

TEACHING ELEMENTARY AND SECONDARY STUDENTS How to Care for the Earth

BY BRYAN NESS

As recently as 50 years ago there seemed to be no reason to be concerned about our environment. The air and water were apparently clean, forests appeared endless, and world population levels seemed manageable.

Our world is radically different today. Smog has become a household word and is no longer confined to large cities. Water pollution is widespread, from the Great Lakes to the Aral Sea, as well as in the groundwater of many communities. Our forests are rapidly shrinking, threatening the extinction of a number of animal and plant species. World population is increasing at an alarming rate and may reach 6.3 billion by the year 2000. Other problems, such as the greenhouse effect and ozone depletion, could have drastic effects on our planet as well as ourselves.

The mere fact that such appalling problems exist makes it imperative that we educate our young people about them. In order to deal with the serious environmental problems of our day, we must become more aware of them. However, we must also teach students how to think about ecology. Environmental problems are poorly understood by the general public, and the media often portray biased views of the problems.

Finally, as Christians, we have a God-given mandate to care for the earth. God told Adam and Eve to "have dominion over the fish of the sea and over the birds of the air and over every living thing that lives upon the face of the earth." God did not give this dominion so humanity could plunder the earth's resources. Rather, He intended that humans be stewards, to keep and protect the earth.

Environmental Education in the Curriculum

Unlike the college level, elementary or secondary education curriculum does not dedicate specific classes solely to environmental studies. This means that the topic must be integrated into other subjects.

Science. This is probably the easiest area in which to incorporate environmental education. This is especially true at the secondary level, where subjects are

taught by different teachers.

Many of our environmental problems result from violations of scientific principles. Simple experiments can teach these principles in the classroom.

For example, one cause of water pollution in many of our lakes and streams is overenrichment. This is usually caused by sewage or farm runoff. The process of overenrichment can be easily modelled in the classroom by using two aquaria or large jars filled with water. Put in one aquarium either a very small amount of fertilizer or none at all. Add a large amount of fertilizer to the other aquarium. The fertilized aquarium soon becomes choked with algae and slime, whereas the other aquarium only grows a small amount of algae. This type of visually oriented experiment helps students to understand ecological principles.

Bible. Environmental issues can be integrated into Bible classes as well. As students study the story of Creation, they can learn about their responsibility to care for the earth.

Language Arts. Students can write a letter to the

seems most appropriate to teach young people about these issues in context.

Individual or Class Projects

Students learn by observation and participation. Projects they design themselves can add an extra dimension to environmental education. Assignments can include individual, small group, or whole class participation. Projects should stress individual impact on the environment, especially at the local level. For this reason, activities like a personal garbage inventory will probably be more relevant for students than projects that deal with tropical rain-forest destruction or oil spills in Alaska.

Students should be required to write a final report about their projects. Older pupils can help the younger

ones to write the report if necessary. The projects should then be shared with others in the school, possibly by reporting the results in the school newspaper. If a student or class project is especially well done, the results should be shared with the community. Many local newspapers will print such material. This not only provides good public relations for the school, but also encourages the students to pursue environmental activities even after they are no longer required to earn a grade. Through student research and seminars, the school may also encourage the community to practice better stewardship of the earth.

School-wide Projects

In addition to individual and environmental education, class projects can also feature school-wide participation. This is the place to teach students by example and experience that they can be part of the solution to our environmental problems. School-wide projects can be as simple as a regularly scheduled litter patrol day for the school grounds or as ambitious as an ongoing clean-up of a community park or a stretch of highway.

A number of schools have embarked on successful environmental projects.

Writing letters to express concern about ecological concerns can combine language arts and environmental studies.

president/prime minister or a local or state/provincial government official expressing their concern about a particular environmental issue. Students can also write stories about what life would be like if the greenhouse effect occurs or if we run out of oil.

Social studies. Students can investigate the ways that people in various countries deal with garbage or how our ancestors disposed of waste. Another social studies unit could look at the ways other cultures (both past and present) have exploited the earth. Such study could include discussion of how such actions have affected the environment.

Mathematics. Depending on the grade level, environmental topics can be integrated into math in a variety of ways. Computing how much electricity the school or classroom consumes or estimating how much gasoline is burned in delivering all the students to school each day could be projects for older students. Making a bar graph or pie chart of the kinds of litter found in the playground or of the kinds of garbage thrown away by each classroom is a project younger students would enjoy.

Art. Art is also an easy subject with which to integrate environmental con-

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cerns. Students can be asked to design posters or bumper stickers with an environmental message. They can also devise art projects using recyclable materials. Making recycled paper and then using it to create a piece of art is also fun for students.

The key to integrating environmental topics with other school subjects is creativity. Environmental problems affect all parts of our lives; therefore, it

The Alcott Elementary School in Concord, Massachusetts, began a composting project as a part of an Earth Day celebration. Instead of throwing away all the food scraps from their cafeteria, they now compost them. As a result, they produce high quality compost for the school's flower beds. They also give some to the community and a local organic farm. The school cafeteria's waste output has gone down from about 25 garbage bags a day to only three or four.

As a result of a trash study by four students led by English teacher Judy Collishaw in the Richmond School in New Hampshire, the entire school launched a recycling program. Money received from the recyclables was used to offset project costs. The experiment was so successful that recycling programs were instituted at three other schools in the same district.

Resources

Books and magazines. Because of the heightened interest in environmental problems, books have been produced for every age level. Most focus on practical things people can do to help the environment. An annotated list is found on page 17.

A number of children's magazines also deal with environmental topics. Those are your best source of current information. If you do not already receive the magazines listed in this article, get at least one subscription to circulate to the various classrooms. Assigning outside reading from magazines or even the local newspaper can make students more conscious of current environmental issues.

Videos

Numerous videos are now available on environmental topics, although most are adult-level productions. Some videos are appropriate for fifth or sixth grade and up, but hardly any are available for younger children. Only a few videos are listed here, all of which I have previewed. Your local public library can be a good source of inexpensive videos for schools. Preview them ahead of time to be sure they are not overly biased or inappropriate for the age level of your class. Some videos produced by certain environmen-

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tal organizations present a very one-sided view.

Field Trips

Field trips to the local landfill or sewage-treatment plant can help students understand where waste goes. Confronted with the problem in this tangible way, young people may be more willing to help reduce solid waste and waste water production.

A local recycling plant is also a good place for a field trip. Such a visit could supplement class discussions or a school recycling project. Other possible field trip destinations: farms that use environ-

mentally safe methods, a nature center operated by a conservation organization, such as the Audubon Society or Nature Conservancy, or an energy production facility, such as a dam or coal-powered electric plant. Even a trip to the grocery store to study packaging and waste reduction can be rewarding.

Conclusion

Because of the grave environmental problems facing us, we must teach our young people about proper stewardship of the earth. In the elementary and secondary school setting, this is best accomplished by integrating environmental topics with other subjects. One of the best approaches for teaching environmental awareness and responsibility is through participation. Students must see the problems for themselves and learn how to do something personally to remedy them. Christian education must instill in young people a profound respect for the world God has created and the skills to be faithful stewards of this God-given gift. ✍

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PROJECT IDEAS

Individual Student Projects

1. *Home energy audit:* Determine the amount of gas and/or electricity used on a daily basis in your home. Compile and graph the results for a one- or two-week period. Investigate ways to conserve.

2. *Carpool survey:* Conduct a survey near a busy street or highway to determine how many people are riding in each car. Record the results and design a poster to promote carpooling.

3. *Personal garbage inventory:* Keep track of all the things you throw away for a week. Categorize each item as recyclable or non-recyclable. See "Reducing the Garbage Glut: Audubon's Seven-Day Solid Waste Test," *Audubon Activist* 5(2):3 (October 1990). A copy may be obtained by writing to The Audubon Society, 950 Third Ave., New York, NY 10022.

4. *Water audit:* Measure (or estimate, if you don't have a water

meter) the amount of water used in your home each day. Graph the results for a one- or two-week period. Design a poster showing ways to conserve water.

5. *Environmental survey:* Design an environmental survey to be filled out by people in your neighborhood. Compile the results and report them to the class.

Group or Class Projects

1. *Garbage inventory:* Keep a record of everything that is thrown away in the classroom. Classify each item as to whether it is recyclable. Design a program to recover the major recyclable items.

2. *Puppet show:* Design a puppet show or skit about one or more environmental problems. Present the show or skit to another class, at a school assembly, or at a home-and-school night.

3. *Adopt-a-highway:* Choose part of a road near the school and pick up all the trash along it on a regular basis. Keep track of how much and what kinds of

trash you collect. Report the results to the local newspaper.

4. *Recycling project:* Start a neighborhood recycling project to help raise money for special class outings.

School Projects

1. *Earth Day:* Plan a special Earth Day program, complete with a tree planting, campus cleanup, posters, a letter-writing campaign, and debates. Invite the mayor, congressperson, or some other important person to participate.

2. *Adopt-a-highway:* Involve students, faculty, and parents in your state's adopt-a-highway plan.

3. *Compost food waste:* Build bins to compost all the food wastes from the school cafeteria and students' lunches.

4. *Carpooling:* Analyze how all the students get to school. Try to develop more efficient arrangements, such as carpooling.