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EARTH DESIGN 2000

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TABLE OF CONTENTS

Program Outline

Major Goals:

Earth Design 2000 encompasses the major themes of science project design and ecology. This standards-based program encourages students to use the scientific method to design and build an invention or perform an experiment that can be used to protect the earth's environment. Using problem-solving strategies, students identify a problem, research it, and design a solution. The research report contains data tables and graphs and a detailed explanation and diagram of the project. An important criterion is that students test their invention or experiment and prepare a poster and an oral presentation. The outstanding inventions/experiments are selected for display at the school's science fair.

In order to successfully implement this program, different activities are used to help students transition through the different stages of the inquiry process. The first stage involves an appreciation of environmental protection. Students survey living conditions on other planets and readily conclude that only earth has the conditions necessary for human existence. Students then brainstorm ways that man has polluted planet earth. These include the greenhouse effect, garbage dumps, pollution of air and water, and the holes in the ozone layer. They then suggest ways that people can alleviate these problems based upon how they are caused. The next step is to read about individuals who have taken up the cause of environmental preservation and protection. It is especially motivating for them to read about the successes of children who have made accomplishments in protecting the environment. TIME FOR KIDS: "Heroes for the Planet" highlights model environmental programs.

The next phase is to help students gain an understanding of the design process. We review the steps in the design process and work out an example. Experts from the Salvadori Center, an agency that teaches students how to learn mathematics and science using architecture as the theme, demonstrate how to design the developed environment while showing a sensitivity to the natural environment. It is important to protect forest preserves, lakes, and wildlife when planning for the infrastructure of communities.

The research phase comes next. Students use Internet Web sites and CD ROM encyclopedias to gather data and information on a wide range of environmental problems that provide a rationale for their inventions. They can do a search of pollution issues within their own communities and decide upon an appropriate invention to remedy the situation. Students can be taught how to use statistical information. They can gather statistics about the effects of different kinds of pollution on human health and on the environment, both

globally and locally. This relevant information helps students understand the severity of the problem and the need to mobilize their efforts towards finding solutions. Classroom computers with Internet access may be used to gather data. Students should also learn to design data tables using ClarisWorks for their own data collection when testing out their inventions and experiments. These are important technological skills for students to enhance their scientific investigations, which is an important component of middle school science.

The next stage is designing a project or an invention using the scientific method. Outlines are provided to serve as checklists and as an evaluation tool for the teacher. An important criterion in this project is the presentation of the project or invention. Students design posters following an outline and give an oral presentation of their projects to their classmates. This satisfies the performance standard for Scientific Investigation: Design (S8c), and for Scientific Communication (S7). Outstanding inventions and experiments are selected for presentation at the school's annual science fair. In addition, teachers may choose to put the project report into a student's portfolio, showing evidence of a long-term independently designed scientific investigation.

TIMELINE

This project is designed as a unit lasting about five weeks, which includes student presentations. The following is a week-by-week breakdown of the activities.

Week One: Developing an appreciation for protecting planet earth.
Activities: Students survey living conditions on other planets and readily conclude that only earth has the conditions necessary for human existence. They brainstorm ways that man has polluted planet earth. These include the greenhouse effect, garbage dumps, pollution of air and water, and the holes in the ozone layer. They then suggest ways that people can alleviate these problems based upon the causes. They read about individuals who have taken up the cause of environmental preservation and protection. TIME FOR KIDS: "Heroes for the Planet" is recommended reading. It highlights model environmental programs. To promote literacy in science, students choose a book about a famous scientist, past or present, who worked to protect the environment. They make a poster highlighting the scientist's major achievement, including a picture of the scientist or a picture relating to the theme of the accomplishment, i.e., forest preservation. Students present their scientist to the class. The posters make excellent classroom bulletin boards.

Week Two: Exploring the Design Process.
Activities: Students define the steps in the design process using specific examples. They also learn how man uses nature in a positive way rather than destroying the environment in order to move forward. Examples include building an igloo for housing in the North Pole, and using natural pesticides rather than harmful ones. Arrangements can be made with the Salvadori Center to have speakers visit the school to demonstrate how to design the built environment, while showing a sensitivity to the natural environment. It is important to protect forest preserves, lakes and wild life when planning for the infrastructure of communities.

The Research Phase: Students use CD ROM encyclopedias and Internet Web sites to gather data and information on a wide range of environmental problems, which provides a rationale for their inventions. They can do a search of pollution issues within their own communities and decide upon an appropriate invention to remedy the situation. They may also choose to focus their invention on creatively using things that are abundant in nature, such as ocean water, fallen leaves, ice, acorns, sand, air, and insects. They can develop new ways to use these resources to benefit mankind.

Weeks Three, Four, and Five: Experimental Design and Scientific Communication
Activities: Students design a project or an invention using the scientific method. They follow the outlines, which serve as checklists. The presentation of the projects may take longer than one week, depending upon the size of the class, but each student should have the opportunity to present his/her project to the class. The presentation includes a carefully designed poster, report, and working model of the invention. Students present a summary of their work to their classmates and answer relevant questions. In the case of an experiment, students present an overview of the entire experiment, highlighting the problem, hypothesis, their conclusions, and discussion of results. The work is expected to reflect evidence of a well-thought-out, independently designed scientific investigation. The outstanding projects and inventions are selected for presentation at the school's annual science fair. Teachers may choose to put the project report into a student's portfolio, showing evidence of a long-term scientific investigation.

Follow-up Activities: Each student is asked to select one environmental cause as a focus. This can include recycling; conservation of natural resources: protecting endangered animals: influencing public policy about pollution: and cleaning up the beaches, parks, and communities. The class can highlight students' causes in an Earth Design 2000 newsletter. The message is that every student can make a difference in environmental protection.

TYPES OF ASSESSMENTS USED

There are assessments for each lesson plan. There is also an assessment of the project or invention, research report, and the oral presentation. Please refer to the guidelines for assessment that are found in the last section of this packet.

LESSON PLANS

Aim: Why should we protect planet Earth?

Objectives:

1. To develop an appreciation for environmental protection and the role each individual plays.
2. To understand the causes of environmental pollution.
3. To brainstorm ways to combat or slow down environmental deterioration.

Time required:
Two 45-minute periods

Materials:
A two-liter soda bottle with the bottom cut off and miniature people, trees, and buildings for modeling a city (which are placed inside the soda bottle) and a flashlight (modeling the sun) to demonstrate the greenhouse effect.

Vocabulary:
Greenhouse Effect
Ozone Layer
Acid Rain
Recycling

Procedures:
1. Discuss the different planets and have students list the reasons why each one has conditions that are adverse to human life. Have students discuss the reasons why we must therefore protect planet Earth.

2. Students draw a bubble diagram showing the individual (you) in the center and the different roles they play with people with whom they interact. These may include child, grandchild, brother or sister, niece or nephew, cousin, friend, student, and community member. Students can visualize how they interact with many different people on many different levels. They can discuss ways to act as role models for environmental protection with all the people with whom they have a relationship.

3. Discuss the major causes of the greenhouse effect and global warming trends, holes in the ozone layer, acid rain, and garbage. Demonstrate the greenhouse effect using the soda bottle mini-city and the flashlight.

4. Brainstorm ways to limit the causes of pollution that destroy the environment. List on the board the following columns: Problem; Cause; Possible Solution. Have students work in groups to complete the chart. Discuss the results with the class.

Extensions or Follow-up Activities:
1. Write a plan for an invention or an experiment to limit the causes of environmental damage. You may wish to research the causes of pollution in your community or your school's community, and try to solve the local pollution problem with an invention.

Homework:
Select one environmental cause that you will adopt. Write why you chose this cause and how you intend to accomplish your mission. Possible choices are: recycling; conservation of resources; and influencing public policy about pollution, animal protection, and cleaning up beaches, parks and the community.

Evaluation
Students present their essays about environmental causes. The class can publish an Earth Design 2000 newsletter highlighting environmental concerns and student designed solutions. This is a way to encourage good citizenship.

Lesson Plan

Aim: What are the steps in the design process?

Objectives:
1. To learn the steps in the design process.
2. 2. To solve a problem using the steps in the design process.

Time Required: Three or four-45 minute periods. Additional time is required for student presentations.

Advanced Preparation:
The teacher makes a chart of the steps in the design process.

Materials Required:
Glue, tape, index cards, metric ruler, paper clips, scissors

Vocabulary:
Alternatives, criteria, design brief, implement, evaluate

Procedures:
1. Present students with this challenge: what if you were asked to design a bridge for the 21ST Century that could move people across a large body of water in many different ways. What steps would you take to accomplish your goal? Students discuss the steps they would take. The teacher summarizes the steps in the design process:

Step 1: Define the Problem Clearly
Step 2: Describe the Results You Want in a Design Brief
Step 3: Gather Information
Step 4: Think of Alternative Solutions
Step 5: Choose the Best Solution
Step 6: Implement the Solution
Step 7: Evaluate the Solution and Make the Necessary Changes

The teacher discusses each step and uses the example of designing a bridge to explain each step as follows:

Step 1: Define the Problem Clearly
I need to design a multipurpose bridge to move people efficiently across a large body of water.

Step 2: Describe the Results You Want in a Design Brief
This is a simple statement that explains the possible solution to the problem. In this case, design and construct a model bridge to stand on the floor. It must have at least six (6) different ways to move people across a body of water. Although the bridge may be made from any material, it must be able to stand on its own.

Step 3: Gather Information
Information on different types of bridges can be found in the library or in an encyclopedia or on the Internet.

Step 4: Think of Alternative Solutions

Ideas for solving problems are called alternatives. Some alternatives for moving people across a bridge include: trains, buses, cars, walking, bicycles, monorail, cable cars, heliport, moveable walkway, and underwater cable car.

Step 5: Choose the Best Solution

Select the best solution from the list of alternatives. Eliminate those alternatives that do not meet the design criteria-- the specifications the designer must follow.

Step 6: Implement the Solution

This means building the model bridge.

Step 7: Evaluate the Solution and Make Necessary Changes

Once the model is built, test it to see if it satisfies the criteria in the design brief. Make any changes that are necessary. After reviewing these steps, students may use the materials listed to complete their bridge design.

The steps in the Design Brief are adapted from: Hacker, M. and Barden, R. Technology in Your World Second Edition. New York: Delmar Publishers Inc. 1992.

Extensions or Follow-up Activities.

1 .Write a design brief for a new type of transportation.

A. What type of features would you include?
B. What materials would you use?
C. How big would it be and how many people would it hold?
D. Draw the design and describe it.

2. Arrange to have professionals from the Salvadori Center come to discuss the importance of environmental protection and preservation and infrastructure design when planning for a community.

3. Introduce the outlines for an invention and an experiment. Ask students to choose only one type of outline to follow. The project will be evaluated on the invention or experiment, poster, research report, and an oral presentation to the class.

4.Worksheets on robot design may be used to demonstrate inventions.

Homework:

1. Explain how the design process is useful in helping us solve problems.
2. Research igloos. Explain how it is possible for an igloo that is made out of ice to keep an Eskimo warm. Tell why this is a good solution for temporary housing in the arctic region.
3. Select an invention or an experiment and follow the outline. Produce an invention or an experiment, poster, research report and an oral presentation

to the class. This is due two weeks from the assigned date. Research may be done in the school library.

Evaluation:
Test students on the seven steps of the design process. Define the vocabulary words used in the design process.

Lesson Plan

Aim: Report on a Famous Scientist

Objectives:
1. Write a book report about a famous scientist.
2. Design a poster about the scientist to display in the classroom.
3. Model how scientists protect the environment in different, innovative ways.

Time Required:
Two 45-minute periods

Materials Required:
A book about a scientist, past or present, who protected the environment; construction paper; glue

Vocabulary:
Conservationist, ecologist, environmentalist

Procedure:
Assign a book report due within two weeks. The topic is a scientist who is an environmental hero. Some suggestions can be found in TIME, "How to Save the Earth." Vol. 155, No. 17, April-May 2000. Students will prepare a book report and a poster using the following outline:

Topic:
A famous scientist (past or present), who worked to improve the environment.

Organization:
Produce a book report that is neatly written or typed, double spaced, and is checked for spelling and grammar.

Content:
1. Introduction Tell why you chose to write about this scientist.
2. Tell where the scientistand was born and where he lived/lives.
3. Write at least ten (10) interesting facts about the scientist's life. You can include facts about family life and education.
4. Describe the scientist's most important contribution or invention.

5. Explain why this scientist's contribution or invention is so important to environmental protection.
6. Bibliography

Design a poster showing:

1. A picture of the scientist, or an illustration showing his/her contribution.
2. Biographical information: Date of birth, death or still living, country of birth
3. State the scientist's most important contribution to environmental protection.

Extensions or Follow-up Activities:

1. Students can present their posters to the class.
2. The poster can be designed on the computer and presented as a slide show using a program such as HyperStudio.
3. Guest speakers can be invited to address the class on environmental issues and the job that they do.

Homework:
Choose a book for the book report and write or type the report. Follow the outline carefully. Design the poster and color it.

OPTIONAL LESSON

Lesson Plan for "Soda Bottle City" in the year 2,000

Funded by a grant from IMPACT II, 1993.

Motivation: We have researched and studied about different power sources. You have selected at least one energy source or a combination of power sources for your mini-city. You have planned out your city on graph paper. We are now ready to construct it.

Materials:

1. A pre-cut 2- or 3-liter soda bottle: At home, students have their parents cut off the bottom of the soda bottle 2 inches from the bottom. Students bring both top and bottom parts to class.
2. Pre-cut cardboard circles for the floors: Students skilled with using a compass may want to measure and cut their own floors.
3. Recyclable materials that students bring to class: Includes styrofoam egg cartons, soda bottle caps, and string.
4. Aluminum foil for solar reflectors, glue, construction paper, "Model Magic" modeling compound by Crayola, index cards, erasable markers, colored pencils, scissors, tape, and popsticks. Optional: artificial trees and shrubbery; wires, batteries and switches for students capable of adding lighting.

Procedure:

1. Students work alone or with another person. If two are working together, each child must construct at least one floor alone.
2. Students work from their plans done on graph paper to build each floor.
3. If an elevator for transportation is desired, cut a hole in the center of each floor big enough to allow a bottle cap to pass through it. Tie a bottle cap to some string for the elevator.
4. Insert floors one at a time gluing each one in.
5. Seal the bottom of the soda bottle to the top with glue.
6. Prepare an index card with name, class and a brief description of each level.

Summary:

You have built a self-contained model of a mini-city in the year 2000. You have built it to your own specifications based upon your knowledge of power sources, pollution and protecting the environment.

Aim: Building a soda bottle mini-city for the year 2000.

OUTLINE FOR AN INVENTION RESEARCH REPORT
DEVELOPED BY: Manette B. Gampel

Use this outline as a guideline for writing the research report on your invention.

1. What is the problem?
Research a problem such as pollution in your local community. Describe the problem and present statistics about the extent of the problem.

2. Purpose of the Invention.
Tell why the invention is needed. Explain how your invention will address the problem. Give a brief description of how it works. Who will benefit from this invention?

3. Procedure:
How did you build it? List the steps.

4. Diagram:
Label all of the parts.

5. Materials:
What did you use to make the invention? Where did you get some of the interesting materials?

6. How would you improve the invention next time?
What if you had a lot of money to work with to improve it?

7. Safety Precautions

8. Data
If your invention works, test it and record what happens.
If your invention does not work, make predictions about how it would work.

9. References
List any books, encyclopedias, magazines, Internet sources, and experts that you talked to about the invention.

OUTLINE FOR AN ENVIRONMENTAL EXPERIMENT REPORT

OBJECTIVE: Choose an experiment that results in improving Earth's environment.

Cover Page: Include the project title and heading (name, school, date, and class).

Report Checklist: List the sections of an experimental report and the pages. Place a check next to each section that you covered in this report.

Background: Use books, encyclopedias, the Internet, etc. Summarize the information that you read about this topic.

EXPERIMENTAL DESIGN:
Abstract: Summary, which includes the problem, hypothesis, and conclusion.

Hypothesis: This is a possible answer to the question or problem. It is written using **If**.... and **then**. Example: **If** I soak an uncooked egg in vinegar, **then** the shell will dissolve.

Materials: This is a list of the materials that you used to conduct the experiment. Be specific in the amounts that you used.

Procedure: List and number the steps that you took in doing the experiment.

Observations: Write down what you observed while doing the experiment. Choose a time interval to make the observations. Example: Once a day at 5PM. Make charts of your observations and be sure the charts have a title and are properly labeled. Make a data table based upon the charts. Use metric measurements. Be sure to use a control in the experiment. Example: The control could be the plant that

gets plain water, while the other two plants each get different kinds of water. Pictures may also be included here and should come with a brief explanation.

Conclusion: Tell whether your hypothesis is correct or incorrect. Example: My hypothesis is correct: the egg's shell did disintegrate in the vinegar.

Discussion: In this section, tell why you think the results happened. You can decide what further research needs to be done based upon your findings. Explain the impact of your project on the environment.

Bibliography: List the books, encyclopedias and Internet references, etc. that were used for your project.

RESOURCES

Agency

SALVADORI CENTER
c/o City College Y Building
308 A 135th St. & Convent Ave.
New York, NY 10031-9198
Phone: 212-650-5497
thecenter@salvadori.org
Provides education and resources on the built environment.

Articles

Epstein, Paul R. "is Global Warming Harmful to Health?" Scientific American, 283(2), (August 2000), 50-57.

Gampel, Manette B. "Soda Bottle City in the Year 2000." Funded by a grant from IMPACT II, 1993.

Gampel, Manette B. "Subterranean City." Science Scope, 16(6), (March 1993), 64-69.

Gilchrist, Michael R. "Making Environmentally Friendly Cleaners," Science Scope, (Nov/Dec. 1999), 26-28.

Books

Baker, Wendy and Andrew Haslam. Make it Work! Machines. New York: Thomson Learning, 1993.

Hacker, Michael and Robert Barden. Technology in Your World second ed. New York: Delmar Publishers Inc. 1992.

Haslam, Andrew. Make it Work! Building. New York: Thomson Learning, 1994.

New Standards Performance Standards for Science. New York City: Board of Education of the City of New York, 1999.

Field Trips
Local Recycling Center
Energy Conservation Center
Water Treatment Plant
Museum of Design

Magazines

TIME FOR KIDS. "Heroes for the Planet." in TIME, Special Edition, Earth Day 2000, "How to Save the Earth," 155(17), (April-May 2000), 89-96.

TIME, Special Edition, Earth Day 2000, "How to Save the Earth," 155(17), (April-May 2000).

Poster

"Heroes of the Environment." Scholastic Inc. Supplement to Scholastic News, 1993.

Scientific Tool
Carolina's "Eco-Seeker," Carolina Biological Supply Company, 2700 York Road, Burlington, NC 27215. Phone., 800-334-5551. This tool is used to study environmental science.

Speakers

Conservationists, politicians, and workers in sanitation; Contact people in the local community for volunteer speakers.

Teaching Guides

Teacher Catalog KIDS DISCOVER 149 Fifth Avenue, New York, NY 10010 Phone: 212-677-4457. Recommended booklets for this unit: Inventions, Robots, Garbage, Energy, Oceans, Rain Forests.

"Natural Born Robots." Scientific American Frontiers Teaching Guide for Show 1002,
November 2, 1999, 8-9 P.M.
www.pbs.org/saf/born robots. html I
(click on "Teaching Guide")

"The Frontiers Decade." Scientific American Frontiers Teaching Guide for Show 1005,
April 25, 2000, 8-9 P.M.
www.pbs.org/safarchive/

Videos

Children's Television Workshop, "The Rotten Truth." 3-2-1 Contact Extra, 1990.

"The Earth Day Special"
Time Warner

Web Sites

Alternative Energy Classroom Ideas http://www.picoturbine.com/projectlist.htm

Envirolink www.envirolink.org

The Environmental Defense Scorecard www.scorecard.org
Learn about the quality of your community's environment.

National Wildlife Federation www.nwf.org

The National Inventors Hall of Fame www.invent.org/book/book-text/2.htmi

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Gampel, Manette B. "Soda Bottle City in the Year 2000." Funded by a grant from IMPACT 11, 1993.

Hacker, Michael and Robert Barden. Technology in Your World second ed. New York: Delmar Publishers Inc. 1992.

Scientific American Frontiers. "Natural Born Robots." Teaching Guide for Show 1002, November 2, 1999, 8-9 P.M. www. pbs.org/saf/born robots.htm I (click on "Teaching Guide")

Scientific American Frontiers. "The Frontiers Decade." Teaching Guide for Show 1005, April 25, 2000, 8-9 P.M. www. pbs.org/saf archive/.

The Environmental Defense Scorecard www.scorecard.org

TIME FOR KIDS. "Heroes for the Planet." in TIME, Special Edition, Earth Day 2000, "How to Save the Earth," 155(17), (April-May 2000), 89-96.

TIME, Special Edition, Earth Day 2000, "How to Save the Earth," 155(17), (April-May 2000).

SAMPLE STUDENT WORK

Chun Li T.
Dyker Heights Intermediate School 201 Class: 6SM

Pollution Solution

The Pollution-Solution will help to end air pollution. This world is too polluted, and it is causing problems for the planet and for us. It appears to cause cancer and other diseases, and some people are dying from it. Air pollution also contributes to acid rain, the greenhouse effect and much more. If we continue polluting our air, it will eventually become too hazardous for us to breathe. That's why I want to help the environment and people by making this invention.

I like the environment. It is very beautiful, and I would like it to stay that way. With my invention, it will mean less pollution for us in the future. There would be less polluted air, acid rain and the green house effect for the human race. This world needs some cleaning up, and the perfect place to start is with the air.

I came up with the idea when I was thinking, what causes air pollution the most? The greatest causes of air pollution are industrial factories and cars. There are many factories and also millions of cars that cause air pollution. I was thinking about a way to change polluted air into fresh air. Since there already is a way to change polluted water into fresh water, there needs to be a way to change polluted air into fresh air.

The Pollution -Solution works like a filter. All of the filthy particles from the burned gases, which come out of the exhaust pipe of a car, or from factory smokestacks, will get trapped in a round shaped, dry filter. The burned gases will go through a set of filters small enough to fit into an exhaust pipe of a car, and big enough to fit the smokestacks of factories. The filthy particles will get trapped in the fibers, which would be very small, so that the filthy particles would not pass, but the clean air will pass through. At times, the filters would be full of filthy particles, and need to be replaced, or need to be cleaned in order to be used again.

SAMPLE STUDENT WORK

Alyssa L. Date: May, 2000
Dyker Heights Intermediate School 201 Class- 6SPE

Choose one thing that you will try to do for the environment. Why did you choose it? How will you accomplish your goal?

There are so many different things that I can do to help my environment. But if I choose only one thing, it would be to help clean up the shore area near the department stores. I have gone there many times, and it is filthy. People just throw all their garbage on the ground and in the water. People go fishing in this area, and the water is filled with garbage and filth. Not only can the fish get sick, but also the people who eat the fish can also get sick.

The first thing I would do to accomplish this goal is to put trashcans in this area. Next, I would try to encourage other people who want to clean up this area like I do. Then we would all be able to work together.

I believe that polluting the earth is horrible. Whoever lives on this earth should do something about pollution!

SAMPLE STUDENT WORK

Boris N. Date, January, 2000
Dyker Heights Intermediate School 201 Class- 6SM

RECYCLE-BOT

My invention is called Recycle-Bot. Its purpose is to separate different types of metal from recyclable glass. It could also be used to separate metal from plastic, instead of having people do it by hand. Every recycling plant could use one.

The Recycle-Bot works on battery and motor power. The crane part of the Recycle- uses two nine-volt batteries attached to a reverse polarity switch. The power passes through the switch into the motor. There is a string tied to the motor and the end of the arm. When the motor turns, the string winds around the motor, which moves the arm up and down. The electromagnet, another part of my robot, is made by wrapping a wire around a screw. The wire is connected to a switch, and

the other wire is connected to the battery. When the switch is turned on, the power goes through the wires and around the screw, which magnetizes the screw.

In order to build the robot, I first got all of my materials. I purchased my six-volt battery, nine-volt batteries, wires, motor and reverse polarity switch. Then I purchased my base and arms at a crafts store. Next, I made my magnet and arm, and I tested it to see if the magnet worked. After that, I tested it to see if the arm worked. Then, I put on the arms. I had some trouble deciding where to put the motor and string. I put a hole on the top of the base where the string passes through, and I put the motor at the bottom and tied the string to the motor. Next, I tried to move it up and down with the motor using the reverse polarity switch, which was attached to the battery. It worked, but the only problem was that the arms were not the same height. They were crooked, so I cut into the wood where the arms rested and made one of them a little bit lower. After that, I mounted the magnet to the arm. I then hooked up the wires to the battery and the switch. After I made sure that everything was working properly, I fastened everything down with tie-wraps.

Another problem that I had was that the weight of the arms were too heavy, causing the arm to drop down too fast and go up too slowly. To correct this, I put a counter weight on the back of the string to distribute the weight evenly.

I would improve my robot by making the base swivel around with a motor.

(:?- 7)

SAMPLE STUDENT WORK

Kerry L. January 2000
Dyker Heights Intermediate School 201 Class, 6SM

ECO-CAMP

My science fair project is called Eco-camp. It is an idea I thought of that can help the environment. People who attend this camp can recycle trash by making the garbage into something useful like toys and souvenirs. They can also decompose leftover food in the soil.

Because of all the pollution and garbage nowadays, there are more germs and diseases going around. Did you know that 26 million pounds of garbage in the city gets stacked up and has no where to go? Imagine living near a smelly place like that! Eco-camp can change that by encouraging kids to come together and make a difference, and it's fun too. A lot of people would enjoy painting and doing artwork on cans and bottles. For example, kids can take glass bottles and paint pictures on them. They can use them as a vase after the paint dries.

I like the idea of Eco-camp, because instead of machines recycling the cans and bottles, kids can do it and find new ways to reuse them. My model shows different ways that kids can reuse garbage. Even the camp's playground is made out of recycled tires and metal, as well as other things that were thrown away. Eco-camp is a place where kids can come together to help our planet.

SAMPLE STUDENT WORK

Victoriya N. Date, May, 2000
Dyker Heights Intermediate School 201 Class: 6SPE

Choose one thing that you will try to do for the environment. Why did you choose it? How will you accomplish your goal?

I will try to cut down on using aerosol sprays so that the ozone layer, which protects the earth from the harmful rays of the sun, won't break down. I chose to do this because I know how painful a sunburn can be. Now just imagine how painful it would be if we would get sunburned many times worse than we do now on a hot, sunny day. This can happen because of the holes in the ozone layer, which let in the sun's harmful rays.

I am going to try to cut down on insecticide sprays and the hairsprays and the aerosol room deodorizers. I would try using gel instead of hair spray, and powder instead of insecticide sprays, and pine cones instead of aerosol room deodorizers. In this way, I can help stop polluting the planet.

SAMPLE STUDENT WORK

Maura 0. Date: January 2000
Dyker Heights Intermediate School Class.- 6SM

CAN YOU BELIEVE THIS?

The title of my invention is "Can You Believe This?" My idea is to use leaves as a new waterproofing material. It is also a good building material that insulates well. My invention is used for waterproofing things such as siding on houses. The materials I

use are water, glycerin and leaves. You need the glycerin to make the leaves stronger and more waterproof. My invention can withstand many different weather conditions such as wind and rain.

I have proven that my invention can work. I built a mini model of it, and tested it with water and wind. The results were good. It was water resistant, and the wind did not change the condition of the leaves.

My invention is good for the environment because it uses the leaves that are found on the ground during Autumn. The invention is also useful for people who are becoming ill from leaves that rot in a nearby dump. My invention would help solve that problem, because instead of throwing out the leaves, they could be sent to a factory, where my design would be manufactured. My design helps to improve engineering. It is useful for engineers who design building materials. My invention produces a building material that is strong and insulates well.