The Development and Implementation of an Action Skills Unit and Its Impact on the Environmental Attitudes of Edgar Fifth Grade Students

By

Jon Albee

A research paper submitted as partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

in

NATURAL RESOURCES – ENVIRONMENTAL EDUCATION

College of Natural Resources

University of Wisconsin – Stevens Point

Stevens Point, Wisconsin

August 2003
APPROVED BY:

Dennis H. Yockers, Ph.D.

Associate Professor of Environmental Education
ABSTRACT

The purpose of this project was to determine if the involvement of Edgar fifth grade students in a citizen action skills and participation unit would impact their environmental attitudes. The process started by identifying potential community projects for students to be involved in. The idea of adding storm drain stenciling and building wood duck nesting boxes to an already existing water unit proved to be the best alternative. A curriculum was developed for teaching a comprehensive water unit that would include student involvement in citizen action skills instruction emphasizing persuasion and ecomanagement. A pre-survey was then identified to measure student attitudes toward the environment prior to involvement in the water unit. After administering the pre-survey and analyzing the results, the water unit was implemented. After completing the unit and community projects, students were given a post-survey to determine the results of implementing the citizen action skills and participation unit plan. It was found that student’s environmental attitudes were impacted in some areas, and not in others. The areas that showed impact were those directly related to the unit plan that was taught.
I would like to thank my wife, Deb, for the continual support she gave me throughout this long process. Her encouragement helped me to achieve my goal of completing this project and masters program. Thank you for being such a positive influence in my life.

I would also like to thank Dr. Dennis Yockers, my graduate advisor, who gave me the knowledge and confidence to become more of a leader in environmental education. His enthusiasm for teaching about the environment is second to none, and I hope only to come close to achieving what he has with his students.

Finally, I would like to thank Bob Christianson for all of the help and support he gave to this project. His passion about the outdoors made it possible for these student projects to happen.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iv</td>
</tr>
<tr>
<td>CHAPTER I: INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Importance of the Study</td>
<td>2</td>
</tr>
<tr>
<td>Subproblems</td>
<td>2</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>3</td>
</tr>
<tr>
<td>Limitations</td>
<td>3</td>
</tr>
<tr>
<td>Definitions of Terms</td>
<td>4</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>4</td>
</tr>
<tr>
<td>Assumptions</td>
<td>4</td>
</tr>
<tr>
<td>CHAPTER II: REVIEW OF RELATED LITERATURE</td>
<td>6</td>
</tr>
<tr>
<td>Overview of Citizen Action Skill and Service Learning</td>
<td>6</td>
</tr>
<tr>
<td>Importance of Citizen Action Skills and Participation in Elementary EE Curriculum</td>
<td>9</td>
</tr>
<tr>
<td>Existing Curriculum for Teaching Citizen Action Skills and Participation in Wisconsin</td>
<td>10</td>
</tr>
<tr>
<td>Overview of State Standards Related to Citizen Action Skills and Participation in Wisconsin</td>
<td>11</td>
</tr>
<tr>
<td>Overview of NAAEE “Excellence in Environmental Education – Guidelines for Learning (K-12)”</td>
<td>13</td>
</tr>
<tr>
<td>Current Status of EE and Action Skills Instruction in the Edgar School District Fifth Grade Curriculum</td>
<td>14</td>
</tr>
<tr>
<td>Summary</td>
<td>14</td>
</tr>
<tr>
<td>CHAPTER III: METHODOLOGY</td>
<td>16</td>
</tr>
<tr>
<td>Estimated Project Timeline</td>
<td>16</td>
</tr>
<tr>
<td>Subproblem One</td>
<td>17</td>
</tr>
<tr>
<td>Subproblem Two</td>
<td>17</td>
</tr>
<tr>
<td>Subproblem Three</td>
<td>18</td>
</tr>
<tr>
<td>Subproblem Four</td>
<td>18</td>
</tr>
<tr>
<td>Subproblem Five</td>
<td>18</td>
</tr>
<tr>
<td>Subproblem Six</td>
<td>19</td>
</tr>
<tr>
<td>Subproblem Seven</td>
<td>19</td>
</tr>
<tr>
<td>Subproblem Eight</td>
<td>20</td>
</tr>
<tr>
<td>Subproblem Nine</td>
<td>20</td>
</tr>
<tr>
<td>CHAPTER IV: RESULTS</td>
<td>21</td>
</tr>
<tr>
<td>Actual Project Timeline</td>
<td>21</td>
</tr>
<tr>
<td>Subproblem One</td>
<td>21</td>
</tr>
<tr>
<td>Subproblem Two</td>
<td>23</td>
</tr>
<tr>
<td>Subproblem Three</td>
<td>24</td>
</tr>
<tr>
<td>Subproblem Four</td>
<td>25</td>
</tr>
<tr>
<td>Subproblem Five</td>
<td>25</td>
</tr>
<tr>
<td>Subproblem Six</td>
<td>28</td>
</tr>
<tr>
<td>Subproblem Seven</td>
<td>31</td>
</tr>
</tbody>
</table>
Chapter 1
INTRODUCTION

Most people would agree that a major goal of education is to prepare students for a successful future. While mastering core subject areas such as math and reading are extremely important for students to have a quality life, another significant component for a quality life is environmental education. It is my belief that a quality environment is important for a quality life, therefore students need skills that will allow them to successfully solve problems pertaining to the environment. Environmental education not only provides students with awareness and knowledge about the environment, but also the skills and confidence needed to solve environmental problems. By giving students an opportunity to participate in citizen action skills and participation projects we are giving them another necessary component in achieving a quality life.

Problem Statement and Setting

Statement of the Problem

To what extent will the development and implementation of an action skills unit plan, including community environmental projects, impact the attitudes of Edgar Elementary fifth grade students towards the environment.

The Importance of the Study

A major goal of environmental education is to promote environmental literacy that will hopefully lead to environmentally responsible behavior (Wisconsin’s Model Academic Standards, 1998). Teenagers’ attitudes towards objects and ideas tend to influence their behavior related to those objects and ideas. This has been true for
centuries in adolescent clothing trends. “The values, attitudes, and opinions of teens
directly influence their purchasing behaviour” (Trendscan, 2003). For example,
everyday as a teacher I see this when children come to my classroom wearing certain
clothes because they have the attitude that they have to “fit in” with the other kids. Since
this is true we may be able to apply it to the area of environmental education.

In order to reach the goals of environmental literacy and environmentally
responsible behavior, we as educators should facilitate the development of positive
environmental attitudes. Therefore, it is important to find out if fifth grade students’
attitudes towards the environment are positively influenced by being actively involved in
environmental projects. If this is found to be true, we will have gained credible
information that supports the infusion of environmental action skills into the fifth grade
curriculum at Edgar Elementary School.

**The Sub problem**

1. **The first subproblem** is to identify environmental projects in the Edgar
   community.
2. **The second subproblem** is to identify environmental action skills that will be
   applicable to those projects.
3. **The third subproblem** is to develop the 5th grade lesson plans for the action skills
   unit.
4. **The fourth subproblem** is to identify an assessment instrument to measure the
   attitudes of Edgar Elementary School fifth grade students towards the
   environment.
5. The fifth subproblem is to administer the assessment instrument to the experimental group and analyze the results to determine the environmental attitudes of Edgar Elementary fifth graders prior to the action skills unit.

6. The sixth subproblem is to implement the action skills unit plan through core subject areas.

7. The seventh subproblem is to involve the students in community environmental projects in which student action skills can be applied.

8. The eighth subproblem is to readminister the assessment instrument to experimental group of Edgar Elementary fifth grade students.

9. The ninth subproblem is to analyze and interpret the data to assess the attitudes of Edgar Elementary fifth graders towards the environment.

**The Hypothesis**

1. There will be an impact in the environmental attitudes of EES fifth graders as measured prior to implementation and application of action skills compared to after formal instruction in a citizen action skills unit.

**The Limitations**

1. The study will not identify nor evaluate prior environmental education experiences of Edgar Elementary fifth grade students.

2. The study will be limited to projects located within walking distance of the Edgar Elementary School.

3. The study will be limited to Edgar Elementary fifth grade students.
**The Definitions of Terms**

**Action Skills** are any skills that enable the students to become involved in some type of citizen action related to environmental project.

**Community environmental projects** consist of projects related to environmental issues in the Village of Edgar such as storm drain stenciling and building wood duck nesting boxes for a local wetland area.

**Core Subject Areas** are the areas of language arts, math, science, and social studies.

**Fifth Grade Students** refers to students in fifth grade at Edgar Elementary School in Edgar, Wisconsin.

**Abbreviations**

**EES:** Edgar Elementary School

**EE:** Environmental Education

**CASP:** Citizen Action Skills and Participation

**Assumptions**

1. There will be school administrative and community support for citizen action skills education and its application involving EES fifth graders.

2. Community organizations will help identify and agree to participate in community environmental projects with the Edgar Elementary fifth graders.

3. The teacher has background knowledge in environmental action skills.
4. Citizen actions skills will be able to be infused into the current core curriculum.

5. The implementation and application parts of this project will be completed in the time frame of a school year.
Overview of Citizen Action Skills and Service Learning

It must be in human nature to try to improve upon previously formed ideas or methods. We have seen this throughout our lives with airplanes and automobiles, and now it is apparent today, in what we call environmental education. There have been several movements to educate people about the environment from Nature Study in the 1890’s to Conservation Education in the 1920’s. Following those environmental movements came Outdoor Education going from the 1930’s to about 1960. And finally, we reach today’s movement called, Environmental Education. Defined by the Wisconsin Environmental Education Board, Environmental Education is,

“A lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, ethical awareness and sensitivity for the relationship between humans and the environment, and commitment to engage in responsible individual and cooperative actions. By these actions, environmentally literate citizens will help ensure an ecologically sustainable environment” (Wisconsin’s Model Academic Standards, 1998).

Some people feel that the increase in public awareness of environmental problems pressured leaders in outdoor education and conservation education to intertwine some of their views and philosophies to create environmental education. This was a great realization that educators could not focus only on natural resource management, but it
was time to include life in suburban areas and the cities (Hungerford et al, 1998). This understanding that the quality of our earth was much larger than managing our natural resources led to the primary goals of EE. The first goal is the development of environmentally literate citizens. This means that individuals will be aware of and knowledgeable about the environment and environmental problems and issues, as well as, have the ability and desire to act on them. The second goal of EE is to promote responsible environmental behavior. Assuming that EE reaches the above goal, the environmentally literate citizen will have the ability and desire to live a sustainable lifestyle.

Responsible environmental behavior really has two sides to it, one being a preventative life-style promoting sustainable living. In other words, behaving in a way that will not create environmental problems. Unfortunately, there are plenty of environmental issues and problems out there today that cannot be prevented but can be solved. This leads to the other side of responsible environmental behavior that is being knowledgeable about environmental problems and involved in their solutions.

Citizen Action Skills “are those skills that individuals can use to help solve environmental issues. Knowing what these skills are and how to practice them is an important contributor to responsible environmental behavior” (Volk, 1998). Specific action skills include ecomanagement, persuasion, consumer action, political action, and legal action. If our goal is to have students successfully solve problems, we must provide a number of tools for them to use in order to increase their chances for success. “Because issues change over time, and because appropriate solutions change, it is critical that students learn how to make good decisions about solving environmental issues” (Volk,
Giving students an opportunity to implement these skills is also extremely important. "Just like the skills needed to investigate and evaluate issues, citizen action skills are better learned and retained when opportunities are provided for practice and application" (Volk, 1998).

Similar to citizen action skills and participation (CASP), another educational philosophy called "service-learning" is gaining popularity. "Service-learning combines service to the community with student learning in a way that improves both the student and the community" (Corporation for National and Community Service, 2003). Service-learning programs have the potential to produce many outcomes that will positively affect the student and community. For example, "...effective service-learning programs can improve academic grades, increase attendance in schools, and develop personal and social responsibility" (WI DPI, 2002). Academically, students can gain many skills from being involved in service-learning programs. Many language arts skills such as writing, reading, speaking, and listening are used during the projects. Analytical and problem solving skills are also put to use during service-learning projects.

Although service-learning is not directly linked to EE, there are great similarities between it and citizen action skills and participation. Both support the improvement of academic skills by involving students in hands on projects. Some of the less noticeable similarities are that both techniques allow students a greater appreciation of civic responsibilities and they also provide lessons in leadership that will enable students to become more self-confident in real life situations. With that in mind it is essential that we realize that one-time participation is not likely to have much of an impact on students. In fact "...service-learning can provide the most benefit to students if it is a regular part
of their education, over time" (WI DPI, 2002). Likewise in EE, it was recognized in the states of Wisconsin and California there was a need for EE learning beginning in primary years and continuing throughout the students; high school education.

The Importance of Citizen Action Skills and Participation in the Elementary EE Curriculum

The term democracy, meaning "government by the people..." (1989), should in itself warrant the importance of providing instruction in CASP in the K-12 EE Curriculum. We live in a society where the quality of our life depends on the quality of our environment. As humans, the quality of our environment is based on the decisions we make that affect it. It is essential that our future generations have the skills necessary to make an impact on environmental decisions and the courage to act on them. This is the only way we can help in the process of creating a sustainable earth.

In every community, dozens of decisions are made daily which affect the lives of local citizens and often the lives of people around the globe (Dale, 1978). Without proper education in CASP, many individuals may believe that they have no control over what goes on in our government or environment at the local, state, or federal levels. If this is the feeling of our children, it is our responsibility to change their attitude and enable them to make a difference.

A 1994 survey entitled "Are We Walking the Talk?" conducted by the Wisconsin Center for Environmental Education (WCEE), shows reason for environmental education, including citizen action skills and participation, in elementary schools. In fact 33% of Wisconsin 5th grade students surveyed, enjoy studying environmental topics more
than other subjects (Wisconsin Center for Environmental Education, 1997). Although,
compared to high school students, only 4% more students enjoy studying environmental
topics more than other subjects, it does show that environmental education in the
elementary school is worthwhile. The study also shows that students in the fifth grade
taking the survey “...did not feel it was a waste of time to work on environmental
problems” (WCEE, 1997). With this attitude students should be given the opportunity to
learn citizen action skills and participate in solving environmental issues that are
appropriate for their level.

According to the fifth graders surveyed, students perceived themselves as being
involved in environmental action taking at a moderate level (WCEE, 1997). This survey
shows an interest in environmental subjects, issues, and involvement by Wisconsin fifth
graders. With this information educators should be motivated to include a complete
environmental education curriculum, including citizen action skills and participation, in
their regular curriculum plan.

Existing Curriculum for Teaching Citizen Action Skills and Participation

It is evident at this point that curriculum consisting of CASP should be
implemented into our schools. According to the Wisconsin Department of Public
Instruction, citizen action skills and participation should be a minor emphasis at the K-6
grade levels and a major emphasis at the 6-12 grade levels (Engleson and Yockers, 1994).
Therefore, it is important that educators begin adapting their instruction to include citizen
action skills and participation. In order to implement CASP, students must have a
foundation in the earlier subgoals of EE, such as awareness, knowledge, and
environmental ethics. This is the emphasis in the lower and upper elementary levels. It is with this foundation, we are now able to begin citizen action skills and participation instruction.

Currently there are several resources to aide in infusing and integrating CASP into existing curriculum. Since the level of implementation may vary by teacher or school district, there are several options to choose from when looking for a guide to assist in this process. One such curriculum guide called *A Guide to Curriculum Planning in Environmental Education* (Engleson and Yockers, 1994), details the basis of EE and how to implement it into current core subject areas. The guide, *A Prototype Environmental Education Curriculum for the Middle School* gives a three-year course of study for the middle school student (Hungerford, Volk, Ramsey, 1989). Other possibilities for integration are the use of thematic units dealing with environmental topics, or infusing CASP into one specific subject area.

**Overview of State Standards Related to Citizen Action Skills and Citizen Participation in Wisconsin**

As was previously mentioned, environmental education has five subgoals, awareness, knowledge, attitudes, citizen action skills, and citizen participation. The Wisconsin Environmental Education Board (WEEB) has taken an aggressive approach in getting the EE standards in place. In 1983 elected officials of the state were convinced that Wisconsin school districts must “...develop and implement a written, sequential curriculum plan incorporating instruction in environmental education into all subject area curriculum plans, with the greatest emphasis in plans for art, health, science, and social studies education” (Wisconsin Dept. of Public Instruction, 1998).
Since that time, the Wisconsin DPI has developed well-defined EE standards for public schools. The Wisconsin EE standards are broken down into five content standards, which include a rationale. They are then further divided into benchmarks for grades 4, 8, and 12. Content Standard “C” is where environmental issue investigation skills are covered. Once students reach eighth grade they are expected to begin using investigation to “...explain the role of beliefs, attitudes, and values” in environmental issues (WI DPI, 1998). Content Standard “D” is entitled Decisions and Actions Skills and states “Students in Wisconsin will use findings from environmental issue investigations to develop decision-making skills, and to gain experience in citizen action skills (WI DPI, 1998). Content standard “E’s” subheading, Personal and Civic Responsibility, refers to citizen participation. This standard states “Students in Wisconsin will develop an understanding and commitment to environmental stewardship” (WI DPI, 1998).

It is my opinion that the above-mentioned standards receive limited attention from most educators. Many will argue that they already have too much to teach and there isn’t time to add new materials, while others feel that they are unprepared to include these skills in their lessons. At the same time, I feel that these two standards are necessary in the process of developing environmentally literate citizens. If this study proves that citizen action skills and participation improve environmental attitudes, educators will have more reason to implement them.
Overview of NAAEE "Excellence in Environmental Education – Guidelines for Learning (K-12)

The North American Association for Environmental Education has published *Excellence in Environmental Education – Guidelines for Learning (K-12)* in order to provide a set of guidelines for educators and the public to use as a common base for learner expectations. Similar to state and national standards, the NAAEE guidelines are set for achievement and performance in 4th, 8th, and 12th grades. Four common strands appear at each of the three achievement levels throughout the guidelines. The four strands are “Questioning and Analysis Skills”, “Knowledge of Environmental Processes”, “Skills for Understanding and Addressing Environmental Issues”, and “Personal and Civic Responsibility”. One important part of these guidelines is that they directly reference pages in the national standards to show connections with other disciplines. This is extremely beneficial when looking at infusion of EE into existing curricula.

Strand Four entitled “Personal and Civic Responsibility,” recognizes that “Environmentally literate citizens are willing and able to act on their own conclusions about what should be done to ensure environmental quality” (NAAEE, 1999). Citizens who have previous experience with citizen action skills and participation should also be willing and able to take action on environmental issues. It can be assumed that those citizens possess a positive environmental attitude. One way to promote a positive environmental attitude is to expose students to situations where they can be active and successful on an environmental issue. *The Excellence in EE Guidelines for Learning (K-12)* helps educators and the public to identify specific skills necessary to help create that environmentally literate citizen.
Current Status of Environmental Education and Action Skills Instruction in the Edgar Area School District’s Fifth Grade Curriculum

Not surprisingly the current fifth grade at Edgar Elementary School focuses on the first two subgoals of EE. Students are subject mainly to instruction aimed at providing knowledge of scientific and environmental concepts. Topics such as relationships between people and their environment are covered in the Social Studies curriculum, while ecological concepts like the cycling of matter and flow of energy are covered in Science. While not intended exclusively for Environmental Education, action skills instruction in the Language Arts curriculum such as persuasive writing and speaking was present. Some individual teachers also used environmentally related literature as a tool for reading. The next sign of other action skills instruction is in the seventh and eighth grade Social Studies curriculum where students are instructed in how civic action such as voting and running for political office can contribute to the well-being of the community (Edgar Elementary and Middle School Curriculum, 1987). Unless, individual teachers are having students use the acquired citizen action skills, there is no evidence of actual citizen participation written into the Edgar elementary or middle school curriculum.

Summary

The Wisconsin and federal governments have emphasized the importance of environmental education through laws such as the National Environmental Education Act (1990) and Wisconsin Environmental Education Act (1990). With this in mind, we must remember it is through our actions that the environment is improved, sustained, or destroyed. Therefore, it is our responsibility to educate today’s youth to act responsibly when dealing with the environment. By using current EE curriculum, we can enable
students to become aware of and knowledgeable about environmental concepts and issues. Since responsible environmental behavior is the end product of environmental education we must also include citizen action skills instruction and opportunities for participation. Through this process students will form attitudes towards the environment that will lead to responsible environmental behavior.
Chapter III
METHODS

The intentions of this project are to design and implement a citizen action skills and participation unit into the Edgar 5th grade with the hopes that it will have an impact on students' environmental attitudes. This project will begin with input from teachers by forming an environmental committee. The committee will identify citizen action skills and participation projects in which students will participate. Pre and post surveys will be completed by both Edgar 5th grades to determine if the projects had an impact on their environmental attitudes.

Estimated Project Timeline

July 2001-August 2002

1. Initial plan for EE project developed, July 2001

2. Explanation of project to EES principal, August, 2001

3. Organization of Environmental Committee, September 2001

4. Identification of Community of Environmental Projects, October 2001

5. Development of action skills unit plan, October 2001-December 2001


7. Administration of pre-assessment instrument, March 2002

8. Instruction of action skills unit plan, September-April 2002-May 2002

9. Student involvement in community environmental projects, May 2002

10. Administration of Post Assessment Instrument, May 2002
Subproblem One: Identify Community Environmental Projects

This process will start out by forming an environmental committee of teachers and the elementary principal during the fall of 2001. The committee will be comprised of teachers from physical education, special education, elementary education, middle school, and high school, as well as an elementary principal. Monthly meetings will be held in order for committee members to discuss ways to involve students in environmental activities.

Once the Environmental Committee is set up, the next step will be to brainstorm community environmental project ideas as well as continually promote environmental education activities during the school year. Some ideas will involve the entire elementary school while at least one or more will be chosen for fifth grade students. The projects identified for fifth graders will be the projects focused on in this paper. After identifying the community environmental projects, Bob Christianson, elementary principal, and Dennis Weix, President of the Village of Edgar, will be contacted to obtain permission to proceed with the projects.

Subproblem Two: Identify Action Skills

After the environmental committee has decided on environmental projects, the action skills necessary for participation and completion of these projects will be
identified. Possible citizen action methods to be used in the projects could be persuasion or ecomanagement.

**Subproblem Three: Development of Action Skills Unit Plan**

The third subproblem will be the development of lesson plans during the fall and winter of 2001 school year. After looking at the EE standards, the Edgar School District curriculum, and the necessary action skills, a new curriculum will be developed to meet the needs of these combined areas. Even though this project will be primarily concerned with ecomanagement action skills, students will also need background information about the action projects they will be involved in. Therefore lesson plans will be identified or developed to teach students about each environmental project to be implemented. Lesson plans will also be developed to instruct students in the area of safety if projects take us out of the classroom or off school grounds.

**Subproblem Four: Identify an Assessment Instrument**

The fourth subproblem will be to identify an assessment instrument to determine students' attitudes toward the environment. During January of 2002, attitude assessment instruments will be researched to determine which will be most relevant to the project. Assessments used for similar projects will be given priority during the research process.

**Subproblem Five: Administer the Pre Citizen Action Unit Assessment Instrument**

The pre-assessment instrument will be administered to the entire fifth grade class at Edgar Elementary School in March of 2002. The assessment will be proctored by,
myself, the fifth grade teacher. Information found from the assessment will be used as a baseline to determine current environmental attitudes of the fifth grade students. It will later be compared to post assessment results to determine the impact of the action skills curriculum.

Subproblem Six: Implementing Action Skills Curriculum

The sixth subproblem will be to implement the action skills unit into the current curriculum during the April and May of 2002. Once the action skills unit plan is developed, it will be infused into two or more core subject areas. The lessons involving background knowledge about the projects will be infused into science and reading classes. The instruction will vary from lectures and guest speakers to hands on activities and field trips. Some lessons will involve students being in groups, while others will require students' individual efforts.

Subproblem Seven: Community Environmental Projects

The seventh subproblem will be to involve the students in the identified community environmental projects. This will occur upon completion of infusion of the curriculum during May of 2002. Students will be given the option to participate in the projects that will involve ecomanagement action skills or an alternative activity. The projects will take place on school grounds or within walking distance of the school. Students will be expected to participate in the environmental projects or alternative activities related to the lessons if they do not agree with the intentions of the projects.
Subproblem Eight: Administer Post Citizen Action Unit Assessment Instrument

The assessment instrument will again be administered to the entire group of fifth grade students in May of 2002 upon completion of the community environmental projects.

Subproblem Nine: Analyze and Interpret Data

Upon student completion of the assessment, they will be analyzed. To determine if the citizen action skills unit had an impact, the results from the pre and post surveys will be compared. The questions will be divided into the following three categories for comparison. Questions relating to student attitudes toward learning about the environment, questions relating to environmental issues covered in the unit, and finally, questions about environmental issues unrelated to the unit taught. The results will then be used to determine the effects of the action skills unit on students' attitude toward the environment.
Chapter IV
RESULTS

Actual Project Timeline

July 2001-August 2003

1. Initial plan developed, July 2001

2. Explanation of project to EES principal, August 24, 2001

3. Organization of Environmental Committee, August 28, 2001

4. Initial Environmental Committee meeting, October 4, 2001

5. Identification of Community Environmental Action Skills Projects, November 14, 2001

6. Development of action skills unit plan, November 2001-February 2002


8. Administration of pre-assessment survey, April 15, 2002

9. Instruction of action skills unit plan, April 16-May 24, 2002

10. Student involvement in storm-drain stenciling action project, April, 30 2002

11. Student involvement in wood duck nesting box action project, May 7-May 24, 2002


14. Completion of written project, August, 2003

Subproblem One: To identify environmental action projects in the Village of Edgar

On August 28, 2001 an environmental committee was formed as part of a staff meeting. The committee was comprised of three elementary teachers, an elementary art
teacher, and the elementary principal when available. While teachers from middle school and high school were solicited, none of them chose to be part of the committee. A few high school teachers offered their help during projects if needed.

On October 4, 2001 the environmental committee met and discussed school wide environmental action projects. As a result of meeting I found that the types of action environmental project ideas coming up did not meet the needs of my project criteria. However, many ideas for school wide projects unrelated to my graduate project arose from the committee meetings. Two examples of school wide action projects that were implemented were a school forest clean-up day and an extensive Arbor Day celebration. The cleanup was held October 25, 2001 for students in pre-K to 8th grade and the Arbor Day Celebration, April 26, 2002, included elementary student displays on forest concepts such as management, recreational use, forest products, and photosynthesis. Students in from Kindergarten to eight grade participated in the Arbor Day celebration.

After a lengthy discussion at our November 5, 2001 environmental committee meeting, it was decided that in order to meet the needs of this study, additional fifth grade projects would be carried out in addition to the school wide environmental projects. On November 8th, still without any adequate community environmental project ideas for the fifth grade students, I consulted the Wisconsin Department of Natural Resources as well as the Village of Edgar President. Rick Weide, a wildlife biologist from the DNR, suggested some stream monitoring activities that were not feasible at the time. Mr. Dennis Weix, Superintendent of the Village of Edgar President, was unable to assist in identifying any projects, but offered any assistance that was needed once projects were underway.
Eventually, the idea of expanding an existing pond study into an extensive water unit arose, including the idea of building wood duck nesting boxes. After discussing the project with Bob Christianson, elementary/middle school principal, he suggested that I also include storm drain stenciling within my unit. At that point it was decided that the community environmental action projects would entail storm drain stenciling and building wood duck nesting boxes.

Subproblem Two: To identify citizen action skills that would be useful for the project

Once the decision was made to do the storm drain stenciling and wood duck nesting box projects, it was necessary to identify useful citizen action skills to complete them. After consulting with Dr. Dennis Yockers, Associate Professor of Environmental Education, University of Wisconsin Stevens Point, it was decided that the community environmental projects would emphasize ecomanagement and persuasion action skills. Ecomanagement action skills are those that require persons to physically become involved in an environmental project. The persuasion skills were part of the storm drain-stenciling project since persuading community members to keep pollutants out of storm drains. Therefore, the curriculum focused on ecomanagement and persuasion skills necessary for the identified projects. The specific skills necessary for the storm drain stenciling included locating storm drains, the best methods in spray-painting the stencils, and thorough understanding of traffic and pedestrian safety rules. The specific skills necessary for building the wood duck nesting boxes were a strong understanding of the
Subproblem Three: To identify or develop lesson plans for the citizen action skills unit plan

After researching various water related lessons and unit plans during January and February of 2002, the unit plan (Appendix A) to be implemented was designed. It included lessons from Project Learning Tree, Project WILD Aquatic, Water Action Volunteers (WAV), and teacher-developed lessons. The lessons would include intensive background knowledge about many water related topics. The lessons that were directly related to storm drain stenciling included concepts like watersheds, runoff, water pollution, and human impacts on water sources. The lessons that were directly related to the wood duck nesting box project were mainly dealing with different types of aquatic wildlife and more specifically the wood duck. Rick Weide, from the Wisconsin Department of Natural Resources, would also be a guest speaker who focused on wood duck habitat and proper methods of building and placing wood duck nesting boxes.

Before the community environmental action projects could get underway, two issues needed addressing. On March 11, 2002 I attended a PTO meeting to present my request for financial assistance to purchase the project supplies (Appendix B). Financial assistance of up to $800.00 was granted by the PTO based on estimates of lumber, nails, screws, hinges, and paint needed for the projects (Appendix B). Schueller Builders was contacted March 13, 2002 about providing the supplies needed for the projects. All of the supplies were picked up on April 17, 2002 except for the 16-foot boards for the
nesting boxes, which were delivered on May 2, 2002. Next, parent helpers needed to be contacted and recruited. A PTO member was contacted on April 15th to coordinate the parent volunteers to help with the projects. The PTO member contacted several parents of fifth grade students to help on the dates of April 30th for the storm drain stenciling, and the weeks of May 6 and May 13, 2002 with the construction of the wood duck boxes.

Subproblem Four: To identify an assessment instrument to measure the attitudes of Edgar Elementary School fifth grade students towards the environment

After analyzing assessment instruments during February 2002, I found that the “1994 Environmental Survey of Wisconsin’s Fifth Grade Students,” conducted by the Wisconsin Center for Environmental Education (1997), best fit the purpose of the assessment. This specific survey was used to assess the environmental literacy of Wisconsin 5th grade and high school students during a 1994 study. Since the purpose of the project is to assess the impact of an citizen action skills unit plan on students environmental attitudes, it was decided that a modified version that would focus on assessing attitudes of the fifth grade students would be used (Appendix C).

Subproblem Five: To administer the assessment instrument and analyze the results to determine the environmental attitudes of Edgar Elementary fifth grade students prior to the action skills unit

Fifty Edgar fifth grade students were given the pre-survey instrument on April 15, 2002. The students were given a forty-five minute time frame to complete the surveys, all of which were completed in that time. The students all seemed very excited to be
participating in the study. Questions were grouped into three separate categories for interpretation. The categories were: questions related to learning about environmental topics, questions that were directly related to the water unit taught, and questions about other environmental topics.

The pre-survey results (Appendix D) revealed that compared to other subjects, 60% of the students enjoyed learning about environmental topics about the same as other subjects, and 34% enjoyed environmental topics more. One hundred percent of the students felt that they understood environmental problems about the same as other students their age. The survey also showed that 80% of the students felt that they learned more about environmental topics from areas other than school. This statistic itself may reveal a lot about current environmental education practice in Edgar Elementary School.

Of the questions on the survey, numbers 8, 9, 12, 18, 20, 21, 23, 24, 25, and 27 were considered related to the water unit taught for the project. Since the unit taught involved water, question #12, which states, "It is okay if a little water gets polluted because there is plenty of water," could show to be extremely important. The pre-survey revealed that student attitudes were varying with 36% of the class agreeing or strongly agreeing with question #12, while 30% either disagreed or strongly disagreed with the statement. The other 34% had no opinion on the issue. Question #20 states, "Things I do have no effect on the quality of the environment." Students overwhelmingly, 70%, said they had no opinion about this statement. This seems to show a lack of students seeing a connection between their actions and the environment. Students also revealed their attitudes on the importance of improving animal habitat in question #23. Fifty percent agreed or strongly agreed that improving animal habitat is important, while 12% disagreed and 14%
strongly disagreed with the statement. Finally, question #27 asks students to reveal their concern about environmental health and hazards caused by air or water pollution. The pre-survey showed that 60% of the students were concerned or strongly concerned about the issue, while 30% were unsure. Only 10% stated they were not concerned with the issue.

The third category the questions were grouped into were those that dealt with environmental issues not discussed during the actions skills unit. Some of the topics covered in this category were energy consumption, human population, and recycling. Questions #15 and #22 show how students feel about energy use. An interesting result of the pre-survey showed that 50% of the students were willing to watch one hour less of television per day to help save energy. I thought this might be higher since this would be such a simple way to save energy. The pre-survey also showed that 60% of the students are concerned about turning out lights in a classroom even though the school pays for the electricity. The issue of human population showed almost half of the students had no opinion on the issue, while 24% stated they were concerned with how large the human population is becoming. The final third of the students revealed that they were not concerned. Question #17 showed student attitudes about throwing away recyclables. Since there has been such a push to promote recycling in schools I was very surprised that only 26% of the students revealed they would be bothered by throwing an aluminum can in the trash and half of the students had no opinion on the issue.
Subproblem Six: To implement the citizen action skills unit plan through core subject areas

During the week of April 15, 2002 the action skills unit plan was initiated. The plans were implemented into science and reading classes in April and May. Students were instructed in several areas including background knowledge on the hydrologic cycle, watersheds, run-off, and point and non-point source water pollution. Students were also instructed on household water and how it is obtained and treated or disposed of within and outside of the Village of Edgar. These lessons led to a fieldtrip to the Village of Edgar Waste Water Treatment Plant on April 23rd to allow students to see first hand where the city water goes once it leaves homes and businesses. Students displayed a variety of reactions once they realized what happened at the waste water treatment plant. Many students were disgusted about the process while others were completely intrigued and couldn’t stop asking questions. One of the most interesting facts about the water was that even though it came in as waste water, it left the treatment plant by entering Scotch Creek, a full 90% cleaner than the original creek water.

Once the background information was given, students were instructed in the citizen action skills lessons for the first community environmental project. Those lessons included the methods of storm drain stenciling and road safety. Skills needed for storm drain stenciling included positioning and securing the stencil by holding it down with wooden blocks in the best location depending on the storm drain, the best height to spray from, and the best motion used to spray the paint. Once those skills were presented each student was given the opportunity to practice spray-painting a letter onto cardboard. On April 30, 2002, before students were taken out into the community to spray paint storm
drains they were instructed on road safety. The main points of the lessons were to use sidewalks at all times while not stenciling, always wear orange vest, have two spotters watching for traffic, set up orange safety cones, and always stay with the adult group leader. Two weeks prior to this the Edgar PTO was contacted via phone call to coordinate parent volunteers to help with the project. Unfortunately, parent involvement was less than expected due to some cancellations. Each of the two fifth grade classes ended up with two parent helpers as well as myself to lead groups of students during the project. So, rather than groups of four or five students, the classes were split into three heterogeneous groups of eight or nine students. Orange safety vests donated by the Edgar Lions Club were given to each student and adult. Each group was also given one storm drain stencil, two wooden blocks, three orange safety cones, and a spray paint can.

Once the storm drain-stenciling project was completed the class moved onto lessons dealing with aquatic animals. While there were lessons about other animals, such as aquatic insects, the wood duck was the animal that was focused on. During reading and science classes students read about and were instructed about specific qualities of wood ducks including the plumage as well as habitat and food requirements. On May 2nd guest speaker Rick Wiede, a wildlife biologist for the Wisconsin Department of Natural Resources, discussed topics such as migration, habitat, predators, and population of wood ducks. During his lesson we were informed that the current population of wood ducks in our area matches the amount of habitat available quite well. The original idea was to build 18 wood duck nesting boxes and put several of them up in two areas that match wood duck habitat requirements near the school. However, after the Mr. Wiede informed the class that the natural nesting cavities available were adequate in number, it was
decided that only one nesting box would be put up in a 10-acre wetland area. The rest of
the wood duck nesting boxes would be given to local property owners who had
appropriate wetland habitats for them.

After completion of the background lessons on wood ducks were completed, the
citizen action skills lessons began. The first lesson was a review lesson on measurement
along with instruction on how to read the nesting box design sheet (Appendix A). Before
the class was ready to begin building, I consulted with the high school vocational
education teacher to provide volunteer high school students to aid in teaching appropriate
and safe use of hammers and cordless drills. Due to safety concerns, the cordless drill
safety instruction would be led by myself. Since, the boards were bought in 16’ lengths,
high school students also assisted in the projects by cutting boards into workable 8’
lengths. On May 6, 2002 students were instructed on safety issues of building the nesting
boxes. Since students would be using hammers, nails, cordless drills, and screws, they
were required to wear safety glasses. Once all students had goggles, they were divided
into groups where high school students assisted in instructing them on the safe and
appropriate use of hammers and drills. Each student was given an opportunity to hammer
three nails into a board and use the cordless drill to screw two screws into a board for
practice. Many of the students were excited about finally getting started with the
construction of the boxes. A few students were hesitant to use the hammers and cordless
drills, but with some assistance they quickly overcame their fear.
Subproblem Seven: To involve students in community environmental projects in which citizen action skills may be applied

On April 29, 2002 the storm drain stenciling action skills lessons were completed. The next day three groups of seven or eight students led by parent volunteers and the teacher, were formed to begin the project. Each group was in charge of stenciling the storm drains on two previously determined streets in the Village of Edgar. Students were required to wear orange vests and stay with their parent volunteer during the entire activity. The group leaders then took their groups to designated streets located north of the school building to spray paint the stencil by their assigned storm drains. Each student was given the opportunity to hold the stencil while another student painted it and paint the stencil while other students held it (Appendix E). Orange safety cones were set up about 20 feet on each side of the storm drains and two students in each group stood on the sidewalk watching for traffic. Most students followed the safety rules, however the excitement of getting to participate in an outdoor activity sometimes contributed to students running ahead to the next storm drain. Other problems that occurred were complaints about being cold due to high winds and cold temperatures. The excessive winds also led to people getting paint on their coats as well as difficulty in spray painting because the paint smeared as it was being sprayed. Some students who encountered difficulty painting showed signs of discouragement. The project lasted about 45 minutes for each class and all groups met back at the school in the parking lot.

After completing the storm drain stenciling project students were immediately taught the previously mentioned lessons for the wood duck nesting box project. Building of the wood duck boxes began on May 7, 2002 with students being put into groups of two
or three. Once the groups were organized students started measuring all of the pieces for the nesting boxes. Measuring the sides, roof, and floor took two days to complete. The second evening was spent cutting the measured pieces out so students could begin putting the nesting boxes together the next day.

On May 8, 2002 students began nailing the boxes together. Each student in the groups was given the opportunity to nail parts of the boxes together (Appendix E). Some groups had troubles with nailing due to the wood splitting when the nails went through. After six school days of building, all of the groups had put the four sides and floor of the nesting boxes together. The next step was mounting the roof on the box with hinges. On May 16, 2002 students began drilling guide holes for the screws to attach the hinges. Since there were only two parent volunteers and myself, only three groups could be drilling holes at a time. Once the guide holes were drilled, the students were given eight screws and a screwdriver to attach the hinges to the box so the roof could be put on. Within two days all groups had attached their roofs to the nesting boxes.

On May 20, 2002 a PTO member was contacted to organize parent helpers for putting up the wood duck nesting box at Minnow Ponds. One parent volunteer was available to assist while putting up the box. Dennis Weix was also contacted to obtain the 12 foot 4”x4” post, which was donated by the Village of Edgar. For whatever reason it took several days before the post was actually delivered to the nesting box location. On May 24, 2002, the last day of school, the class walked to Minnow Ponds Park to locate the exact spot for the nesting box. Due to the area being a wetland with ponds all students were kept in one large group to avoid accidents. After locating the spot several things were accomplished. First, previously organized student groups of three took turns
digging the hole for the post of the nesting box. Students ran into rocks while digging which caused the event to take much longer than anticipated. While that was occurring other groups were attaching the box to the post with bolts. During the event several behavior problems arose. Students who were waiting to participate or had finished their part, became bored and began misbehaving. Throwing grass and running around chasing each other were two problems that had to be dealt with. When all groups were given an opportunity to dig part of the four-foot hole or help attach the box to the post, the box was put in place and groups of students filled in the hole.

Subproblem Eight: To administer the post assessment instrument

Upon completion of building the wood duck nesting boxes, the class participated in a wrap up discussion on the water unit and projects. Due to time constraints and not knowing when the Village of Edgar would bring a post for putting up the box, the students had to take the post survey before putting up the wood duck box up. After giving students a few days to reflect on the whole process, they were given the post assessment instrument. This took place on May 22, 2002 and 50 students participated in completing the post survey.

Subproblem Nine: Analyze and interpret data from the post assessment survey

The fifty Edgar 5th grade student post assessment surveys were analyzed during June of 2002. Again the survey questions were divided into categories relating to student attitudes toward learning about the environment, environmental issues related to the action unit, and other environmental issues.
The post survey results (Appendix D) revealed that student attitudes toward
learning about the environment were impacted by the water action unit. The majority of
students, 80%, revealed that they learned about the environment in school according to
the post assessment survey. After implementing the action skills unit, 60% of the
students stated that they were more interested in learning about environmental topics than
other subjects they study. Also, after participating in the citizen action projects, 72% of
the students stated they wanted to spend more time learning about the environment.

Some questions were categorized into a group directly relating to the water action
unit. One such example is question #12, which showed that 90% of the students
disagreed or strongly disagreed with the statement, “It is okay if a little water gets
polluted because there is plenty of water.” The post survey results for question #20,
which states, “Things I do have no effect on the quality of the environment,” conveyed
that 66% of the students disagreed with the statement. The post survey also showed that
72% of the students felt that improvement of animal habitat was important. Post survey
question #27 indicated that 90% of the students are concerned about environmental health
and hazards such as those caused by air and water pollution.

The final category of questions was dealing with environmental issues not related
to the unit taught. Question #15 of the post survey, which discussed student willingness
to watch less of television to save energy, revealed that 44% of those surveyed were
willing to watch less television. Question #22 the post survey showed only 54% of the
students were concerned about turning out the lights in a classroom after the CASP. A
second area not covered in the water action unit was human population. The post survey
showed that 30% of the students were concerned with how large the population is
becoming. Another question dealing with an environmental issue unrelated to the unit taught was one relating to recycling. Only 30% of the students stated it would bother them to throw an aluminum can in the trash.
Chapter V
CONCLUSIONS AND RECOMMENDATIONS

The purpose of this project was to develop and implement a citizen action skills and participation unit with the intent to assess how it would impact 5th grade students’ attitudes towards the environment. Upon completion of this study a comparison between the pre and post surveys revealed that implementing the citizen action skills and participation unit had an impact on students’ environmental attitudes (Appendix F). The survey questions were divided into categories relating to student attitudes about learning about the environment, environmental issues related to the action unit, and other environmental issues.

Conclusions

The post survey revealed that student attitudes toward learning about the environment were impacted by the water action unit. After implementing the action skills unit, 60% of the students stated that they were more interested in learning about environmental topics than other subjects they study, compared to 34% in the pre-survey (Figure 5.1). Initially, 54% of all students surveyed indicated that they wanted to spend more time learning about the environment, while after participating in the citizen action projects the amount increased to 72% (Figure 5.2). While there was a 26% increase in students who felt more money should be spent on teaching people about the environment, there was only a slight increase in students who felt that their school should have more lessons about the environment.
Figure 5.1: Comparison of Pre and Post Survey Responses to Question #1

Figure 5.2: Comparison of Pre and Post Survey Responses to Question #5

Of the survey questions, some categorized as being related to the water action unit showed that the action plan had an impact on student attitudes. One such example is question #12 (Figure 5.3), showed a 60% increase in students who disagreed with the statement, “It is okay if a little water gets polluted because there is plenty of water.” Since water was the core topic of the action unit this result was expected. Another question that revealed an impact on student attitudes was question #20 (Figure 5.4),
which states, “Things I do have no effect on the quality of the environment.” The pre-survey showed only 10% of the students disagreeing with the statement. The post survey results conveyed that 66% of the students disagreed with the statement. The post survey showed that improvement of animal habitat also grew in importance to students. Originally, 56% of the students surveyed revealed it is important to improve animal habitat. After implementing the water action unit the post survey indicated that 72% of the students felt that improvement of animal habitat was important. Post survey question #27 revealed an impact with students being concerned about environmental health and hazards such as those caused by air and water pollution. The pre-survey showed 60% of the students being concerned with the issue, while the post survey indicated that 90% of the students were concerned with that same issue.

**Figure 5.3: Comparison of Pre and Post Survey Responses to Question #12**
As for the questions dealing with environmental topics not covered in the action skills unit the results were less successful. First, dealing with the issue of energy consumption, student attitudes showed a decrease in concern. Question #15 of the post survey, which discussed student willingness to watch less of television to save energy (Figure 5.5), revealed that 44% of those surveyed were willing to watch less television while the pre-survey showed 50% were willing to reduce the amount of time watching television. Another question on the post survey that showed a slight decrease in concern was #22. The pre-survey revealed that 60% of the students were concerned about turning out the lights in an empty classroom while the post survey showed only 54% being concerned about the same issue. A second area not covered in the water action unit was human population. The post survey showed that 30% of the students were concerned with how large the population is becoming, in contrast with the pre-survey that found 24% of the students concerned. This small increase may indicate that students did not make a connection between the size of the human population and its possible negative effects on the environment. Another question showing a very small increase in concern was one relating to throwing an aluminum can in the trash. Before the water action unit
26% of the students stated it would bother them to throw an aluminum can in the trash, while after the unit the amount increased by only 4% (Figure 5.6).

Figure 5.5: Comparison of Pre and Post Survey Responses to Question #15

![Graph showing comparison of pre and post survey responses to Question #15.]

Figure 5.6: Comparison of Pre and Post Survey Responses to Question #17

![Graph showing comparison of pre and post survey responses to Question #17.]

The post survey reveals two important things about student attitudes toward the environment. First, the survey seems to indicate that once students are involved in an environmental action skills unit, more of them will be interested in studying environmental topics, and they will want to spend more time learning about them.
Students who participated in the citizen action skills unit also indicated that compared to other students their age they better understand problems related to the environment. This result shows confidence in the students understanding of environmental problems, which may lead to more involved citizens. These results seem to support implementing more citizen action skills and participation units into our curriculum.

The second thing revealed by the post survey was that the students' attitudes toward environmental topics covered in the water action unit were impacted more than their attitude about environmental issues not covered within the unit. Topics related to water and wildlife proved to be important to more students after participating in the CASP. It seems that because these issues were more concrete, being directly tied to the unit taught, students had an easier time making a connection with them, resulting in a more noticeable impact on their attitudes toward these topics. This leads me to believe that a variety of action skills projects should be implemented throughout the year to expose students directly to more environmental issues.

**Recommendations**

The feeling of satisfaction and reward was unimaginable once this project was complete. I have learned many things not only about including citizen action skills and participation units in my teaching, but also about teaching strategies and students' interest in doing longer lasting projects. However, the long process has brought to light many things that could be improved for future citizen action skills and participation projects.

My first recommendation is to be sure to include as many staff and students in these projects as possible. I really feel that the more people that are involved in the
projects the better chance there is for success and regular implementation of environmental education in school. One way to get staff involved is by forming an environmental committee that meets regularly. It is important for the committee to meet regularly otherwise teachers may lose interest in continuing environmental projects.

Next, it is very important to research thoroughly the action skills projects to be completed. Since there has been a lot of publicity in outdoor publications to build wood duck nesting boxes, I thought that would be a great project to involve my class in. A few days into the project Rick Weide of the WI DNR informed the class that the actual amount of natural habitat in our area already matched the local populations of wood ducks. Therefore, the eighteen nesting boxes that we intended to put up throughout the community would not be necessary. This led to a simple solution of giving the boxes away to local landowners who had the appropriate habitat to put up one wood duck box. After running into this problem I would suggest checking with the DNR early in the planning stages about the need for your specific projects.

Another recommendation is to be sure that you have adequate strategies to keep students involved and focused during the project. The actual building of the nesting boxes took about two weeks of on and off working due to other school activities. During this time some students seemed to lose interest, which occasionally contributed to behavior problems. It is important that a project that should take two weeks can be worked on consistently for that time. Also, since students work at different paces when building things, be sure to have additional activities available for those who finish early. Some possible activities are writing in a journal or create posters to inform other citizens about the wood duck. Students need to see an end and have closure on these projects and
you must remember that they may not have the same enthusiasm as you do about longer projects.

Depending on the level of students being taught, teachers must also remember that younger students may not be able to create as high of quality product as anticipated. After building a wood duck box as a model, I had hoped that the students would be able to produce great looking nesting boxes. I soon learned that 5th graders make mistakes and nails can split wood. One way to avoid wood splitting is to pre-drill the nail holes. In short, as long as the product that is expected will serve its purpose, don’t put too much emphasis on its appearance.

Additionally, it is important to do a variety of different types of projects that address different environmental issues. Being exposed to a variety of issues will affect students’ attitudes towards more than one area of the environment. This will allow for a better understanding of the effectiveness of citizen action skills and participation being taught in schools. If it is not possible to do a variety of citizen action skills and participation projects, it is important to try to verbally address other environmental issues so students don’t just focus on one area.

Finally, one of the most important recommendations I can suggest is having enough parent volunteers to help during the projects. Since, I had a project that was ongoing, I needed volunteers almost each day during the construction phase of the wood duck boxes as well as putting one box up. One area where it is very important for extra help is during the measuring and cutting of the wood. Students in class will make mistakes while measuring and having several parent helpers can make fixing those mistakes very easy. As for cutting the pieces, I spent approximately seven hours cutting
out the pieces for the boxes. High school students can be invaluable if they can help cut
the pieces during their wood working class. Otherwise, finding a few parents that can
take some of the wood home to cut would also help a lot. It was also necessary to have
several parent volunteers during the storm drain stenciling day. Days in which parent
volunteers were limited or unavailable made progress and the quality of instruction very
poor if not miserable for both the students and myself.


APPENDIX A

Unit Plan
Lesson 1: Aqua Words

Materials: Writing Materials
Time: One 45 minute period
Curriculum Link: Language Arts, Science
Objectives: Students will be able to describe a variety of ways and reasons why water is important to people and wildlife.


Lesson 2: Water Wings

Materials: Soft music, water sounds, or tape recording of aquatic habitat, art materials (water paints, brushes, paper, containers for water); writing materials
Time: One or two 45 minute periods
Curriculum Link: Language Arts, Art, Science
Objectives: Students will be able to 1) illustrate the water cycle; 2) describe the interrelatedness of the world’s water; and 3) state the importance of water to people, plants and animals.


Lesson 3: How Wet is Our Planet

Materials: large display map of the world; a 12-inch diameter globe; a 5 or 10 gallon aquarium; bucket, trash can, or other container; writing materials; calculators; measuring cup; one quart container for every three students; one measuring tablespoon for every three students
Time: one 45 minute period
Curriculum Link: Math, Science
Objectives: Students will be able to 1) describe the amount and distribution of water on the earth in oceans, rivers, lakes, groundwater, icecaps and the atmosphere; and 2) make inferences about the importance of responsible use of water.


Lesson 4: Water Wonders Part A

Materials: cut strips, student page, 7 envelopes labeled for 7 stations, watch
Time: 50 minutes  
Curriculum Link: Science, Language Arts, Physical Education  
Objectives: Students will 1) simulate the paths that water takes in the water cycle, and 2) describe the importance of the water cycle to living things.


Lesson 5: Watershed in a Box

Materials: box cover, foam pieces, aluminum foil, permanent markers, spray bottle, cup of water, powdered, unsweetened drink mix – 2 or 3 different colors, bucket  
Time: 15 minutes  
Curriculum Link: Science  
Objectives: Students will 1) define a watershed; 2) use powdered drink mix to represent nonpoint source pollution and demonstrate how this pollution affects surface water; and 3) design a community that will try to minimize the effects of pollution on surface water.


Lesson 6: Where Does Water Run Off After School?

Materials: writing materials, yardsticks, long piece of twine with marks every yard, rain gauge, local rainfall data  
Time: two 45 minute periods  
Curriculum Link: Math, Science  
Objectives: Students will be able to describe relationships between precipitation, runoff and aquatic habitats.


Lesson 7: Wetland Metaphors

Materials: a large pillowcase or bag, small pillow, soap, eggbeater, small doll cradles, sieve, paper coffee filter, antacid tablets, small box of cereal, 3x5 cards with pictures that could be used to show other wetland metaphors  
Time: one or two 30-60 minute periods  
Curriculum Link: Science, Language Arts  
Objectives: Students will be able to 1) describe the characteristics of wetlands; and 2) demonstrate their understanding of the importance of wetlands to wildlife and humans.

Lesson 8: Household Water

Materials: pencils, paper  
Time: one 50 minute period  
Curriculum Link: Science, Health, Home Economics  
Objectives: Students will 1) become aware of where their community’s water comes from, how it is obtained, and how it is treated before use by investigating the operation of a local water treatment facility; and 2) understand where wastewater goes and how it must be treated by visiting a local wastewater treatment facility.


Lesson 9: Storm Drain Stenciling

Materials: Items for 4-6 people: 1-2 stencils, door hanger cards, map of stenciling area, parent permission slips, letter of authorization from the DPW for stenciling, 2 cans of spray paint, a wire brush to clean the gutter before painting, whisk broom, dust pan, 1-2 work gloves, 1-2 orange safety vests, 2 garbage bags, paper towels, traffic cones, duct tape, scissors, cardboard box the size of stencil  
Time: two 60 minutes periods  
Curriculum Link: Science, Art  
Objectives: Students will 1) learn about the sources of stormwater pollution, 2) understand why stormwater pollution is a threat to the environment, and 3) stencil messages next to storm drains to encourage others to be more aware of stormwater pollution.


Lesson 10: Migration Headache

Materials: large playing field, two paper plates for every 3 students  
Time: one 45 minute period  
Curriculum Links: Science, Language Arts, Math, Social Studies, Physical Education  
Objectives: Students will be able to 1) list limiting factors affecting populations of migrating water birds, 2) predict the effects of such limiting factors, 3) describe the effects of habitat loss and degradation of populations of migrating water birds, and 4) make inferences about the importance of suitable habitat for migrating water birds.

Lesson 11: DNR Speaker – Topic: Wood Ducks

Materials: Overhead projector
Time: one 45 minute period
Curriculum Links: Science, Language Arts
Objectives: Students will 1) identify the life cycle of wood ducks, 2) identify winter and summer range of wood ducks, and 3) identify local habitat requirements.

Lesson 12: Improving Wildlife Habitat in the Community

Materials: wood duck box design, wood for constructing nesting boxes, hammers, nails, screws, safety glasses, hinges, screwdrivers, cordless drill, tape measure, pencils, mounting posts (Material amounts will depend on number of students in class)
Time: three to five 45 minute periods
Curriculum Links: Science, Math, Social Studies
Objectives: Students will 1) review measuring skills 2) apply their knowledge of wildlife by describing essential components of habitat in an arrangement appropriate for the wildlife they identify, 3) measure and mark wood to be cut, 4) nail or screw nesting boxes together, and 5) participate in placing nesting box in proper habitat.

Wood ducks, Barrow’s goldeneyes, common goldeneyes, hooded mergansers, common mergansers and buffleheads are all cavity nesting ducks. They build nests in abandoned woodpecker holes or natural tree cavities caused by disease, fire or lightning. These ducks will also use a constructed nest box. Here are plans for a nest box that you can build, install and maintain. The design, which is used by the Ducks Unlimited Greenwing program, may even attract other cavity nesting birds such as kestrels, tree swallows, great crested flycatchers or screech owls.

Cedar is ideal*

Cedar lumber is recommended because it is naturally resistant to weather and insects. You can also use any materials you have available such as pine or plywood. The box pictured uses 10.5 linear feet of 1” X 10” (3/4” thick by 9 1/4” wide) lumber that is rough on one side (for the inside of the box).

*Ducks Unlimited staff in the interior of British Columbia indicate that plywood boxes better withstand the region’s temperature extremes.

Finishing touches

Ducks Unlimited does not recommend applying a finish to cedar boxes. A finish might help to extend the life of a plywood box.

If you decide to apply a finish to your nest box, use a nontoxic wood preserver or a light shade of an earth tone paint. The ducks will find your box by seeing the contrast in color caused by the entry hole. Do not apply finish inside the box.

Cavity nesting ducks do not carry nesting materials. It’s important to help them out by placing four to six inches of wood shavings in the bottom of the box. You can find wood shavings at your local pet or farm supply store. Do not use sawdust. It can suffocate ducklings.

Every year, in the fall after the nesting season has completed or in the winter, clean out old nesting material from the box and replace it with a fresh layer of wood shavings. This annual cleaning needs to be a part of your long-term maintenance commitment once you place your nest box.

---

**PROCEDURE**

Tools needed: handsaw or table saw, drill and 1/2” bit, jigsaw, screwdriver, sandpaper, pencil, measuring tape, straight-edge

1) Measure and cut your wood to produce the six pieces. Number the pieces as shown. See material measurements.

2) Attach the back (1) to the side (2) using four screws fastened from the back of the box. See exploded view (next page).

3) Drill five 1/2” drainage holes in the floor (3). Attach the floor by fastening two screws through the back and two through the side.

4) Draw the entry hole on the front (4) using a pencil (4 1/2” x 3 1/2” oval). Drill a pilot hole and cut out the entry hole using a jigsaw. See detailed view.

5) Score the inside face of the front (4) using a saw.
   The horizontal slots will provide toeholds when the ducklings climb out. See detailed view.

   continued ...
Finding the right place

Now that you've completed construction of your nest box, you need to consider where to install it. Be sure to place the box in a location that will be convenient for monitoring and annual maintenance.

Where to find tenants

To increase the chances of your nest box being used by waterfowl, it should be located in an area attractive to cavity nesting ducks. You'll see these birds using wooded wetlands that contain water year round or, at least, throughout the summer. You'll also see them using trees along riverbanks and lake shorelines.

Positioning your nest box

Nest boxes can be mounted on tree trunks or on steel poles beside the water or above the water.

- **Good placement**  a dead tree at the water’s edge
- **Better placement**  a solid dead tree in the water
- **Best placement**  boxes on poles near standing, flooded, dead trees

Live trees can be used for mounting boxes, but keep a close eye on your box. Growing trees may loosen mounts and make boxes less attractive to the birds.

- **Tree Trunks**
  Live and dead trees are suitable. If beavers are about, don't place nest boxes on poplar or white birch trees. Beavers eat these trees.

- **Steel Poles**
  Make sure the poles are fixed solidly in the soil, or marsh bottom, to ensure that the nest boxes are stable. Drill two holes in this pole to accommodate a predator guard (see below).

- Boxes should be placed above typical high water levels and at a height that will allow you to access the box for monitoring and maintenance (about 4 to 6 feet above land or water). In terms of distance inland, try to keep your box close to the water.

- Clear an unobstructed flight path to your nest box by removing branches that might be in the way.

- The entrance hole to the box should face the water.

- You can tip the box forward a little bit to help the ducklings reach the entrance.

---

PROCEDURE (continued)

6) Attach the front (4) using six screws.

7) Round the top, outside edge of the door (5). See exploded view. Fasten the door at the top with one screw from the front and one from the back. The two screws form the hinge and allow the door to open. Pin the door shut with a nail from the front.

8) Attach the roof (6) using four screws from the top and three screws from the back (be careful not to screw into the door). The box is now ready to install. Don't forget to put a 4-6 inch layer of wood shavings in the box for nesting material.

---

EXPLODED VIEW - not to scale

- **DETAILED FRONT VIEW** not to scale

---

53
Predator Guards

A predator guard will help to improve the chance of a successful hatch by preventing egg-eating raccoons from entering your nest box.

1) Steel Sheet Sandwich

36" X 49" sheet of 28 gauge steel
• Fold the sheet in half along the 49" length, creating a front and a back, each 24" wide
• Along one 36" side, make a 1" fold towards the inside centre
• Drill two holes, 34" apart (see diagram)
• Place your guard so it surrounds the pole or tree trunk. Slip the unfolded side under the 1" fold. Using vice-grips, bend the corners in to lock these pieces and prevent the guard from opening.
  • Pole mount: bolt the guard into place about 2" below the nest box.
  • Tree mount: nail the guard in place — if the tree is alive, check the guard often to ensure tree growth hasn't popped the guard off.

2) Plastic Pipe Guard

Metal or plastic pipe (stove pipe, sewer pipe) drilled at the top and bottom and bolted to the tree or pole makes an effective predator guard. To prevent small rodents from crawling through, place a crumpled piece of chicken wire between the pole and the guard.

3) Plastic "Crazy Carpet" Guard

A new use for children's inexpensive plastic snow riders located in any toy store. Wrap the carpet around the tree and tack it in place. Be sure to provide room to grow if you place this guard on a living tree.

Nest box maintenance — a long-term commitment

Once a cavity nesting bird starts using your box, you’ll likely see many broods raised over the years. Nesting sites for these birds are limited in number. When they find a good nesting site, there is a very good chance they’ll return in following years. When you put up a nest box you are committing yourself to maintaining that box. Fall and winter are the best times to remove old nesting material, tighten any loose screws and mounts, and add new wood shavings.

If you don’t have any ducks using your box over the summer, don’t worry. Waterfowl biologists have seen waterfowl migrating in the fall scope out potential nesting sites for next spring. This too is a good reason to keep your boxes in top condition. You never know when somebody might be popping in!

This information has been compiled from the Nest Box Guide for Waterfowl by Ducks Unlimited and the Canadian Wildlife Service, Environment Canada; and a Conservator article (Vol. 19, No. 3) by Mearl Rooney.
APPENDIX B

PTO Funding
Environmental Education Projects
5th Grade
Jon Albee

Goal- Introduce students to a variety of EE goals through an intensive water unit. Students will become aware of EE issues, gain knowledge on those issues, develop an attitude (values) about the issues, and finally if they choose, act on those values by participating in activities that involve using eco-management skills. Those skills will be developed during the activities. Other action skills will also be discussed during the unit such as consumer and legal action.

I. Water Unit
   A. Storm Drain Stenciling
      1. During the unit we will study where runoff goes and look at the storm drain system of Edgar. We will then spray paint messages by the storm drains to educate the public about the runoff.
      2. Supplies needed include: white spray paint, orange cones, orange safety vests, parent chaperones, and village approval for the project.

   B. Wood Duck Nesting Boxes
      1. During the water unit we will discuss specific wildlife that rely on water and wetland habitats. One animal will be the wood duck. We will then build wood duck nesting boxes to be put out for local wood duck populations.
      2. Supplies needed include: wood materials, mounting posts, screws, adult volunteers during the building process, and locations and approval to put up boxes.
Edgar Parent Teacher Organization  
April 1, 2002

1. Meeting began at 7:05 p.m. with 9 members present.
2. Approval of Agenda: Tammy Kornack added to agenda Renewal of CD.
3. Approval of Minutes.
4. Treasurer’s Report: Checking - $7,783.39; CD - $3121.43; Grant - $1,179.82. Tammy will renew the current CD for another 6 months.
5. Mr. Albee reported on the Environmental Projects he will be working on with the 5th grade students. A Water Unit consisting of Storm Drain Stenciling – Runoff Awareness. Building Wood Duck Nesting Boxes and a Stream Clean up Day. Mr. Albee requested money for purchasing wood for nesting boxed, paint for stenciling and garbage bags. He will need 8-10 adult volunteers to help with the above projects. A motion was made to approve an amount not to exceed $800.00 for the projects. All members present were in favor of the motion.
6. Suzanne Wolf reported a total deposit of $1,225.50. Younkers Benefit Sale: $260.00; Concessions: $36.50; Value Cards: $750.00; Easter Sucker Sale: $179.00.
7. Kelly Lukasko reported to PTO purchased candy and filled Easter Baskets for EC – 3rd graders. A suggestion was made to give other classes a “treat” in celebration of the Easter Holiday.
8. Spring Rummage Sale: Janet Faber asked to PTO for $200.00 to reimburse teachers for supplies needed for student crafts to be sold at Rummage Sale. She also requested volunteers to assist with receiving and marking items. A motion was made to approve the request for $200.00; all members present were in favor.
9. Pre-School Screening: The PTO put up posters and paid for the cookies for screening.
10. Mr. Christianson will be meeting with new parents on May 7th. He suggested putting together an informational handout informing them about the PTO.
11. Science Night: Great turnout! Great prizes!
12. Parent Teacher Conferences: PTO volunteers will bake bars for complimentary tables to be set up near the Elementary, M.S. and H.S. offices.
14. A Volunteer Breakfast is scheduled for April 26th from 7:00-8:00 a.m. Jane Rosewicz will submit an ad for the Record Review and send out flyers inviting PTO volunteers to the breakfast.
15. A motion was made to approve $400.00 for purchase of Planners for 3rd through 5th grades; all members present were in favor of this motion.
16. Middle School Lock In: Kelly Lukasko reported plans are under way to organize the lock-in which will be held on Friday, May 3rd from 6:00-10:00 p.m. A motion was made to approve an amount not to exceed $00.00; all members present were in favor of this motion.
17. CAT Carnival: Kelly Lukasko reported the carnival would be held on Thursday, March 23rd. She requested that the PTO pay $2.00 towards each student in grades EC through 5th. Students can begin earning carnival tickets on April 21st.
18. Post Prom Donation: A motion was made to approve $200.00 towards the purchase of a 25" TV from Wal-Mart and a $20.00 gift card from Best Buy. All members present were in favor of this motion.
19. Safety Patrol: Rachel Nowak has been selected to go to St. Louis with other top Safety Patrol students in the State. Three other students will be selected to go to Wisconsin Dells (funded by Edgar Lions). The remaining patrols will be going on a field trip to Menasha. A motion was made to pay $5.00 towards each safety patrol student attending the field trip to Menasha; all members present were in favor of this motion.

Meeting adjourned. The next PTO meeting will be held on Monday, May 6th at 7:00 p.m. in the LMC.
APPENDIX C

Environmental Attitude Survey
Environmental Survey of Edgar Fifth Grade Students

Part One

Instructions for Part One: Circle the answer that is most like you.

1. Compared to other subjects you study, how do you feel about studying environmental topics?
   a) less interested
   b) about the same
   c) more interested

2. Compared with other students your age, how well do you think you understand problems related to the environment?
   a) above average
   b) average
   c) below average

3. What one thing has contributed most to your understanding of the environment and environmental problems? (choose only one answer)
   a) school
   b) books, newspapers, or magazines I have read on my own.
   c) friends or family members (including parents)
   d) field trips, special programs or activities such as clubs, scouting, or 4H
   e) television programs
Part Two

Instructions for Part Two: The questions ask what you think. Be honest. There are no right or wrong answers. Read each question carefully. Circle the letter that is closest to what you think.

4. More money should be spent solving environmental problems.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

5. I want to spend more time learning about the environment.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

6. More money should be spent teaching people about the environment and its problems.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

7. My school should have more lessons about the environment.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree
8. I would be interested in joining a club that tries to protect the environment.
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

9. I would be willing to change my habits if it helped solve pollution problems.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

10. If a car makes too much air pollution no one should be allowed to drive it.
    a) Strongly Agree
    b) Agree
    c) No Opinion
    d) Disagree
    e) Strongly Disagree

11. How I travel to school each day is important because my energy use affects the environment.
    a) Strongly Agree
    b) Agree
    c) No Opinion
    d) Disagree
    e) Strongly Disagree

12. It is okay if a little water gets polluted because there is plenty of water.
    a) Strongly Agree
    b) Agree
    c) No Opinion
    d) Disagree
    e) Strongly Disagree
13. It is okay for our school to make the playground larger, even if it means destroying some endangered plants.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

14. The government should encourage people to have cars that are energy efficient.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

15. To save energy, I am willing to watch one hour less of television per day.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

16. I am concerned about how large the human population is becoming.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

17. It bothers me to throw an aluminum can in the trash.
   a) Strongly Disagree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree
18. It is a waste of time to work to solve environmental problems.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

19. When I have done something that harms the environment there’s little I can do to make right.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

20. Things I do have no effect on the quality of the environment.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

21. New buildings and roads are more important than protecting wildlife habitat.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

22. I don’t worry about turning out the lights in an empty classroom because the school pays for the electricity.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree
23. It is important to improve animal habitat.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

24. It is too hard to solve environmental problems.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

25. Environmental problems will only be solved when people like me change the way we live.
   f) Strongly Agree
   g) Agree
   h) No Opinion
   i) Disagree
   j) Strongly Disagree

26. I am not concerned about the rate of species extinction in the world.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree

27. I am concerned about the environmental health and hazards such as those caused by air or water pollution.
   a) Strongly Agree
   b) Agree
   c) No Opinion
   d) Disagree
   e) Strongly Disagree
APPENDIX D
Pre and Post Survey Results
Environmental Survey of Edgar Fifth Grade Students (N=50)

Part One

Instructions for Part One: Circle the answer that is most like you.

1. Compared to other subjects you study, how do you feel about studying environmental topics?

<table>
<thead>
<tr>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Less interested</td>
<td>6%</td>
</tr>
<tr>
<td>b) About the same</td>
<td>60%</td>
</tr>
<tr>
<td>c) More interested</td>
<td>34%</td>
</tr>
</tbody>
</table>

2. Compared with other students your age, how well do you think you understand problems related to the environment?

   | | Pre-survey | Post Survey |
   | a) Above average | 20% | 46% |
   | b) Average | 80% | 54% |
   | c) Below average | 0% | 0% |

3. What one thing has contributed most to your understanding of the environment and environmental problems? (choose only one answer)

   a) School
   b) Books, newspapers, or magazines I have read on my own.
   c) Friends or family members (including parents)
   d) Field trips, special programs or activities such as clubs, scouting, or 4H
   e) Television programs

   | | a) 20% | b) 20% | c) 30% | d) 20% | e) 10% |
   | | 80% | 10% | 0% | 0% | 10% |
Part Two

Instructions for Part Two: The questions ask what you think. Be honest. There are no right or wrong answers. Read each question carefully. Circle the letter that is closest to what you think.

4. More money should be spent solving environmental problems.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

5. I want to spend more time learning about the environment.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>14%</td>
<td>20%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>40%</td>
<td>52%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>46%</td>
<td>24%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

6. More money should be spent teaching people about the environment and its problems.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>26%</td>
</tr>
<tr>
<td>a) Agree</td>
<td>36%</td>
<td>40%</td>
</tr>
<tr>
<td>b) No Opinion</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>c) Disagree</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>d) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

7. My school should have more lessons about the environment.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>36%</td>
<td>40%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>
8. I would be interested in joining a club that tries to protect the environment.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>36%</td>
<td>20%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>10%</td>
<td>34%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

9. I would be willing to change my habits if it helped solve pollution problems.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>30%</td>
<td>56%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>36%</td>
<td>8%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

10. If a car makes too much air pollution no one should be allowed to drive it.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>40%</td>
<td>10%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>10%</td>
<td>16%</td>
</tr>
</tbody>
</table>

11. How I travel to school each day is important because my energy use affects the environment.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>14%</td>
<td>36%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>60%</td>
<td>54%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>10%</td>
<td>0%</td>
</tr>
</tbody>
</table>

12. It is okay if a little water gets polluted because there is plenty of water.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>26%</td>
<td>6%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>34%</td>
<td>4%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>26%</td>
<td>6%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>84%</td>
</tr>
</tbody>
</table>
13. It is okay for our school to make the playground larger, even if it means destroying some endangered plants.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>16%</td>
<td>4%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>14%</td>
<td>56%</td>
</tr>
</tbody>
</table>

14. The government should encourage people to have cares that are energy efficient.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>30%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>16%</td>
<td>46%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>64%</td>
<td>20%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

15. To save energy, I am willing to watch one hour less of television per day.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>30%</td>
<td>24%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>26%</td>
<td>24%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>14%</td>
<td>16%</td>
</tr>
</tbody>
</table>

16. I am concerned about how large the human population is becoming.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>46%</td>
<td>50%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>14%</td>
<td>20%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>16%</td>
<td>0%</td>
</tr>
</tbody>
</table>

17. It bothers me to throw an aluminum can in the trash.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Disagree</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>14%</td>
<td>6%</td>
</tr>
</tbody>
</table>
18. It is a waste of time to work to solve environmental problems.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Strongly Agree</td>
<td>6%</td>
</tr>
<tr>
<td>b)</td>
<td>Agree</td>
<td>20%</td>
</tr>
<tr>
<td>c)</td>
<td>No Opinion</td>
<td>4%</td>
</tr>
<tr>
<td>d)</td>
<td>Disagree</td>
<td>40%</td>
</tr>
<tr>
<td>e)</td>
<td>Strongly Disagree</td>
<td>30%</td>
</tr>
</tbody>
</table>

19. When I have done something that harms the environment there’s little I can do to make right.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Strongly Agree</td>
<td>10%</td>
</tr>
<tr>
<td>b)</td>
<td>Agree</td>
<td>26%</td>
</tr>
<tr>
<td>c)</td>
<td>No Opinion</td>
<td>40%</td>
</tr>
<tr>
<td>d)</td>
<td>Disagree</td>
<td>14%</td>
</tr>
<tr>
<td>e)</td>
<td>Strongly Disagree</td>
<td>10%</td>
</tr>
</tbody>
</table>

20. Things I do have no effect on the quality of the environment.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Strongly Agree</td>
<td>10%</td>
</tr>
<tr>
<td>b)</td>
<td>Agree</td>
<td>10%</td>
</tr>
<tr>
<td>c)</td>
<td>No Opinion</td>
<td>70%</td>
</tr>
<tr>
<td>d)</td>
<td>Disagree</td>
<td>6%</td>
</tr>
<tr>
<td>e)</td>
<td>Strongly Disagree</td>
<td>4%</td>
</tr>
</tbody>
</table>

21. New buildings and roads are more important than protecting wildlife habitat.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Strongly Agree</td>
<td>10%</td>
</tr>
<tr>
<td>b)</td>
<td>Agree</td>
<td>14%</td>
</tr>
<tr>
<td>c)</td>
<td>No Opinion</td>
<td>42%</td>
</tr>
<tr>
<td>d)</td>
<td>Disagree</td>
<td>16%</td>
</tr>
<tr>
<td>e)</td>
<td>Strongly Disagree</td>
<td>18%</td>
</tr>
</tbody>
</table>

22. I don’t worry about turning out the lights in an empty classroom because the school pays for the electricity.

<table>
<thead>
<tr>
<th></th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>Strongly Agree</td>
<td>16%</td>
</tr>
<tr>
<td>b)</td>
<td>Agree</td>
<td>0%</td>
</tr>
<tr>
<td>c)</td>
<td>No Opinion</td>
<td>24%</td>
</tr>
<tr>
<td>d)</td>
<td>Disagree</td>
<td>40%</td>
</tr>
<tr>
<td>e)</td>
<td>Strongly Disagree</td>
<td>20%</td>
</tr>
</tbody>
</table>
23. It is important to improve animal habitat.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>20%</td>
<td>48%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>36%</td>
<td>24%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>18%</td>
<td>10%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>14%</td>
<td>10%</td>
</tr>
</tbody>
</table>

24. It is too hard to solve environmental problems.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>24%</td>
<td>30%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>34%</td>
<td>40%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>20%</td>
<td>24%</td>
</tr>
</tbody>
</table>

25. Environmental problems will only be solved when people like me change the way we live.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>26%</td>
<td>20%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>30%</td>
<td>16%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>34%</td>
<td>24%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>6%</td>
<td>34%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>

26. I am not concerned about the rate of species extinction in the world.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>12%</td>
<td>6%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>36%</td>
<td>10%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>24%</td>
<td>4%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>10%</td>
<td>66%</td>
</tr>
</tbody>
</table>

27. I am concerned about the environmental health and hazards such as those caused by air or water pollution.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-survey</th>
<th>Post Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Strongly Agree</td>
<td>20%</td>
<td>46%</td>
</tr>
<tr>
<td>b) Agree</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>c) No Opinion</td>
<td>30%</td>
<td>4%</td>
</tr>
<tr>
<td>d) Disagree</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>e) Strongly Disagree</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>
APPENDIX E

Project Photographs
Wood Duck Nesting Boxes
Wood Duck Nesting Boxes