Plan an Earth Day...Teach with an Environmental Theme*

What is the use of a house if you haven't got a tolerable planet to put it on?
Henry David Thoreau

By Joan Wagner

On April 22, 1970, the first Earth Day was held. I was fortunate enough to participate in this historical event that brought new awareness to the issue of how human activity affects our planet. The impact of this day, celebrated across the country cannot be overstated. The *Clean Water Bill* and the *Clean Air Act* were passed. In December of that year, the Environmental Protection Agency (EPA) was established. Now our government was provided an environmental arm, and with it, an environmental conscience. In fact, in many ways, Earth Day gave birth to the then nascent discipline we call environmental science. At the time of my participation in this first Earth Day celebration, I did not realize how it would affect what I would do in the classroom.

In 1971, after teaching Regents biology on Long Island for four years, my husband and I, with our newborn son, moved to upstate New York. When my son was two years old, I took a job with the Burnt Hills-Ballston Lake Central School District teaching 7th grade life science. Teaching junior high, as it was called back then, brought new challenges to me. I thought about the many environmental issues facing our planet, and how I could use them to teach life science. The idea of holding a school-based Earth Day exhibit where-by students display projects related to the environment hatched a few years after I began teaching there. The unit that I developed was built around three interconnected themes: ecological processes, ecological problems, and ecological solutions. Students cannot understand why there are problems or how to address the problems until a basic foundation about the workings of the environment is understood. After that, problems and potential solutions were discussed and tackled (**Table A).**

Early on in my professional career as an educator I learned that if you plan an event in which students are to participate, and be evaluated, it is tantamount that information about the activity be publicized well in advance. Hence from the first week of school, students knew that this event was going to transpire. Before the unit began, informative environmental posters were hung-up around the classroom. When the ecology study began, students received a packet of information about the new unit. My introduction to the students said, "We are going to embark on a study of ecology. Ecology is derived from the Greek words *eco* (house) and *logos* (study of). Undoubtedly, our 'house' that we all inhabit in this world is a very complex structure. In this unit, we will try to understand how this 'house' is built, how it operates and how we can best live in it with the least wear and tear." A description of the topics as noted in **Table A** was included.

The culminating product displayed by the students could be in one or more of the following formats: Poster, diorama, working or non-working models, and samples of environmentally sound products. All students were expected to thoroughly research their topics and perform experiments when appropriate. Since the projects were to go on display, I suggested they use museum displays as a model of how to assemble their own exhibit. I saved superior exhibits and used them as samples to show the students over the years. A bibliography had to be included. Today students would be able to add powerpoints, etc to their display.

The students and I recruited members of the faculty to be judges who identify the most outstanding projects. A rubric was generated for them to use. Trophies were provided to the students with the outstanding projects. Students, faculty and administrators visited the exhibits during the day. Some local schools sent students to our Earth Day as part of a field trip. Most

Table A Ecological Processes, Problems and Solutions

Processes

- Biotic factors
- Abiotic factors
- Life cycles
- Cycling of chemicals; i.e., carbon cycle
- Balance of nature
- Animal nutrition
- Food chains, webs
- Succession and climax communities
- Biosphere
- Biomes
- Community
- Ecosystem
- Producers, consumers, decomposers

Problems

Human activity's affect on plants and animals

- Destruction of habitat
- Water and air pollution
- Burning of tropical rain forests
- Farming practices such as use of antibiotics, pesticides
- Overfishing

Forms of pollution

- Water, including thermal pollution
- Air, including global warming
- Noise
- Solid waste disposal
- Nuclear waste disposal
- Toxic waste disposal

Use of natural resources

- Water
- Oil and coal
- Top soil loss due to poor farming practices and erosion

Overpopulation
Oil spills
Coal mining disasters
Food shortages in highly populated areas
Pandemic diseases; AIDs, Avian Flu
Sanitation

Solutions

Practice conservation

- Animal preserves, tree farms
- Practice 3 R's (Reduce, Reuse, Recycle)

Education
Alternative Energy
Increase mileage for cars
Harness the oceans for food and generating energy
Improved health care
Regulations to reduce land, air and water pollution
Prudent land development
Sound farming practices
Stabilize world population

important was that students in all of my classes participated in some capacity in the planning of the event such as writing invitations, preparing judge badges, exhibit numbers, etc. It was truly a cooperative project on all levels. The students had "ownership" of the project.

The environmental topics studied tie in nicely with the National Standards in Science Education and the Benchmarks for Science Literacy which the MST standards are based upon:

Plant Succession
Food Pyramids (food chains and webs)
Abiotic cycles, i.e. oxygen-carbon dioxide, nitrogen cycle, water cycle
Balance of nature concept
Prey-predator relationships
Biomes
Ecosystem
Ecological niche
Population science
Contemporary environmental problems

- Water pollution (heavy medals, PCBs, pesticides, herbicides, etc)
- Land use (developments, etc)
- Waste management
- Energy use
- Global warming
- Farming practices
- Epidemics
- Population growth

The ecology packet provides guidelines on how to prepare their projects such as any reports they may write or visual displays. The general student directions state:

- All written work must be word processed
- All laboratory work must be done accurately and displayed in a manner that can easily be understood. (Since

I ran a very hands-on classroom, students had considerable experience in conducting experiments).

- All work that involves research must include a bibliography. My school district, under the direction of the librarian has developed a brochure on how to write a bibliography. Hence, students were to use the school's format.

Since the study of the environment will involve students learning a vocabulary of terms, I had provided a list of terms that they should understand by the close of the unit. I told my students that I would not ask them to define the terms, but the terms may be used in a question. Therefore, they will need to develop a scientific vocabulary in order to more accurately discuss scientific concepts. **Table B** list the terms the student would learn in the course of the unit.

Table B
Environmental Terms
Biosphere
Biome
Ecosystem
Niche
Population
Community
Dominant
Food Chain
Food webs
Food Pyramid
Biotic Factors
Abiotic Factors
Producers
Primary Consumers
Secondary Consumers
Decomposers
Climax Community
Conservation
Endangered Species
Extinct
Erosion
Toxic Magnification

In order for the students to have a handle on the type of problems facing the environment, and examples of initiatives to ameliorate them, students received a brochure with information about these topics. However, today, with easy access to the Internet, students could easily research the problems facing our environment and potential solutions. One student in my class, who was artistically talented created a political cartoon for the cover of the brochure.

The brochure that was provided to the students included information on the following topics:

- Toxic chemical threatening wildlife
- List of threatened wildlife
- Acid Rain Pollution
- Habitat loss
- Hunting Laws
- Water Pollution
- Air Pollution
- List of organizations that protect and monitor the environment
- Laws that protect the environment
- Programs to help wildlife

I am not making available a copy of the brochure since it needs updating. I suggest a simple version of this brochure with suggested websites for information.

During the period of time this unit ran, I worked with the librarian to help students find reference materials. I visited the New York State Department of Conservation (DEC) and obtained many copies of pamphlets and brochures that added to reference materials students could use. DEC was very willing to provide their free literature. Part of my room was set aside as a mini-reference center. Perhaps a computer could bookmark suggested websites.

When I ran the Earth Days, my school was organized into interdisciplinary teams. Students had a period called "draw-off" in which they can sign up to see teachers or a teacher can draw them off to make up work or receive extra help. This was in lieu of a study hall. Since

there were a number of periods a week in which all of my students were in the same room, I used that time to bring in speakers to talk on issues related to the environment. I often obtained speakers from the Department of Environmental Conservation (DEC) and the New York Public Interest Policy Group (NYPIRG).

Organizing the Exhibit Day

The most important step in organizing a major event is clear communication. The entire faculty should be aware of the day. Since students will need to miss some of their classrooms, support from the faculty and administrators is imperative. Letters went out to the central administration, parents, faculty and support staff announcing that this event was to take place. A second letter invited these groups to the exhibits. Students who miss classes were responsible for making up the work. Since the exhibits would take place in the afternoon, all afternoon classes were invited to the exhibits. In order to avoid overcrowding, a schedule was set up for when a teacher could bring down their class to the exhibit hall. Of course, this was optional, but all teachers brought down their classes. Some even created an assignment from the experience.

TABLE C

Judge's Scoring Rubric Provide a score of 1-5 with 5 being the highest	Points
1. Information clearly presented	_____
2. Evidence of research (experiments, Bibliography)	_____
3. Quality of execution of exhibit	_____
4. Student understands concepts in exhibit	_____
5. General effort	_____

As noted earlier, some members of the faculty were invited to be judges. They were given a scoring rubric to follow (**Table C**). Trophies were ordered for the best projects. Some of the artistic students in my classes made judge badges. I created a map of the exhibit area so that all judges and visitors knew where to look for an exhibit. Since there were over 100 exhibits, each judge was responsible for evaluating 10 projects. Every project was reviewed by three different judges. I would recommend that all of this information be placed in an "Earth Day Program."

Schools always benefit from good PR. Since sports are covered by the press, why not academic events? I worked with the public relations person in central administration to receive some press and TV coverage. If no such person exists in your school district, then email the managing editor of your local newspapers and TV stations. They are always looking for stories. Each year, we received some form of coverage. Needless to say this type of recognition added to the excitement and satisfaction of the day for the students.

It is important to reserve a location in your school that can hold all of the exhibits. Since the cafeteria has tables, I used that room. If the day was relatively warm, some of the exhibits were placed outdoors. Students received from me a request form asking whether they wanted to be indoors or outdoors, if electricity was needed, etc. Obviously the solar energy exhibits worked much better outdoors. The request form also asked for the title of the project.

Before the morning of the Earth Day exhibits, students were provided with locations to store their project when they arrived. The principal of the school was very helpful in this matter. Many of the projects were stored in the principal's conference room.

The exhibits were open for review the last two periods of the academic school day. Students were given permission to set up their project 30 minutes before the exhibit was to begin. Since that entailed leaving a class, I cannot overstress the importance of communication. All students were given a special pass to leave their class to prepare for Earth Day.

Cleanup was done after school. I always organized a cleanup squad after the exhibits were torn down. Our school had an activity period so students would take the activity bus home. Special rides were set-up for the cleanup squad who stayed beyond the activity period. It is important to work with the custodial staff for the cleanup component of the day.

About six weeks before Earth Day, students received a packet of activities from which they can plan and develop their "museum displays." They could choose something else or modify what was in the packet, but anything not in the packet had to be approved by me for both safety reasons and for ensuring the student was on task.

When I held these Earth Day exhibits, there were no team projects. If you choose to include team projects, then the judging rubric needs to reflect that so that all members of the team show accountability. The first page of the packet contained an introduction to the unit (**Table D).** The packet of activities can be downloaded from one of the following websites: www.focusonlearningonline.com or www.Eastern-stanys.org>. The activities in the brochure have been updated to better reflect the world today and the resources that are available to students.

The Earth Day that I organized with my 7th grade life science classes helped to provide

Table D **Ecology Unit**

Purpose: To develop an understanding of Earth's ecology.

What is ecology? Ecology is the study of the relationship of living things to their environment.

Why Study Ecology?

(1) To give you an appreciation and understanding of the many ways in which organisms interact with the environment.
(2) To help you as a citizen to make intelligent decisions about the environment in which you live.

Already you must know that humankind is nature's worst enemy. S/he pollutes and uses up resources. Fortunately, there are people who are concerned about the quality of the air they breathe, water they drink and the land on which they live. They understand that there exists a very delicate *balance of nature* on this planet. Humankind has learned the hard way that all living things are dependent on one another. Using DDT to kill off insect populations backfired because it also killed birds, fish as it polluted the water. The Japanese beetle is a nuisance today because it was brought into this country free from its natural enemies. The same is true for the walking catfish of Florida. The construction of the Welland Canal in 1932 allowed the sea lamprey to migrate into the upper Great Lakes resulting in a dramatic decline in the population of the Lakes' trout. If we should kill off all of the rodents on this planet, it might make some squeamish people happy, but what will happen to all of the animals that are dependent on them as a source of food?

We tend to think of our present concern with conservation and pollution as just a recent interest, but this is not true. During the Elizabethan Age, a person could be beheaded for breaking laws related to horse dung and the burning of coal. In the United States, President Theodore Roosevelt showed leadership in the area of conservation.

This packet is separated into the three topics that we will be studying in ecology: processes, problems and solutions. Look through the packet carefully, reading each choice before you make your selections.

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