areas that have lakefront property. They are planning some high-density vacation homes for the wealthy citizens of Chicago and other tourists who come to the area to enjoy the beach. They point out that this enterprise will create work for five thousand people. (They don't advertise that these jobs will be mainly as maintenance, maids, day care, and other minimum wage jobs).
2. You have a friend in the company who has supplied you with evidence that the beaches will be completely closed to the public once they have ownership. There will no longer be any public beaches available for launching boats, fishing from docks/piers, swimming, picnics, etc. There will

be a hefty daily fee to use beaches to keep out the “riff-raff”. Employees will not be given access to the beaches.

3. In addition to closing and developing the beachfront, they will be building their own private electric plant. Discharge will change the temperature of the water causing many fishes to decline or die out. This will also cause changes in the food chain. The closing of the beach will cause the extinction of 4 species of crabs, 2 of turtles, and unknown other effects on the remaining plant and animal life in the area. If this is ocean front area, it will also destroy the coral reef through overuse of boats and Jet Ski’s. This causes further die off of species. All waterfront-based wildlife will be displaced.

4. Areas outside the immediate development will not be allowed access to water for a drinking source. The corporation has decided to run their private wastewater treatment plant with only secondary treatment. All discharge will be allowed to flow directly into the water (at an “appropriate distance” from shore).

Notes

Manuabo, Puerto Rico has faced this problem, as have many areas in Hawaii, and other areas with coasts. This situation is destroying many coral reefs and causing the endangerment of many species. (Manatee, mangroves, etc).

Activity 3

1. The local mega farm has been distributing manure on open fields. At this point the local hairdresser noticed that many of the women coming in to have their hair done smelled like they were coming in straight from the barn. After a little more research she has discovered that the tap water is what smells like manure. After notifying authorities and with follow up testing it has been discovered that one third of the wells in the village are contaminated.

The farmer employs about 30 people from the village and is a huge portion of the tax base for the community. He has agreed to quit spreading manure during certain months but cannot store manure forever. In addition, it has been discovered that Karst (limestone rock that when erodes forms fissures, sinkholes, underground caverns and streams) is prevalent in the area. Digging new wells will not work for many homeowners because the underground water source is contaminated. The farmer refuses to pay for drilling of new wells because he/she considers the situation to be a natural occurring phenomenon, and therefore not their fault. You are the members of the town board. How do you address this problem and serve both the farmer and the citizens of the community.

2. One of the underground streams supports a new species of blind fish and 2 species of crabs thought to be extinct. They are now placed in further danger due to the pollution of their habitat.

3. Of the town board members half of you have contaminated wells, the other half are clean as far as the E. coli count, but you have extremely high levels of nitrates (associated with fertilizers, water with high nitrate levels cannot be used for babies and senior citizens and should not be used for foods).

Notes

The scenario presented in 1 duplicates what happened in Wayside of Brown County Wisconsin, just over the Manitowoc County line in the spring of 2006. The DNR tested all wells in the township and as of this writing are still working on a solution.

Activity 4

1. The local dump is full and they are looking at placing a new one in your community. The last one is starting to have some problems with leakage. The plan is to build the new one in the same manner.

2. This dump will be using ten of each of your group member’s acreage. That means the road in front of your house will be used for garbage trucks bring garbage to the dump. Also, due to low state tipping fees, trucks from other states will be bringing in garbage. This garbage is from a state that does not follow the same recycling practices that Wisconsin does.

3. The old dump leaks and is causing ground water contamination. In addition to home wells, it is leaking into the local lakes and rivers. The new dump may likely do the same.

4. The dump area is part of a good hunting area. In addition it is the one of two places in the state where the native chestnut tree still grows in this country. The waste management company argues that this site is the only place that they can minimize run-off from. They promise that they will create about 40 jobs in the local area.

5. An endangered species of bird will become extinct if the chestnut trees die.

Notes

Whitelaw area, part of our school district has problems with the landfill. Many landfills near the Illinois border face problems of garbage being imported into the state. Federal court has not allowed Wisconsin to ban the garbage nor to require Illinois to recycle to the extent that Wisconsin does.

Activity 5

1. The tsunami has destroyed all of the building along the coastline. (Or a tornado has destroyed your village). Living in an area where this is likely to happen again, what changes will you make, how will you change your building codes, and how do you plan on rebuilding.

2. The natural disaster that has hit your community has destroyed the habitat of several species in your area. Because they lack their food sources, they may not survive. How do you plan for these species in the future? Three bird species and two mammal species are endangered due to two species of trees being destroyed; also three aquatic species are endangered. If these species are not brought back this will alter the hunting patterns in your community in the future and not for the better. It will also cause tourists who come to your area to view two of these species to no longer come, causing loss of income for many in your community.

3. While you plan for the future you must deal with increased cases of illness due to insect born illnesses and contaminated water. This year is a total loss in regards to tourist income and no food will be harvested during the hunting season. How do you ensure this will not happen in the years to come?

Notes

Similar to situations being faced in Indonesia right now. The St. Nazianz area was hit hard by a tornado that stripped all trees of leaves causing many trees to die in the next couple of years. The wildlife in the area is still recuperating from the damage done.

Conclusion.

There are not any easy answers. Students must present a solution that they feel best fits the problem. They are allowed to present a solution, go back into their groups and re-work the solution after total group input. Easy sell-outs are not allowed. Students who opt for this solution will have to come up with a plan for the people they relocate and eject from their homes.

Assessment. How will you determine if your objectives have been met? Try to use a variety of authentic assessment strategies.

Adaptations: Pick groups using popsicle sticks with student names, leave out economic factors, reduce expectations of the argument or shorten time period for students to work on solutions. To make more challenging, extend time and have student bring in news articles or where similar situations are occurring and what solutions local residents are using to cope with the problems.

References: I used information in my journal and gathered from the trip to Puerto Rico as well as incidental articles with information about the local environment.
Internet