THE DEVELOPMENT OF AN ON-SITE OUTDOOR CLASSROOM AND A MULTIDISCIPLINARY RESOURCE CENTER TO BE USED WITH GRADES K-8 AT NATIVITY OF OUR LORD CATHOLIC SCHOOL

By

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ABSTRACT

The purpose of this project was to develop an on-site, outdoor classroom and a multidisciplinary resource center to be used in conjunction with the outdoor classroom for grades K-8 from Nativity of Our Lord Catholic School (NCS).

NCS, being a private school, is not under the state’s requirement to have an environmental education (EE) curriculum. Having an on-site, outdoor classroom with a resource center is one way for NCS to voluntarily implement EE into the school’s curriculum. NCS is also an “urban” school; the only such school in Rhinelander with a very limited, natural, outdoor area. All of the other schools in the city have an abundance of green space on their school grounds; NCS playground is 90% blacktop. For the teachers at NCS to incorporate outdoor environmental studies into their students’ learning, it requires chaperones, permission slips and transportation to take students to a location off school grounds. This makes an outdoor nature experience a rare occurrence. Research shows that having an EE program and consistent exposure to outside environmental settings increases students’ awareness, knowledge and citizen action response to environmental issues. This, then, is the main goal of the NCS outdoor classroom.

The project of the outdoor classroom expanded the green space at NCS and made the blacktop area more educational. Five committees comprised of adults and students were organized. There was a committee for each of the areas of the outdoor classroom: blacktop painting, meadow, pond/woodlot, classroom structure and finance. Numerous steps were taken to realize the development of the classroom. Approval from the Parish Council was sought, a grant was written, community members contacted for help, and an Eagle Scout project completed in order to create the emergent classroom.
As of the writing of this project the outdoor classroom has transformed the blacktop playground into an educational environment including educational paintings on the blacktop, a meadow environment, a pond/wetland environment, and a gathering place for outdoor instruction. Hopefully the best is yet to be as the outdoor classroom continues to develop over the ensuing years.
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CHAPTER I
INTRODUCTION

The Statement of the Problem

The purpose of this project is to develop an on-site outdoor classroom and a multidisciplinary resource center to be used in conjunction with grades K-8 at Nativity of Our Lord Catholic School.

The Subproblems

1. Obtain approval and support from Nativity Catholic School’s (NCS) Committee of Education for the creation of an outdoor classroom.

2. Create a committee of staff, parents, community members and students to assist in the development of the classroom.

3. Create goals to be accomplished through the outdoor classroom.

4. Create (build) the outdoor classroom with the help of volunteers and students.

5. Create a multidisciplinary resource center for the outdoor classroom.

6. Plan and implement a teacher in-service which includes: an overview of environmental education academic standards, the goals of the outdoor classroom, the physical make-up of the classroom and the contents of the resource center.

The Hypothesis

No hypotheses are needed for this project.
The Significance of the Problem

Every school district in Wisconsin must develop, implement and evaluate an environmental education curriculum in accordance with Department of Public Instruction standards. Nativity Catholic School (NCS) is located within the Rhinelander School District, but being a private, Catholic school it is required to follow diocesan standards which are developed from the state standards. Environmental education, however, is not yet included in the diocesan standards. Therefore, NCS, which is not in direct communication with the school district, does not have an environmental education curriculum. Having an on-site outdoor classroom with a resource center will be a way to implement environmental education into the school’s curriculum.

Nativity Catholic School is also an “urban” school and the only such school in Rhinelander. All the public schools in Rhinelander have an abundance of green space on their school grounds. For the teachers at NCS to incorporate outdoor education in their students’ learning, it requires leaving the school grounds which requires chaperones, permission slips and transportation. This makes the outdoor nature experience a rare occurrence. Knowing that time outdoors, especially time outdoors with a mentor, is essential to the development of sensitivity, appreciation and awareness of nature, it is important for NCS to have available, on-site green space for learning and reflection.

The Limitations

1. This outdoor classroom will not take the place of other field trips nor will it be the only place or time that environmental education is taught.
2. The classroom can be used for all K-8 grades and for all subject areas.

3. The resource center will contain only suggested activities. It does not have to be used in order to use the outdoor classroom.

**The Definition of Terms**

**Development:** To be planned, drafted, financed and constructed.

**On-site outdoor classroom:** This site consists of the school grounds at NCS. It will consist of utilizing as much of the playground/parking area as possible along with an unused garage.

**Multidisciplinary:** To be used within a range of subjects such as reading/language arts, science, social studies, math, etc.

**Resource center:** A 3-shelf metal bookcase housed within the school’s library that includes books, lesson plan guides (such as project WILD), videos and other teacher resources with an environmental emphasis.

**Environmental Education:** The study of the environment with the intention to increase environmental sensitivity, awareness, knowledge, skills, and citizen action.

**Nativity Catholic School:** Formally “Nativity of Our Lord Catholic School,” the only Catholic school in Rhinelander, WI (pop. 7800). Even though it is situated in a fairly small community, the school site is urban as there is virtually no green space.

**Students at NCS:** There are approximately 300 students in grades K-8 with 16 to 25 students per class.
Assumptions

1. Permission will be granted to build the outdoor classroom.

2. Staff and parents will be willing to help with the project.

3. Teachers will be receptive to the idea and utilize the classroom for environmental education and other classes.

4. Utilization of the classroom will accomplish the goals set for the classroom.
CHAPTER II
LITERATURE REVIEW

Rationale for Environmental Education in the Classroom.

Not only is an environmental education (EE) curriculum mandated for every school district in Wisconsin (Wisconsin Administration Code PI 8.01 (2) (k)), but there is a tremendous amount of research showing the value of having an EE curriculum in place, mandated or not. The definition of EE according to The National Project for Excellence in EE is as follows:

Environmental Education is a process that aims to develop an environmentally literate citizenry that can compete in our global economy; has the skills, knowledge, and inclination to make well-informed choices; and exercises the rights and responsibilities of members of a community (www.naee.org).

How can EE help students become adults that can compete in our global economy, make well-informed environmental choices, and become active citizens in our community?

The North American Association for Environmental Education (NAAEE) calls the workers of the 21st century “Renaissance Workers.” These are workers that compete in our global economy. They are leaders, visionaries, critical thinkers, skilled communicators, and collaborators. They are empowered, self-disciplined, and flexible. They can work independently or on teams, can make decisions, interpret data, write analytical reports, and have an understanding of the interrelationships between the economy, environment, communications, and technology (NAAEE 2001). Obviously much will be expected of future contributing members of society. The structure of EE will help children of today become the skilled workers of tomorrow. EE emphasizes “[...] multi and interdisciplinary learning, higher order thinking skills, and real world problem solving. It can help create the new generation of workers that tomorrow’s economy needs” (NAAEE 2001).
According to Dunlap, Gallup, Gallup 1993 as in Zeleny 1999, eighty-five percent of American citizens are concerned about the environment. Our schools are responsible to help students develop attitudes and values so they can, as adults, make informed decisions based on a clear value system (Holder, Owens, & Davis 1992). The primary goal of EE is to encourage pro-environmental behavior; therefore, a well-developed EE curriculum teaches students how to make well-informed environmental choices. A comprehensive EE curriculum includes activities that encourage development and awareness of values, critical thinking, knowledge of ecological concepts, environmental sensitivity and awareness, issue analysis and investigative skills, citizen action skills and citizen action experience. All of these help increase the students’ internal locus of control which enables them to act on their decisions. Enabled thus, students move from “[...] being part of the problem to becoming part of the solution in resolving ecological problems” (Holder, Owens & David, 1992).

The main goal of environmental education is to encourage and enable students to become active citizens in their communities. According to Hungerford & Volk (1990), in order for people to act on their knowledge of ecology and environmental issues they need environmental sensitivity, personal investment, knowledge of action strategies and an internal locus of control. “Students must be given the opportunity to develop a sense of ownership and empowerment so that they are fully invested in an environmental sense and are prompted to become responsible, active citizens” (Hungerford & Volk 1990). This is achieved through EE by a curriculum that encompasses the five sub-goals of EE: Awareness, Knowledge, Values (Ethics), Citizen Action Skills and Citizen Action Experiences.

Often, the bottom line as to the value of a curriculum is how much students improve academically. According to a 1998 study undertaken by the State Education and Environmental Roundtable (SEER), there is resounding proof that a well-done EE curriculum significantly increases students’ academic performance in all areas, especially in math, language arts, and social studies (Leiberman & Hoody, 1998-2002). The study included 40 schools, each with a strong EE program. All schools saw significant increases in their students’ academic test scores, GPAs, and fewer discipline problems. Much of this is to be credited to the fact that EE, infused into subject areas, makes
subjects interesting and relevant. “Its focus on the immediate environment and the local community makes learning relevant, interesting, and compelling.” (NAAEE 2001) Just like adults, when students see the importance of what they are doing and are enthused by it, their assimilation of knowledge increases. This also means their pride and ownership of accomplishments gives them the motivation to act on that knowledge. Environmental Education can help produce “[...] high-performance life-long learners, effective future workers and problem solvers, thoughtful community leaders, and participants; people who care about people, creatures and places around them” (NAAEE 2001).

Value of being Outside in Nature

Being outside in nature brings tremendous value to students’ education, appreciation of life, and environmental behavior, especially for schools in an urban setting. Outdoor nature experiences help students get in touch with their natural predisposition to be connected with nature, increases students awareness and sensitivity to nature, and is integral to environmental behavior and responsible citizenry.

Most adults remember with fondness the unstructured time spent as a child outside with nature. Historically, Man grew up outside immersed in nature (Rivkin 1997), and this is still the case in developing countries. However, with the increase in urbanization and industrialization he/she has moved further away from nature, and this affects children the most keenly. Children are multi-sensory physical beings and they need to learn first-hand about their surroundings. With the increase of these modern forces children spend less and less time in nature due to numerous factors: increase in motorized transportation, increase in hours within a school building, decrease in working with parents outside at home (i.e., farming), increase in use of childcare and organized sports, decrease in neighborhood playmates and safe environment, increase in media entertainment (Rivkin 1997). “We are ‘hard-wired’ to affiliate with natural environments, needing such affiliation in the same way we need contact with other people” (Rivkin 1997). Increasing time spent outside in a natural setting raises enjoyment and relaxation, lowers stress levels, increases health and increases satisfaction in all areas of life (Kaplan & Kaplan, 1989, as quoted in Rivkin, 1997). It is important for
schools, when and however possible, to allow children time to interact with our natural world.

The first sub-goal of environmental education is to raise students’ awareness and sensitivity towards the natural world. According to Simmon (1998), having consistent exposure to nature is an essential part of an EE curriculum. It offers students direct, purposeful experience in a diverse natural setting. In nature students are able to see that change is constant and inevitable, that natural resources are necessary for our survival, and that ecosystems have definite limitations (McKnight & McKnight 1987). Outdoor classrooms reach all students, but are especially needed for students with a naturalist intelligence (Meyer 1997). In this setting they will be observing, measuring, classifying, analyzing, and interpreting. Learning about our natural world while in nature enables students to become sensitive and aware, and appreciative of our environment.

Once students are aware of and sensitive to nature, the knowledge they receive in the classroom will achieve special meaning. “As individuals develop an emotion-connection to their local natural resources they appear to act responsibly in day-to-day activities as well as at that setting”(Vaske & Kobrin 2001). People act on issues they feel strongly about. Therefore, first-hand contact with the environment can be a catalyst for developing effective citizens (Heath & Weible, 1979-1980).

**Value and Development of an On-site Outdoor Classroom**

The value of an on-site outdoor classroom is such that it brings the benefits of being outside without the barriers of leaving the school grounds. Being on-site, teachers do not have to worry about transportation arrangements and costs, chaperones, and permission slips; therefore, teachers are able to take their students outside more often for instruction (Euler 1981). Each of these barriers can be a huge deterrent to spending the time needed outside to increase students’ awareness, sensitivity and knowledge of the environment. The barriers take time, money and energy for the teachers to overcome, all of which are in short supply for teachers. Realistically, a teacher may be able to have the finances and time to plan three to four environmental field trips; a very small portion of the entire time a student spends in the classroom. With an on-site outdoor classroom, teachers can take students out on a regular, weekly basis and according to Zelezny
"EE in nontraditional settings outside the classroom may be more effective than classroom EE in changing environmental behavior."

There are definite steps to take to ensure that an on-site outdoor classroom is successful. The most important step, determined by the number of times it is mentioned in resource articles, is to involve students in the planning, development and maintenance of the classroom (Keetch 1996, McKnight and McKnight 1987, and Rivkin 1997). Student involvement develops awareness, knowledge, and appreciation along with ownership, leadership, and stewardship. Also recommended is to gain the support of teachers, administrations, parents and community members (Euler 1981, and Keetch 1996). Other steps to a successful outdoor classroom are: drafting a definite plan, securing funding, and creating a final map of the outdoor classroom. Many specific details on how to progress with developing the outdoor classroom are given in *Greening School Grounds* (Grant and Littlejohn 2001) and on the National Wildlife Federation website for their school yard habitat programs.

One of the first and the most important decisions to be made as soon as the committee is formed to develop the outdoor classroom is to decide what the classroom will be like. Ideas for this can also be found at the above mentioned sites. Two of the most interesting ideas are roof greening and amphibian ponds. Obendorfer (2002) and Kuhn (1996) give many details on roof greening, which consists of using a flat roof at the outdoor classroom. The benefits to roof greening include, increased insulation, oxygen production and life of roof, and decreased storm water runoff. Roof greening is a unique way to find nature in an urban setting. Amphibian pond information can be found in Danks (2001) and Gosselin and Johnsons’s (1996) articles. Ponds are a wonderful way to observe the life cycles of plants and animals and increase the aesthetic value of school grounds. These are two of the many types of on-site outdoor classrooms that can be developed.

It is imperative that during the development of an outdoor classroom one keeps in mind that it will be an on-going, evolving process; one that will make committee members, students, teachers and the community stretch and grow.
Value of and Strategies for Effective Teacher In-service Education

Good teachers expand students’ limits of knowledge and understanding. Good teachers are themselves students that desire to continue learning. The effective utilization of a new, on-site outdoor classroom requires in-service training for teachers, not only for them to be comfortable with and knowledgeable about the classroom, but also for the teachers to be familiar with how to infuse Environmental Education into their curriculum with the use of the outdoor classroom. According to Euler (1981), “Most grade-level teachers need special training to work comfortably in the outdoors with students[...]”.

There have been numerous studies completed to pin-point the barriers that exist to teachers infusing EE into their curriculum with or without an outdoor classroom. The Ham and Sewing (1987-1988) study found that the main reason why teachers do not implement EE is because they are unsure of their own competency to teach EE programs; teachers feel they do not have enough knowledge about environmental education. A 1992 study by Lane et al (1994) showed “That lack of training in environmental education (EE) is a major reason teachers do not infuse these concepts.” Teachers also believe that EE is not related to their area of teaching. Since 1985, all college students in Wisconsin working toward their teacher certification have been mandated to take EE required classes (called pre-service). This has helped new teachers feel effective in teaching EE in the classroom (Lane et al, 1995); however, older teachers were not required to take such classes and instituting a new concept, such as an on-site outdoor classroom, means that all teachers will need in-servicing. According to Lane et al (1995) in-servicing does increase the amount of EE infused into the curriculum and multiple in-service opportunities are even more beneficial.

In order to have an effective in-service program one needs to look at the different types and components of productive in-servicing. One point to remember, mentioned above, is that multiple in-service opportunities will be the most beneficial.

Ritz (1977) suggests two types of in-services: one is an activity oriented workshop and the other is a seminar in environmental awareness which includes a balanced presentation of a controversial environmental topic presented by teams of teachers. This is a wonderful example of showing how environmental education works,
from awareness right on to citizen action. However, most schools do not have the weeks, hours, and days to complete such extensive in-servicing.

Some pre-formatted workshops such as Project WILD, Aquatic WILD, Project Learning Tree and LEAF are wonderful at exposing teachers to multiple hands-on activities. These are often easy to infuse into curriculum in all disciplines and all ages.

For the in-service that is going to be conducted by a fellow educator, in a short period of time (a couple of hours), there are some important strategies to know in order to have the most effective in-service possible (Ham & Sewing, 1987-1988, Lane et al, 1994 and Wade, 1996).

1. Make sure the in-service is geared for all teachers; EE is not just for science or science teachers. The beauty of it is that EE infuses so well into every subject area.
2. In-service should focus on EE methods.
3. Encourage EE in the classroom and in the schoolyard.
4. Explore the instructional materials that are available.
5. Ideas should be practical.
6. Offer follow-up support.
7. Be motivational and understanding.

In-servicing is important to increasing the amount of EE brought into the curriculum; the more in-servicing the better. This is especially true when new EE components are added to the school, such as an outdoor classroom.

Resource Center for Environmental/Outdoor Classroom Use

As in any field, teachers use guides, texts, and resources which offer ideas on what to teach and how to teach it. In a new situation, such as an outdoor classroom, teachers appreciate having new ideas to start out with (Lane et al 1994). When the outdoor site is to be used for Environmental Education, a curriculum that many teachers are new to, again, guides with activities are very helpful. A resource center stocked with activity guides, videos and other resources that are up-to-date and user friendly is
invaluable to helping teachers infuse EE into their curriculum and utilize green space around the school.

Many studies show that not having EE resources readily available is a major barrier to the implementation of environmental education. In a study completed by D. Haury one of the most frequently asked question by teachers was where they could find hands-on resources (Haury, D. 1994). In the Lane et al study (1994) the second most common response to what would help teachers teach EE was the need for “…better access to resources.” (Lane et al, 1994). Also in the Sewing (1996) study over 60% of the responding teachers felt that the lack of EE materials was a barrier to teaching EE (Ham et al, 1987-1988). “Almost three-fourths of the respondents placed lack of instructional materials in either the ‘most important’ or ‘important’ barrier groups.” (Ham & Sewing, 1987-1988).

With this obvious need for EE instructional materials available to teachers, it is important to address this issue. One way to address it is with a resource center of EE materials located in a central location for all teachers to utilize. Some guidelines for a resource center are:

- easy to use
- central location
- includes a variety of types of resources (multi-media)
- includes a wide range of environmental issues
- information is pertinent to all subject areas (not just science) and all grades
- includes activity and informational guides
- includes a listing of all resources available for each teacher to peruse at their leisure.

With an EE resource center in place, teachers are much better equipped to infuse EE into their curriculum.
Subproblem One: Obtain approval and support from Nativity Catholic School's (NCS) Committee of Education for the creation of an outdoor classroom.

It’s always important to go through the correct channels when trying to obtain approval for a new project. School boards and governing committees are put into place so that things are done in an orderly fashion and to prevent chaos.

The first step to obtain approval was to gather data to show that an outdoor classroom would be an asset to the school. Information was gathered by researching published articles regarding the merits of an outdoor classroom. Data was also gathered by surveying faculty as to their interest in using an outdoor classroom for their existing curriculum and their interest in using it for environmental education activities. Students were also surveyed in regards to their interest in increased outdoor learning. And finally, parents were asked to complete a survey to determine their perceptions of the need for and the usefulness of an outdoor classroom. (See surveys, appendix A, pgs 1-5)

The next step was to develop a presentation (Appendix A, pgs 6-9), including the above-mentioned data and background on the benefits of an outdoor classroom. The information was presented to the Committee of Education in January 2004. Financial information was not included at this time as only permission to form a committee to look into the possibility of creating an outdoor classroom was sought. As the outdoor
classroom committee came up with proposals for the outdoor classroom, members of the committee sought approval from the Committee of Education. This occurred on numerous occasions from June 2004 to September 2005. For some of the more major projects such as requesting use of a garage and the creation of a pond, members also had to request permission of the Parish Council as the proposal affected more than just the school.

Subproblem Two: Create a committee of faculty, parents, community members, and students to assist with the development plan for the outdoor classroom.

Developing a committee helps to transfer an idea from one person to a group of persons; it creates ownership for a large number of people. In a school situation, it is especially important for students to feel ownership and pride in their school. And, if students and adults work together as equals to accomplish a project, there is an incremental benefit to the school community. One of the goals for the committee was that it would be made up equally of students and adults.

The first step in creating a committee was to request volunteers from staff, parents, community members and students.

For the parents: those asked were selected based on the interest they expressed in completing the initial survey and personal recommendations. Parents were asked to participate via a letter (Appendix A, pg. 10) that included a reply section that they returned if they were interested.
For the faculty: information regarding the approval to form an outdoor classroom was presented at a faculty meeting via a memo (Appendix A, pg 11). At this time faculty were encouraged by the author to join the committee to help plan and develop the outdoor classroom.

For the students: all students were presented with the opportunity to fill out an idea sheet (Appendix A, pg 12). Two students from each class in grades 3-8 were selected from their responses on the idea sheet.

For the community members: one community member was specifically sought out, the youth development specialist at the Oneida County UW-Extension, Jim Winkler. He was contacted through a phone call.

The committee met several times to establish the following in the specified order:

1. Completed a SWOT (Strengths, Weaknesses, Opportunities, Threats) for the outdoor school site (Appendix A, pg 13).

2. Brainstormed ideas on what they would like to see developed for the outdoor classroom and ranked the ideas in order of interest and feasibility (Appendix A, pgs 14 & 15).

3. Assessed the site during a tour of the area.

4. Divided into sub-committees based on member’s interest. Four sub-committees were created at this time, one for each area of the outdoor classroom (Appendix A, pg 16). A fifth committee, finance, was added later on.
5. Drafted a structural plan for each area of the outdoor classroom, including a list of what needed to be done by specialists, what needed to be done by adults, and what could be done by students.

6. Created a budget and identified possible alternative financing for example, donations and grants. (At this point the sub-committee members went back to the Committee of Education and Parish Council for full approval).

7. Created a timeline for completion of the project.

Subproblem Three: Create goals to be accomplished through the outdoor classroom.

The creation of goals for a project is of ultimate importance because it gives direction and meaning for the committee working on completing the project. For the outdoor classroom committee, the creation of the goals served as a compass to help members stay on the right path with their ideas.

The goals were based on the premise (obtained through the literature review) that an outdoor classroom will increase students’ awareness of nature and the environment. With this as a basis, the questions on the initial surveys were created. The goals of the outdoor classroom were determined from the questions on the surveys which received the greatest number of positive responses. (Appendix A, pgs. 17-19).
Subproblem Four: Create (build) the outdoor classroom with the help of volunteers and students.

Similar to the ownership obtained when students and adults work together on a committee, the hands-on work of physically creating something brings even more pride, ownership and sense of satisfaction.

Building the outdoor classroom involved many steps. Some of the work was done by parent volunteers who had equipment for a specific job, such as blacktop removal. Some of the work was done by community members. Gardening advice was provided by master gardeners and blacktop cutting was done by a local business. As much as possible was done by students during the school day: shoveling soil, painting on the blacktop. The remaining work was done by special crews on weekends. The crews consisted of committee members, additional volunteers, and Boy Scouts.

The sub-committees continued to play an integral part in building the outdoor classroom and met as necessary to complete portions of the project. They were the ones responsible for making contacts, obtaining supplies and maintaining the momentum of the project.

Subproblem Five: Create a resource center for the outdoor classroom.

Teachers are constantly looking for new and innovative ways to teach and resources to help them do so; however, their time is limited and precious. For many teachers, incorporating environmental education is a struggle because of the time it takes to locate resources and the unfamiliarity with the resources available. In new teaching
situations, it is best to have information readily and easily available for teachers to use. Having an outdoor classroom resource center available in the school library (IMC) that includes activity guides, informational books, supplemental story books, videos, filmstrips and teacher suggested activities will help teachers teach environmental education and utilize the outdoor classroom.

Steps used to create a bookshelf of multiple environmental education resources:

1. Teachers were asked to submit two lesson plans, their own or plans from a published text that could easily be used with the outdoor classroom. These were organized with a table of contents, put into a three-ring binder and included on the bookshelf.

2. Activity guides, video tapes, filmstrips, and books (informational and story) that have an environmental emphasis were collected and catalogued.

3. A list of the resources on the bookshelf was generated. This, and the items on the bookshelf, was organized by subject area. This list was given to every teacher and one was laminated and attached to the bookshelf.

Subproblem Six: Plan and implement a teacher in-service.

The effective utilization of a new on-site outdoor classroom and the implementation of environmental education requires in-service training for teachers. Without this training, teachers will be unfamiliar with environmental education standards.
(especially older teachers), the outdoor classroom site, and the resource materials available to help them incorporate EE standards and utilize the outdoor classroom.

Two in-services were presented to teachers, one in the fall of 2004 and one in the winter of 2006.

In-service August 2004:

1. Teachers were taken outside and as they walked around, the plans for the future outdoor classroom were explained. This was conducted by several students that were on the outdoor classroom committee.

2. Teachers were encouraged to have their classes participate when various projects got under way. They would be informed as to when and what the projects were.

In-service February 2006:

1. An overview of Environmental Education was provided including the rationale for EE and information on Wisconsin’s EE standards.

2. The value and goals of an outdoor classroom with regard to providing environmental education was also presented.

3. A brief power-point of the outdoor classroom as it looked in the fall was viewed along with an overview of the future vision for the classroom.
4. Hand-outs on how to conduct outdoor classes were given and briefly reviewed.

5. A tour of the resource center was given and hand-outs including the list of resources available and the table of contents from the lesson plans submitted by the teachers were presented to each teacher.

6. Teachers were asked for their cooperation in completing another survey in the spring (end of May) to determine how successful the outdoor classroom had been in achieving its goals.

Other teacher training:

1. In October 2004, the author arranged for the all-school in-service to be a Project WILD workshop. This workshop was held at Treehaven in Tomahawk.

2. In March 2005, a LEAF workshop was organized between NCS and the Rhinelander School District.
CHAPTER IV

RESULTS.

Subproblem One: Obtain approval and support from Nativity Catholic School's (NCS) Committee of Education for the creation of an outdoor classroom.

In January of 2004 the proposal for creating an outdoor classroom was presented to the Committee of Education. The Committee of Education includes the principal of Nativity School, the pastor of Nativity Parish, and eight elected board members, most of them parents of NCS students. The presentation of information on Environmental Education, Outdoor Classrooms and survey results (Appendix A, pgs 1-5) was well received with very few questions. The committee was assured that the outdoor classroom would be financially self-sufficient by fund-raisers, donations and/or grants. The committee was also guaranteed that at this point approval was only being sought to form a committee to look into creating an outdoor classroom. The plans to actually proceed with the construction of the classroom would be brought back to the committee for approval as they were created.

After questions and discussion, the Committee of Education voted unanimously to approve the author proceeding with the formation of an outdoor classroom committee.
Subproblem Two: Create a committee of faculty, parents, community members, and students to assist with the development plan for the classroom.

A list of potential committee members was garnered from the initial survey completed by staff, parents and students. One of the last items on each survey asked if they would be interested in helping out with creating an outdoor classroom. The response to that question on the survey was 77% (7/9) of staff, 42% (37/51) of parents, and 65% (85/130) of students indicated they would like to help out. The parents, staff and students that responded positively were contacted a second time to determine if they were interested in being on a planning committee or helping out with construction. Parents were contacted through means of a letter (Appendix A, pg 10), staff by means of a memo (Appendix A, pg 11) and students through means of a questionnaire (Appendix A, pg 12). After the second inquiry, 100% (3/3) of the staff, 30% (11/37) of the parents and 26% (22/85) of the students that indicated that they would be interested in helping out stated they were interested in being on a planning committee. These people were invited to an initial planning meeting (Appendix A, pgs 20 & 21) in March 2004. Of those invited 67% (2/3) of the staff, 81% (9/11) of the parents, and 45% (10/22) of the students that said they were interested actually attended the initial planning meeting; these people became the members of the outdoor classroom committee.

At this time, Jim Winkler, youth development specialist at the Oneida County UW-Extension, was contacted to inquire whether he would be interested in being facilitator for the committee. Jim was very open to the idea and had some wonderful suggestions on how to approach the first few meetings. Jim agreed to commit to being facilitator and because half of the committee members were students this activity fell
within his job description of empowering youth; therefore, there was no charge for his services.

The committee met several times and established the following in the specified order:

1. Completed a SWOT assessment. Results: Even though there were obvious weaknesses and threats to creating an outdoor classroom, the committee felt the strengths and opportunities outweighed them (Appendix A, pg 13). This exercise helped the committee enter into the process of creating an outdoor classroom aware of all of the possibilities, good and bad.

2. Brainstorm ideas. Results: The committee generated a list of 54 ideas for the outdoor classroom using the TOP workshop method. These ideas were categorized and narrowed down to a list of ten using ANGT voting. The ten were looked at more closely and they were grouped into three main ideas: garden/greenhouse, pond/wetland, and a classroom structure. A fourth, blacktop painting, was added in order to utilize our biggest space, the blacktop.

3. Site tour. Results: After touring the grounds, the committee members decided that the garden area could be put in an area between the school and convent where some blacktop could be removed and the greenhouse could be attached to an unused unattached garage. They also decided that the pond/wetland could be created in the convent yard after it was expanded. An unused unattached garage was looked at and appeared to be an ideal place for the classroom structure (meeting/discussion area).
4. Committee members decided which of the four sub-committees they wanted to work on. Results: After the tour, the members broke off into groups according to which area they would like to plan for. Three adults and eight students chose the greenhouse/gardening group, four adults and two students chose the classroom structure group, three adults and one student chose the wetland/pond group and three adults chose the blacktop painting group. These groups did change somewhat as time went on; a few people dropped out of the process all together and a couple of people switched groups.

5. (also includes #6 and #7 from methods) Each sub-committee drafted a structural plan and a list of what needed to be done and by whom. Results: At this point each group started meeting separately on their own time frame. The author attended each group’s meeting. Each group hashed out what they would like to see created in their area, how it could possibly be financed and what the time frame would be for getting it accomplished. Each group also completed a proposal sheet (Appendix A, pgs 22-24) for their presentation to the Committee of Education and the Parish Council. A member of each sub-committee, in one case a student, presented to the Committee of Education and the Parish Council when their plan was complete.

Subproblem Three: Create goals to be accomplished through the outdoor classroom.

The goals that were created for the outdoor classroom were directly tied to the surveys completed by staff, parents and students. The surveys were created on the
premise that the *overriding goals* for the outdoor classroom should be that **the amount of environmental education taught at Nativity School needed to be increased** and that it was **important to increase the students’ awareness of nature by creating more green space on the school’s grounds**. The premise was supported by the following survey results (Appendix A, pgs 17-19):

- “I am aware that WDPI has created a set of standards addressing environmental education.” – 56% agreed.
- “On average, I incorporate environmental topics in my instruction at least once per month.” - 67% agreed.
- “I believe I would teach more environmental education if we had an outdoor classroom.” – 78% agreed.
- “I think learning about nature is an important part of a student’s formal education.” (parents’ survey) – 97% agreed.
- “I think it’s important to learn about nature by being outside.” (students’ survey) – 99% agreed.

The goals for the outdoor classroom were created from the following results of the survey.

**Goal #1. To be an outside area that can easily be used by teachers for classes.**
- “I would take my classes outside for instruction more often if the school site was more user friendly.” – 89% agreed.
- “If an outdoor classroom were created, including a woodland area and educational stencils on the pavement, I would use it as a teaching resource.” – 78% agreed.
Goal #2. To be an area that will allow hands-on, real-life learning experiences.

- “I think students learn better through hands-on, real-life experiences.”
  (parent survey) – 100% agreed.
- “I think students learn better through hands-on, real-life experiences.”
  (faculty survey) – 100% agreed.

Goal #3. To be an area that will increase wildlife habitat. This was the authors addition, but it falls under “real-life experiences”.

Subproblem Four: Create (build) the outdoor classroom with the help of volunteers and students.

The outdoor classroom consisted of one main committee divided into four sub-committees for the four areas of the outdoor classroom. The four sub-committees included the greenhouse/garden, the pond/wetland, the blacktop painting and the classroom structure. Each committee worked fairly independently beginning in May 2004, although they did come together to share ideas and to work on the projects. As of March 2006, these are the results of each committee’s work (see Appendix B for photos):

**Greenhouse/garden:** This committee actually changed to the meadow committee as the process went along. (The greenhouse/gardening idea was incorporated into the design of the classroom structure because it was felt there was minimum gardening that could be done outside of a greenhouse during the school year due to the school’s location in northern Wisconsin.) This committee’s core members were two adults and five students. They really wanted to see something happen, so everything progressed quickly. An area
of approximately 300 square feet of blacktop between the school and the convent was torn up in the September of 2004. This was completed with the donation of services from a local business and a school parent. Topsoil for the area was then donated from a local business, the county landfill and a school family. The school children had the chance to watch the blacktop being removed and all of the classes helped in leveling out the soil. In the spring of 2005, two master gardeners were consulted on how to proceed with the meadow. The advice from the master gardeners was to spread out the wildflower seed (donated), cover it with straw to prevent birds from eating the seeds, and cover that with roadside netting to prevent the straw from blowing around. The meadow was also planned out with the help of the master gardeners and it included pathways, grass areas, a planted perennial area and a wildflower area. The seeds were put down at the end of the school year 2004 and donated perennials were also planted at this time. During the summer, numerous committee members helped weed the meadow and a low-cost automatic watering system was added. In the fall of 2005, the perennials were mulched around by the students and the pathways were firmly established also by the students. It was definitely a green area, but at this point had more weeds than flowers. Throughout the course of the summer, there had been rabbits, squirrels and birds visiting the meadow.

**Pond/wetland:** The pond/wetland committee, which eventually consisted of two adults and two students, decided to concentrate on the construction of a pond in the convent yard with the financial aide of a grant. The committee obtained approval from the Parish Council to go ahead with their plans in September of 2004. A WEEB grant (Appendix C) was submitted in January 2005. This grant was not approved. The pond committee decided to go ahead with increasing the size of the yard anyway in hopes that another
grant would be written or financial assistance would come from another source. This yard area which was basically a triangular area about 290 square feet was increased in size to 435 square feet by the removal of some blacktop. The blacktop was removed through the donation of services from a local business and a parent in May 2005. Topsoil was donated by the county landfill for the new area. A new twist in the plans for the pond at this time was the very real possibility that the school/church would be building a new facility at a new location in the next three to five years. Questions were raised as to how much effort should be put into creating a pond at this present site. The pond area was put on hold until February of 2006 when it was decided by the school’s Trash & Treasures Committee that the annual school’s Trash & Treasure rummage sale’s proceeds would go to the outdoor classroom. The Outdoor Classroom Committee decided at this time to proceed with the creation of the pond in the spring of 2006 using the proceeds of the rummage sale. One of the student pond committee members sought approval to use this project as his Eagle Scout project for Boy Scouts. The Eagle Scout project included the creation of a pond with a flexible liner that has a waterfall on one end so it will (hopefully) not freeze in the winter. It also included natural landscaping around the pond and a split-rail fence on one end of the pond area.

**Blacktop Painting:** The blacktop painting committee was the first committee to receive approval from the Committee of Education, July 2004. This was also the least intrusive of all the area plans. It was decided by this committee to have the students paint educational designs on the blacktop. Each class was encouraged to participate. The eighth grade science class conducted an experiment of different kinds of paints to see which would hold up the best on the playground. They discovered that latex indoor paint held up as
well as the others and would be easier to obtain through donations. An announcement went out in the school newsletter and the church bulletin asking for any latex paint people were willing to donate; about 10 gallons and quarts were donated. In the spring of 2005 the third grade painted large, empty picture frames that could be drawn in with chalk. The fifth grade painted a huge, to-scale solar system. The seventh grade class painted three large grids which could be used with chalk. The eighth grade painted the Periodic Table of Elements on the side of the convent. In the fall of 2005 the new eighth grade painted a map of the United States using a stencil purchased by the school. This map measures 20’ by 30’. In spring 2006, plans are to add a map of the world (also using a stencil), paint a number snake, and paint the mission statement in the center of the playground, “Come enjoy, explore and learn about God’s creation”.

**Classroom Structure:** The classroom structure committee consisted of two students and three adults, one of whom is an architect. The decision from the committee was to seek approval to use a garage that was currently used for storage as the outdoor classroom structure. Detailed plans were drawn up by the architect on the committee as to what our “dream” structure would be. The plans included solar lighting, new doors, new windows, insulation, drywall, an attached greenhouse and more (see plans in appendix B). The committee sought approval from the Committee of Education and the Parish Council in September. They received approval to go ahead, but were told to check back with the Parish Council before they did any major modifications, such as adding the greenhouse. In the summer of 2005 the garage was cleaned out and the inside was partially painted. A decision was also made as to the types of benches that would be the most versatile for the classroom. A prototype was created of the benches and a poster along with the bench was
placed outside of church on Sundays requesting donations toward the purchase of five more benches at $60 a piece. The money for four more benches was donated within the following few weeks. In the fall of 2005, students continued to paint the inside of the garage. When the painting was complete, the garage was totally emptied, organized and set up as a classroom. All of the teachers received a key to the garage in late October and were told that the garage/outdoor classroom was ready to be used. At this point none of the major improvements to the classroom structure had been made due to the probability of relocating the school in the near future. Unlike the pond which could be dismantled and moved to a new location, the garage was in too poor of shape to be feasibly moved; any money invested in it would be lost. The plan now is to incorporate an outdoor classroom structure into the new facility. The present structure is useful as it is, not perfect, but useable.

**New names:** At the end of the 2006 school year a contest was created to help with the naming of the different areas of the outdoor classroom. All students were invited to submitte names and the students on the outdoor classroom committee narrowed the list down. After this, the students on said committee voted as did the staff. The following names were the winners: “The Clubhouse” for the garage, “Grace Garden” for the meadow, “St. Francis Garden” for the pond area and “The Pond of Silent Prayers” for the pond. Signs for these areas will be made before the fall 2006 open house.

**Finance:** In March 2005 the finance sub-committee was created. Four adults were personally asked to be a part of the committee, three agreed. The goal of the finance committee was to come up with some on-going means for the outdoor classroom to create revenue without encroaching on the school and church’s fundraising. The committee
knew that donations and grant writing would continue to be pursued, but they wanted some other lower maintenance ideas. The committee came up with two ideas, aluminum can and printer cartridge collection and recycling. The Can Do! (aluminum can) project involved contacting businesses that would be willing to save their aluminum cans for the outdoor classroom (Appendix A, pg 25 & 26), contracting a price from the aluminum recycling business and setting up a schedule for can collection. The committee began the Can Do! project in June with about six businesses on board. $208 was generated from June through August 2005. In May 2005 the printer cartridge recycling was started. A company had contacted the school the previous fall to see if the school wanted to earn money by recycling cartridges. This information was saved and the company was contacted at this time. Flyers went out to families, an announcement was put into the parish bulletin, and boxes were set out for collection. From June 2005 to February 2006, $300 was generated through the cartridge recycling. The finance committee met again in February 2006. It was decided at this meeting to contact businesses in town to save their cartridges for the outdoor classroom. This was done through personal contact. It was also decided to not continue with the Can Do! project due to the amount of work and decreased business involvement except to put up an enclosure at the school for people to drop off cans. At this time it was also decided that the sale of Smencils, scented pencils made from recycled newspaper, should be included as a fundraiser. One of the most exciting aspects of all of these continual money raisers is that they all involve recycling which is so positive for an environmental classroom. The committee also created a request for funds form to be used by other committee members when requesting money
for projects (Appendix A, pg 27). The money for the outdoor classroom is kept with the parish finances; a ledger of the account is kept by the author.

**Subproblem Five: Create a resource center for the outdoor classroom.**

A resource center was created in order to help teachers utilize the outdoor classroom. A metal three-shelf bookshelf was donated to the school and set-up in the library for the outdoor classroom in January 2005. At this time a few books that came into the author’s possession through workshops, etc. were catalogued and placed on the shelves. The 3-ring notebooks of each sub-committee were also stored on the bookshelf.

In November of 2005, the teaching staff was asked to submit two lesson plans that would be easy to use outside in the outdoor classroom (Appendix D). Twenty-eight lesson plans were received from the teaching staff. Of these, twenty-one were created by the teacher or from the teacher’s textbook, five were from Project WILD and two were from LEAF. (Appendix D)

In January 2006, books, manuals, videos, and filmstrips having to do with environmental education that had been stored in the science lab were moved to the bookshelf in the library. In February they were organized by subject and catalogued. Of these resources there were: fourteen informational books, four story books, six activity books, nine lesson plan books, eighteen audio-visuals, and seven miscellaneous items. The subjects covered in the materials are ecology, renewable energy, forestry, environmental issues (air/water pollution, solid waste/recycling, endangered animals, and global warming) and miscellaneous. Many of the items were old, but did not appear to be too outdated.
Subproblem Six: Plan and implement a teacher in-service.

In-service August 2004 results: After the in-service, the teachers were familiar with the plans for the outdoor classroom and were willing to help when asked. All of the classes participated in raking out the topsoil when it was delivered to the meadow and most of the classes contributed to the blacktop painting. Classes were not held outside often, but there appeared to be an increase in outdoor activities.

In-service February 2006 results: The teachers were very open and attentive to the presentation on environmental education and the outdoor classroom (Appendix E). The teachers received a copy of the PowerPoint presentation and a packet of information including the environmental education standards, tips on taking children outside, and a copy of the resources located on the outdoor classroom resource center.

Project WILD and LEAF: All, except two, teachers attended the Project WILD in-service. The response to the workshop was very positive and teachers still refer to the ideas found in Project WILD. About 30 teachers (NCS and Rhinelander School District) attended the LEAF class, approximately 15 from NCS. Each grade level of NCS was represented at the workshop and received the materials for LEAF. Several teachers have incorporated LEAF into their curriculums.
Timeline

2003

June  
Developed project plan. First draft of chapters 1,2, & 3 completed.

August  
Approval granted from principal to survey parents and staff on need for outdoor classroom.

November  
Surveys and cover letter created.

December  
Surveys mailed out, returned and tabulated.

2004

January  
Presented survey results to NCS Committee of Education and requested permission to form a committee to investigate the practicality of creating an outdoor classroom at NCS. Permission granted with the assurance it will be self-supporting. Letterhead created. Letters sent out to recruit adult committee members.

February  
Students in grades 3-8 recruited to be committee members. Contacted Jim Winkler, 4-H Development Agent, requesting facilitator services.

March  
First committee meeting: Jim Winkler facilitated. Committee went through SWOT (Strengths, Weaknesses, Opportunities, and Threats) for creating an outdoor classroom. Goals for outdoor classroom created. Second meeting: brainstormed ideas for outdoor classroom. Narrowed top choices to four.
<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>Committee met and assessed outdoor site. Member divided into four sub-committees: greenhouse/garden, pond, blacktop painting, and garage/classroom structure.</td>
</tr>
<tr>
<td>May</td>
<td>Sub-committees met. Brainstormed possibilities and created surveys.</td>
</tr>
<tr>
<td>Summer</td>
<td>Sub-committees met individually to work out details of proposed changes. Blacktop painting sub-committee presented to the Committee of Education and received approval to paint educational designs on school parking lot/playground.</td>
</tr>
<tr>
<td>August</td>
<td>Meadow sub-committee presented to the Committee of Education and the Parish Council requesting the removal of some of the parking lot blacktop in order to create a meadow. Some concerns were raised. Approval granted. Presented development of outdoor classroom to teaching staff during in-service at the beginning of the school year.</td>
</tr>
<tr>
<td>September</td>
<td>Pond and garage/classroom sub-committees presented to the Committee of Education and the Parish council. Use of garage for outdoor classroom use approved, pursuing pond with the writing of a grant approved. Blacktop removed for meadow. Progress reported on local TV station and in Daily Newspaper. Students on committee presented progress to student body.</td>
</tr>
<tr>
<td>October</td>
<td>Topsoil delivered to meadow. All classes involved in raking soil level. Teachers in-serviced on Project WILD at Treehaven.</td>
</tr>
<tr>
<td>November</td>
<td>Pizza party for committee for a job well done.</td>
</tr>
</tbody>
</table>
January  WEEB grant for creation of pond and alternative energy aeration submitted. (not-granted). Compost started with the help of Bart Sexton from the Oneida County Landfill. Metal bookshelf set up in school library for outdoor classroom resource center. Books and supplies added to it.

March  Sub-committees met to look at goals for the year. Finance sub-committee created. Outdoor classroom created through donations of time and talent, donated items (ex: paint), and money through recycling aluminum cans and printer cartridges. Meadow sub-committee requested help from local Master Gardeners on planting of meadow. Teachers attended LEAF class.

May  Meadow sub-committee met with two master gardeners. More topsoil added to meadow area. Triangular area of blacktop by pond area removed to increase green space. Educational painting on blacktop completed by students; each grade painted a design (ex. solar system). Students on committee gave student body a walking tour of the outdoor classroom.

Summer  Meadow planted with some wildflower seeds and some donated perennials. Garage cleaned out and started painting inside. Received donated benches for garage/classroom. Meadow weeded (many weeds from donated manure/topsoil). Compost fencing completed.

September  Outdoor classroom elective created for the school year, two students from each class in grades 3-8 participate. Weeding, planting, mulching and painting completed by students.

October  Flyers sent out to all school families and staff in attempt to recruit new committee members. Poor response at meeting; two new members and
only 10 out of 20 committee members present. At meeting those present
decided what needed to be accomplished before winter. Letter sent out to
all committee members to see if they still wanted to be involved. Outdoor
classroom class finished painting garage. Garage cleaned out and all set up
for classes to utilize.

November Two outdoor multi-disciplinary lesson plans requested from each teacher
in order to include them in the resource center.

2006

January Lesson plans submitted by teachers were organized and typed. Table of
contents for the lessons was completed and included categories of which
subject each was appropriate for and what area of the outdoor classroom
each would work best in.

February Meeting of outdoor classroom committee heads to discuss plans for spring
and summer. In-service held for teachers.

April Re-painting of blacktop started (many design worn from winter plowing),
meadow raked, rotatilled, and re-seeded. Trash & Treasure sale held;
money raised for pond. Committee met to plan work day for pond. Also,
made plans for an open house, “Nativity Goes Natural”, in the fall.

May Pond is installed with the help of the pond committee and Boy Scout
Troop 660.
June

The outdoor classroom areas are named by students and staff. Work continues in weeding meadow, painting blacktop, and landscaping pond area.
CHAPTER V

CONCLUSIONS, IMPLICATIONS, and RECOMMENDATIONS

There are many lessons learned when tackling a multi-step project that involves many people. This was very true of my project. The most valuable lesson I learned was that in the process of proceeding remain flexible and hopeful, but don’t become too attached to the outcome. I came to this realization very early on in my project when I was reading *Natural Learning* by R. Moore & H. Wong for my literature review. In this book that describes a tremendous school yard renovation project that took place over an extended number of years, I learned a few things; one was that it’s okay to proceed even if you don’t know exactly what you are doing, the second was that things take time, and the third, and most important, was to not get attached to what has been created. In the epilogue of this book that tracks a school’s adventure from a schoolyard of blacktop to a schoolyard that was a model for outdoor classrooms it states, “Visitors to Washington School today will not find the Environmental Yard described in *Natural Learning*. When the school was renovated in 1995-96 to meet new earthquake standards, the community play area, Orchard Wayside, stage, outdoor storage, Kids HQ, and more than thirty shade trees were removed and replaced with a rectangle of grass and baseball courts. Although neighborhood residents protested energetically, they were not strong enough to counter the will of the school district.
As sad as this is, it is reality; what we create is not permanent. This is not meant to sound pessimistic, only realistic. Interestingly enough, shortly after I began my project, when I was gathering my information to present the outdoor classroom idea to the Committee of Education, it was announced that the parishes that fund the school would be combining and the building of a new church and school at a new site was a very real possibility in the near future. So, at every step of approval the question was asked, “What if the school is moved in a couple of years?” Thanks to Natural Learning, I was comfortable answering, “This will be a great learning process, and what we learn here we can take with us to a new school and do an even better job.” As I approach completion of my project write-up, but not the end of my project, this continues to be my answer. This has been an invaluable learning experience.

The above has been the overriding lesson for this project, but there have also been smaller, more specific lessons learned that lend themselves to implications and recommendations.

Obtaining approval and setting up committees: Everything proceeded very well in seeking approval for this project, but I did learn that you can’t be too prepared. The more I anticipated what would be a concern for the approval committee, the more sure I was of myself and the more accepting the committee was of my proposal. I would recommend that one really does their homework at this stage as it makes the following stages proceed more smoothly.
The committees were probably one of the most frustrating parts of the project. You can’t control other people, and sometimes that is very hard to accept. There was tremendous interest in the initial, planning meetings for the outdoor classroom, from adults, teachers and students. However, as the meetings started consisting of hammering out the details, the majority of the work fell onto a few people. Some suggestions: students need to be involved, but remember very few students have the skills of leadership, it takes time for them to learn, don’t expect too much, too soon. Adults want to be involved, but few truly have the time, be accepting with what they are able to offer. The best thing I did after I was a year into the project was ask another adult committee member to be co-leader with me. Emotionally and physically this was a great help. The last suggestion is: don’t quit looking for committee members, members come and go as time goes on and that’s okay.

Blacktop: The blacktop area was the easiest to change and it is the area that needs the most maintenance. Even though we knew we were taking the risk of having to repaint by not using blacktop paint (and we do after a winter of snowplowing), it was changed the quickest into an educational environment. It might be worth the time to apply for a grant in order to purchase more durable paint and painting stencils. This was one area that worked wonderfully in involving all of the school students.

Meadow: The meadow area continues to be a great learning experience. One suggestion is to have committee member(s) that actually have some knowledge about gardening! Even though we asked the advice of two Master
Gardeners, there were still many things we did wrong the first year. Here are a few of the things we learned. Try not to use anything but sterilized topsoil, there will be significantly fewer weeds to deal with. Do not use netting to hold down straw after seeding. We had several rabbits get caught in the netting and die, not a good way to start out a natural habitat area. The netting also made it very hard to pull weeds. If you want to ask for donations of perennials, then don’t expect the meadow to be native. We decided having any flowers bloom was more important than having the meadow be native, especially in light of the fact that the school will probably only be at its present location for a few more years. We decided we can take our time and plant native areas at the school’s new location. The meadow is green; however, and is already a haven for wildlife, even if it is not perfect.

Pond: The creation of the pond has and will continue to be the greatest learning experience. Even though the committee talked to a garden center about pond installation ahead of time and purchased a pond kit, it was still a bit tricky. It was wonderful having the Boy Scout Troop actually install the pond, but it took two weeks afterwards for the committee members to figure out where all of the leaks behind the waterfall were. As the water ran down the waterfall, it would go behind the rocks and soak into the ground. The committee knew this was happening because the water level kept dropping, but pinpointing the exact location was a problem. Landscaping the pond is another issue. Ponds look great when they look natural and they need plants in order to do that; this takes time. We have had many generous donations of perennial
plants for the pond area. It will look more natural after it’s been in a year. We’re also going to try to keep the pond running all winter, since that’s when the students are in school. This may require a small heater. We’ll need to keep an eye on it to make sure it doesn’t freeze up. Hopefully the pond area will become a hub of natural activity for both students and animals. The committee believes that there is a tremendous amount of awareness and learning that can take place with the addition of the pond.

Garage: The garage had the loftiest plans for change, mostly due to the fact that the key committee member is an architect, one that specializes in “green” building. The main learning experience here was to learn to scale back and work in phases. Lack of money and the possibility of moving to a new location caused us to hold back on major renovation here, but we didn’t throw the design away. We knew we could have applied for a grant, but felt it was best to wait, again, for the new location. The benefit in completing what we could with as little money as possible resulted in a comfortable, usable classroom. Donations worked very well in completing this aspect of the project, from the donated benches to the salvaged white-board from the public school auction. I would recommend, as with all the outdoor classroom areas, to do what you can with what you have and be open to new possibilities.

Finance: Our finance team chose not to pursue grants in favor of setting up on-going fundraisers. The best part is that all of the fundraisers are helping the environment – can collection, cartridge/toner collection and recycled newspaper pencils. The one area I would recommend changing is involving
more people or making sure that delegation of jobs occurs. Even though I have tried to have others help in the different aspects of finances, I am still the main person to take care of all of these fundraisers. This is my fault as I have not really handed it over to someone else. This should have been set up initially when the finance committee was set up. One of the benefits of choosing to do ongoing fundraisers is that the economic security of the outdoor classroom is more secure and we still have the option of pursuing grants for the bigger projects.

In-services: In general, all of the in-services held were well planned and well received. I believe the teachers are more aware of environmental education and the benefits of the outdoor classroom than they were before the in-services; however, I do not see the outdoor areas being utilized extensively. I think this can be attributed to three things lacking in the in-services: time, methods, and follow-up in-services. For both of the in-services I facilitated for teachers about the outdoor classroom, time was a major issue. Realistically, in order for the teachers to really understand how to implement using the outdoor classroom the in-service should have been at least half a day, yet they were each an hour or less. Because of the time constraints, I was able to talk to the teachers, but they were not able to go out to the classroom nor try any lessons. I believe this would have been extremely advantageous to increasing the use of the outdoor classroom. Also, with a greater amount of time for the in-service, I would have been able to cover more of the methods used to teach environmental education, which would have also been beneficial to the
teachers and their use of the outdoor areas. There will continue to be a need for in-servicing teachers about environmental education and the use of the outdoor classroom, especially as the outdoor area grows and changes.

In conclusion, the outdoor classroom continues to be a work in progress. It is important to maintain the momentum of accomplishing projects and encouraging teachers and students to explore and learn within nature outside. We will need to continue to include the community and all school members in the growth of the outdoor classroom. I think we’ll be amazed at what will be created.
Bibliography


Euler, J. (1981). *Developing an Outdoor Education Program for Public Schools.* Eric/Cress, Outdoor Education Fact Sheet, New Mexico University, Las Cruces, N.M.


Appendix A

Surveys
Parish Council Presentation (Data)
Correspondences
Dear Parents,

RCC is appealing to you for help. We are not asking for money, just a few minutes of your time.

The mission of RCC is to offer your child/ren the best possible education. We would like your assistance to find out how we are doing in providing a good education and how we might improve, especially in regard to teaching about the environment. What we would like is for you to offer your candid, honest opinion of the education offered at RCC.

As an enclosure with this letter, you will find a questionnaire. We ask that you take a few minutes to fill out the questionnaire and then return it to school with your child.

Thank you so much for your gift of time.

Sincerely,

Mrs. Paula Schneider
RCC Outdoor Classroom
Parent Questionnaire

Please circle your answer.

<table>
<thead>
<tr>
<th>I think students learn better through hands-on, real-life experiences.</th>
<th>Strongly agree</th>
<th>Somewhat agree</th>
<th>Somewhat disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think students should spend time learning outside on a regular basis.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>I think learning about the outdoors (nature) is an important part of a student's formal education.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>I think the present school site at RCC (south bldg) is conducive to students learning outside.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>I believe students should go outside and learn about nature in most kinds of weather provided they are properly dressed.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>It would be easier, as a parent, if students could learn about nature outside without having to leave school grounds (no permission slips nor cost).</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>I think even though the RCC south bldg school site cannot be changed dramatically due to location, what can be done within reason to incorporate outdoor learning should be done.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
</tbody>
</table>

I would be willing to help out in some way in creating an outdoor classroom at RCC. Name:  

I would like to receive the results of this survey. Name:  

Thank you for taking the time to complete this questionnaire. Please return to RCC by ____________.
| **RCC Outdoor Classroom**  
| **Faculty Questionnaire**  
| **Please circle your answer.** |

<table>
<thead>
<tr>
<th>I think students learn better through hands-on, real-life experiences.</th>
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<tr>
<td>On average, I take my class outside for instruction at least once per month.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>I would take my class outside for instruction more often if the school site was more user friendly.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>It is important to make the playground at RCC more conducive to outdoor education.</td>
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<td>Somewhat agree</td>
<td>Somewhat disagree</td>
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<td>I am aware the WDPI has created a set of standards addressing environmental education.</td>
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<td>Strongly disagree</td>
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<td>On average, I incorporate environmental topics in my instruction at least once per month.</td>
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<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>If an outdoor classroom were created, including a woodland area and educational stencils on the pavement, I would use it as a teaching resource.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>If I were presented with an inservice opportunity to learn more about environmental education and the use of an outdoor classroom, I would be more likely to take my students outside for class.</td>
<td>Strongly agree</td>
<td>Somewhat agree</td>
<td>Somewhat disagree</td>
<td>Strongly disagree</td>
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</tbody>
</table>
If I had resource guides with activities aligned with environmental education and academic area standards for use with the outdoor classroom, I would increase my use of the outdoors with my class and the amount I teach environmental education.

<table>
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<tr>
<th>Strongly agree</th>
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</tr>
</thead>
</table>

I would be willing to use class time to have my students help out with the creation of an outdoor classroom as long as it is educational.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Somewhat agree</th>
<th>Somewhat disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
</table>

I would be willing to be on a committee to help out with the creation of an outdoor classroom for RCC. Name:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

What components would you like in an inservice regarding environmental education and an outdoor classroom: Circle your choice(s)

- a. Overview of environmental education standards
- b. Tour of the outdoor site
- c. Hands-on teaching techniques
- d. See lessons taught by others
- e. Copies of lessons
- f. Question and answer session
- g. Standards/curriculum connections
- h. Other ___________________________
<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>No opinion</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think I learn better when I am outside.</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
<tr>
<td>I think it’s easier to pay attention to what I’m being taught outside.</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
<tr>
<td>I think it’s important to learn about nature by being outside.</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
<tr>
<td>I think the playground should be changed so that classes can be held</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
<tr>
<td>outside sometimes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would like to help design an outdoor classroom at RCC.</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
<tr>
<td>I would like to help make an outdoor classroom at RCC.</td>
<td>No</td>
<td>No opinion</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Teacher Questionnaire for Outdoor Classroom

- Learn better hands on: 100%
- Learn outside sometimes: 100%
- Do take class outside*: 22%
- Would take class out*: 89%
- Imp. to change site: 89%
- Would use site w/changes: 78%
- Use classtime to create*: 100%
- Be on committee: 89%

*significant: "limited classtime
89% = 8/9, 78% = 7/9
9/11 returned = 81% return
Overview of Outdoor Classroom Questionnaires

- Ed. outside is important: 91%
- Currently use outside: 66%
- Would use if created: 81%
- Willing to help: 81%
- Need field guides: 89%
- Need inservice: 89%

Includes parent, faculty, & student results.
Student Questionnaire for Outdoor Classroom

- learn better outside: 89%
- easier to pay attention: 70%
- imp. to be outside: 99%
- site should be changed: 79%
- help design: 86%
- help make: 86%

Percent in Agreement
Parent Questionnaire for Outdoor Classroom

- learn better hands on: 100%
- should learn outside: 92%
- EE imp. part of ed.: 97%
- site not conducive*: 66%
- outside in most weather: 84%
- easier w/o leaving site*: 64%
- site should be changed**: 99%
- willing to help: 46%

*questions poorly written, possibly misunderstood
**significant
54% returned (86/158) excellent response
Environmental Education ... 
In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.

... Outdoor Classroom

Rhineland Catholic Central
28Jan04

Dear Parent/Guardian,

Thank you so much for responding to the outdoor classroom questionnaire sent out in December. Your input is greatly appreciated. A high number of questionnaires were returned with an overwhelming positive response to improve the south building outdoor site. The information from parent, faculty and student questionnaires was presented to the Committee of Education on January 13th, and the committee approved the request to form an outdoor classroom committee to draw up structural and financial plans for an outdoor classroom.

When you filled out the questionnaire, you indicated an interest in helping out with the creation of the outdoor classroom. Thank you, as there is much that will need to be done in order for this to be successful. Right now we are looking for people willing to offer their ideas and talents on a planning committee for the outdoor classroom. The committee will consist of 2-3 students, 2-3 teachers, 3-5 parents, a member of the building & grounds committee, a forester consultant, and myself as chairperson.

If all goes well, by this summer we will be looking for help on the actual construction of the outdoor classroom. This would be another area to help out. Please check the box that indicates the help you would be willing to give & return the bottom portion of this sheet to the school.

Thank you so much for your generosity and enthusiasm. Together we can make the improvement of the south building school site a reality.

Sincerely,

Mrs. Patra Schneider

☐ I have ideas and would like to be a part of the planning committee. This time frame would work the best for me:

  ____ Saturdays, 8am to noon
  ____ Sundays, 11:30 to 3:30
  ____ weekday evenings: ___Mon ___Tues ___Wed ___Thurs

☐ I would like to help out with the construction. Please contact me when I'm needed.

  Area of special interest/expertise____________________

Name: ____________________________ Phone: ____________________________
Environmental Education...


In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.


Outdoor Classroom

Rhinelander Catholic Central
23Jan04

Memo: Outdoor Classroom update

To: So. Bldg Staff

Thank you to everyone that took the time to fill out the outdoor classroom questionnaire in December. I received overwhelming positive responses from you and from parents. On January 13th, I presented to the Committee of Education asking for permission to proceed by forming a committee to come up with a structural and financial plan for an outdoor classroom. The committee of Education approved my request!

Now on to the next step, forming the committee. I'd like to form a committee consisting of 2-3 students, 2-3 teachers, 3-5 parents, a member of the building & grounds committee, a forester consultant, and myself as chairperson. If you would be interested in being on the committee, please let me know as soon as possible.

Also, when we have our building activity next week, I'd like to invite the students to give their input by filling out a form (attached) in groups of 3-4 students, mixed grades (3rd & 6th, 4th & 7th, 5th & 8th). I will lead the activity immediately following our building project; this should only take about 15 min. total.

Thank you for all your help & enthusiasm☺

Paula
In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.

... Outdoor Classroom

Rhinelander Catholic Central
11Feb04

I am looking for a few students to be on the committee for creating the outdoor classroom. Please answer the following questions if you are interested.

1. What are some ideas you have to change the playground into a place where we can learn about nature and have classes outside more often?

2. Would you like to be involved in changing the playground?

3. Do you like discussing your ideas with adults?

4. Do you think you have good ideas and that others would like to hear them?
Environmental Education ...

In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.

... Outdoor Classroom

Rhinelander Catholic Central
12Mar04

Dear ,

I'm sorry you were unable to make it to our first meeting. It was very productive, however, and we're off to a good start. Below is a compilation of the strengths, weaknesses, opportunities and threats to our outdoor classroom that we came up with at our meeting. Our next meeting will be Thurs, Mar 25th, 6pm to 7:30 pm in the IMC. Please let me know if you will not be able to make it.

Thank you for your time,

Paula Schneider

INTERNAL STRENGTHS:
Volunteers: families, students, staff
Location: flexible, safe, possible to have environmental variety, sheltered
Wildlife: we have birds, small mammals, healthy plants
Education: hands-on learning, alternative learning
Access to: sun, water, grass, good drainage, blacktop that may be able to be taken out
Garage for storage or classroom, place to relax, beautifies the school

INTERNAL WEAKNESSES:
Small space, need for parking & truck deliveries, a lot of blacktop & not much grass, cost, road too close, snowplowing & snowhill, possible vandalism, new concept for some & a lot of work- may not be accepted, problems from neighbors, summer maintenance, limited wildlife, questionable soil, garbage cans

EXTERNAL OPPORTUNITIES:
Able to plant trees & flowers, others in the community that can help us (foresters, biologists, master gardeners, conserve & charter schools), positive publicity, small area can be a big success- ability to start small, help to unify church, ongoing activities, sell compost, $ from grants & fundraisers to cover cost, could be used by other groups.

EXTERNAL THREATS:
Vandalism, pollution, parking, snow, pet damage, money/cost, liability, city ordinances, differences of opinions, possible new facility with parishes combining, uncooperative neighbors
Environmental Education ... 

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... Outdoor Classroom

Rhinelander Catholic Central
4Apr04

Dear,

Thank you for coming to last week’s meeting. We now have an idea of where we would like to start with the outdoor classroom. Below I’ve listed all of the ideas we came up with when we answered the question “What kind of facility would you like to see developed at RCC”. Our next meeting will be Tues, April 13, 6pm to 7:30 pm in the IMC.

I hope to see you there!

Thank you for your time,

Paula Schneider

Ideas from group C

- Rolling terrain
- Sectioned garden/rotational plantings
- Drinking fountain
- Gazebo
- Rock/shell garden
- Green roof
- Composting
- Prayer garden/maze
- Seating area
- Nature area
- Blacktop for learning stencils
- Telescope area
- Picnic/lunch area
- Coi (fish) pond
- Nature path
- Sports area (field & blacktop)
- Classroom in garage
- Walk-through garden
- Low ropes course
- Animals on display
- Water garden
- Pond w/bridge and/or beach
- Garden area w/pond and/or fountain
- Bird area/houses
- Butterfly garden

Ideas from group V

- slide
- rock garden
- winter igloo/tepee
- organic garden
- desert garden area
- pyramid
- sundial
- telescope
- timeline
- climbing plants on frame
- vegetable garden
- flower/butterfly garden
- wetland area
- pond for amphibians
- greater variety of trees
- spice garden
- composting/worm bed
- variation in grasses
- wildlife/bird feeding area
- windmill
- fruit bearing trees
- solar panels
- water fountain
- greenhouse w/tropical plants
- covered classroom
Greenhouse
Picket fence & trees

Top 5 picks

Greenhouse
Garden - sectioned & rotated crops
Garden area w/pond and/or fountain
Pond w/bridge and/or beach
Classroom in garage

greenroof
bathouses

Top 5 picks
outdoor classroom
vegetable garden
composting
wetland
flower garden
In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.

Outdoor Classroom

Rhinelander Catholic Central
18Apr04

Dear [Name],

Thank you for coming to last week's meeting. It was great to get outside and look at what we have to work with for creating the outdoor classroom. Below I have included the members of the different sub-committees. Our next meeting will be Wed., May 5th, 6pm to 7:30 pm in the science lab upstairs (So. Bldg). Even though we will all be meeting, we will be splitting up into sub-committees for most of the time. This should be a very productive meeting, so please try to be there.

Thank you for your time,

Mrs. Schneider

Greenhouse/Gardening
Amy Williams – chairman
Ted Lassig – secretary
Chris Sykes
Mary Schneider
Lauren Barnes
Danielle Kennedy
Alissa Spafford
Jeff Forsyth
Kathie Babcock
Braxton Hjelle
Sue Katchko

Classroom Structure
Liz Olejnik – co-chair
Sandy Jones – co-chair
Shauna Rapple
Karie Simon
Craig Sackett
Daryl Dean

Wetland/Pond
Sam Schneider – chairman
Susan Jurries – secretary
Marcy Keiffer
Joan Stingl

Blacktop
Candy Strand
Georgia Laska
John Potters

Resource information
Paula Schneider
Jim Winkler
Projected use of outdoor classroom 81% would go out more if curated.

I believe students should go outside and learn about nature in most kinds of weather provided they are properly dressed. (parent)

I would take my class outside for instruction more often if the school site was more user friendly. (faculty)

I believe I would teach more environmental education if RCC had an outdoor classroom. (faculty)

If an outdoor classroom were created, including a woodland area and educational stencils on the pavement, I would use it as a teaching resource (faculty)

I think the playground should be changed so that classes can be held outside sometimes. (student)

Willingness to help in creation of classroom 81% willing to help.

I would be willing to use class time to have my students help out with the creation of an outdoor classroom as long as it is educational. (faculty)

I would be willing to be on a committee to help out with the creation of an outdoor classroom for RCC. Name:____________________ (faculty)

I would be willing to help out in some way on creating an outdoor classroom at RCC. (parent)

I would like to help design an outdoor classroom at RCC (student)

I would like to help make an outdoor classroom at RCC (student)

Need for field guides

If I had resource guides with activities aligned with environmental education and academic area standards for use with the outdoor classroom, I would increase my use of the outdoors with my class and the amount I teach environmental education.
### Importance of outdoor, hands on education

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Statement</th>
<th>Responder Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>I think students learn better through hands-on, real-life experiences</td>
<td>parent</td>
</tr>
<tr>
<td>92%</td>
<td>I think students should spend time learning outside on a regular basis.</td>
<td>parent</td>
</tr>
<tr>
<td>97%</td>
<td>I think learning about the outdoors (nature) is an important part of a</td>
<td>parent</td>
</tr>
<tr>
<td></td>
<td>student’s formal education.</td>
<td></td>
</tr>
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<td>99%</td>
<td>I think even though the RCC school site cannot be changed dramatically</td>
<td>parent</td>
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<tr>
<td></td>
<td>due to location, what can be done within reason to incorporate outdoor</td>
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<td></td>
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<td>89%</td>
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<td>faculty</td>
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<tr>
<td></td>
<td>outdoor education.</td>
<td></td>
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<tr>
<td>61%</td>
<td>It would be easier, as a parent, if students could learn about nature</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>cost).</td>
<td></td>
</tr>
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<td>89%</td>
<td>I think I learn better when I am outside.</td>
<td>student</td>
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<td>70%</td>
<td>I think it’s easier to pay attention to what I’m being taught outside</td>
<td>student</td>
</tr>
<tr>
<td>99%</td>
<td>I think it’s important to learn about nature by being outside</td>
<td>student</td>
</tr>
</tbody>
</table>

### Background of responder (use of outdoors in past,...)

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Statement</th>
<th>Responder Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>78%</td>
<td>On average, I take my class outside for instruction at least once per</td>
<td>faculty</td>
</tr>
<tr>
<td></td>
<td>month.</td>
<td></td>
</tr>
<tr>
<td>36%</td>
<td>I am aware the WDPI has created a set of standards addressing environmental</td>
<td>faculty</td>
</tr>
<tr>
<td></td>
<td>education.</td>
<td></td>
</tr>
<tr>
<td>67%</td>
<td>On average, I incorporate environmental topics in my instruction at least</td>
<td>faculty</td>
</tr>
<tr>
<td></td>
<td>once per month.</td>
<td></td>
</tr>
<tr>
<td>66%</td>
<td>I think the present school site at RCC is conducive to students learning</td>
<td>parent</td>
</tr>
<tr>
<td></td>
<td>outside.</td>
<td></td>
</tr>
</tbody>
</table>
Need for inservice

If I were presented with an inservice opportunity to learn more about environmental education and the use of an outdoor classroom, I would be more likely to take my students outside for class.

What components would you like in an inservice regarding environmental education and an outdoor classroom:

- Overview of environmental education standards
- Tour of the outdoor site
- Hands-on teaching techniques
- See lessons taught by others
- Copies of lessons
- Question and answer session
- Standards/curriculum connections
- Other
Dear,

Thank you so much for your interest in improving the school grounds and working towards creating an outdoor classroom. I'm hoping that the planning will go smoothly and quickly. Our first committee meeting will be Thursday March 11th, 6pm in the IMC at St. Mary's. At this meeting we will go over what the goals are for creating outdoor learning sites in general and brainstorm ideas for RCC's outdoor classroom in particular. So, please bring any ideas you may have!

Please call me if you cannot make it on the 11th. And again, thank you for your donation of time.

Sincerely,

Paula Schneider
H- 369-8888
W- 362-5588
Environmental Education ...

In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.

... Outdoor Classroom

Rhinelander Catholic Central
2March04

Thank you for your willingness to be on the outdoor classroom committee. I will be counting on you to help me keep the other students informed about the outdoor classroom. Our first meeting will be Thursday March 11th, 6pm in the IMC. Please let me know if you cannot make it to the meeting.

Thank you for your time😊

Mrs.Schneider
Idea Proposed: expand the sisters garden & put pond in with wind/solar aeration system

Committee members: Sam Schneider, Joan Stingl, Marcy Keiffer

Purpose: To give students a peaceful area with water to learn about renewable resources

Proposed location: in sisters garden part of blacktop

Description /dimensions:
We want a 12 x 20 ft pond with aeration system, so we can have fish, plants in year around in pond in the extended area. We would have a natural garden with a path around the pond with stepping stones made by students & seating benches.

Materials needed, cost & possible financing:

<table>
<thead>
<tr>
<th>Item</th>
<th>cost</th>
<th>possible financing/donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 x 20 liner (3,000 gal)</td>
<td>$269.98</td>
<td>Grant</td>
</tr>
<tr>
<td>3,000 gal pump</td>
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<tr>
<td>3,000 gal filter</td>
<td>$249.98</td>
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<tr>
<td>Seating benches</td>
<td>donation or make</td>
<td>made in art</td>
</tr>
<tr>
<td>Stepping stones</td>
<td></td>
<td></td>
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<td>All tentative energy aeration</td>
<td>$1,000</td>
<td>Grant</td>
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<tr>
<td>Plants/seeds</td>
<td>$200/donated</td>
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</tbody>
</table>

Timeline:
Sept 14 present to school committee of education
Sept 14-July write grants
whole school year make stepping stones & start plants
Summer of 2005 dig pond, take out blacktop, construction

Contacts - experts/Helpers:
 teacher serves Aug 30, mon 2:00-3
 Jeff & Marcy
 committee of educators sept 6:30
 Sam, Marcy & Joan

A-22
Idea Proposed: Paint Blacktop With Educational Channels

Committee members: John Potters, Candy Strand, Georgia Leska

Purpose: To create an outdoor environment conducive to continual learning through guided instruction and play. (Interactive, Hands on learning)

Proposed location: South Building Blacktop

Description /dimensions: See map

Materials needed, cost & possible financing:

<table>
<thead>
<tr>
<th>Item</th>
<th>cost</th>
<th>possible financing/donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stencil - World</td>
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<tr>
<td>Stencil - US</td>
<td>$80</td>
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<tr>
<td>Paint</td>
<td></td>
<td></td>
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<tr>
<td>Paint brushes/rollers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chalk (Sidewalk)</td>
<td></td>
<td></td>
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</tbody>
</table>

Timeline:

- July 18: Proceed to Teachers - Input information
- Fall 2023: Continue in Spring

Contacts – experts/Helpers:
Pete Biola - Candy Strand - Tom Urban - Clark
Idea Proposed: Convert sister's garage to outdoor classroom

Committee members: Daryl Dean, Sandy Jones, Karie Simon, Shauna Rappleye, Craig Sackett

Purpose:
To provide a place that is out of the elements but still outside for outdoor instruction, and to provide storage for outside educational materials.

Proposed location: "Sister's garage @ So. Bldg"

Description /dimensions:
22' x 24' + add 10' in front of garage door for 3 season sun/garden room.

Materials needed, cost & possible financing:

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<tr>
<th>Item</th>
<th>cost</th>
<th>possible financing/donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>lights</td>
<td></td>
<td>Gaber - take-out lights</td>
</tr>
<tr>
<td>Shelving</td>
<td></td>
<td>Schneiders - lights</td>
</tr>
<tr>
<td>plywood, hinges, legs, bracket</td>
<td></td>
<td>ask paunchonew vs/ flyer</td>
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<tr>
<td>benches - 2x8 split logs</td>
<td></td>
<td>Gaber, Forsyth</td>
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<tr>
<td>electrical upgrade (out)</td>
<td></td>
<td>School</td>
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<tr>
<td>First Aid Kit</td>
<td></td>
<td>Paula/School</td>
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<tr>
<td>Flip chart/MacKee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Timeline:
- Sept approval to use - 14th Sandy 6:30
- '04 Fall - benches, lighting, clean, paint
- '05 Spring - stoops, new doors, gutters, rain barrels
- '04 Fall - apply for greenhouse grants
- '06 Summer - upgrades for greenhouse etc

Contacts - experts/helpers:
Hassig home owners  Daryl - 493-9034 cell
Environmental Education...

*In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.*

... Outdoor Classroom
Nativity Catholic School
12Apr05

Outdoor Classroom Committee
Nativity of Our Lord Catholic School
103 E King St.
Rhineland, WI 54501

To Whom It May Concern:

The outdoor classroom committee at Nativity of Our Lord Catholic School (formerly RCC) would like to invite you to participate in an on-going fundraising program that will benefit your business and help provide needed money to help make our Outdoor classroom concept a reality.

**Background:**

Environmental Education is education that encompasses all subject areas (not just science) and raises students’ awareness, appreciation and understanding of our natural world. Its goal is to help students become good citizens and stewards of our natural resources. Being outside in nature brings tremendous value to students’ education, appreciation of life and environmental behavior, especially for a school in an urban setting. Outdoor nature experiences help students get in touch with their natural pre-disposition to be connected with nature, increase students’ awareness and sensitivity to nature and are integral to environmental behavior and responsible citizenry.

Nativity of Our Lord Catholic School, under the guidance of our science teacher, Mrs. Paula Schneider, has developed a plan to build an Outdoor Classroom on the grounds of the school. Many projects associated with this plan are costly and will need to be developed over a period of time.

**Proposal:**

This is where your help is needed. We would like your cooperation with a “Can Do” fundraiser. With your permission, once a month volunteers from the Outdoor Classroom Committee will pick up your aluminum cans in order to recycle them to raise money. All you would have to do is allow us to take your aluminum cans! It’s so easy! In return, we will give you a receipt as to the amount of money donated to the Outdoor Classroom and the receipt can be used as a charitable tax write-off.

A member of the Outdoor Classroom Finance Committee will be contacting you the week of April 25th. Please consider this proposal and if you have any questions, we would be happy to answer them when we call you. If you would like to contact us, you may call Paula Schneider @ 369-8886. Thank you for your time.

Sincerely,
Nativity Catholic School Outdoor Classroom Finance Committee
In order to be good stewards of our natural resources as world citizens, we aim to increase our knowledge, awareness and appreciation of the natural world.
Nativity Catholic Outdoor Classroom
REQUEST FOR FUNDS FORM

Date of request: ____________ Date $ is needed by: ____________

Committee: __________________________

Amount requested: ________________

Reason for request: __________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Any other possible sources of income (ie donations, ...): ______________________
__________________________________________________________________________

Signature of committee chairman: __________________________
Contact phone number: ____________________

Please turn in to a member of the finance team (Paula Schneider, John or Dona Potters, or Julie McGuire). You will notified of approval/denial within a month.

-----------------------------------------------------------------------------------------------
Office Use Only
Date Approved: ____________; Amount approved: ____________; receipts received: ________
Actual amount used: ______________ Signature: __________________________
Appendix B

Classroom structure plans
Photos of project
Proposed Reuse of the Sister's Garage

- Mounted Solar Panels - Photovoltaic System
  (May Produce 6 to 8 kilowatts electrical power)
  Option: "Live - Green Roof"
  (Requires Structural Upgrade of Existing Roof Trusses)

- Polycarbonate Glazed Greenhouse System
  w/ Concrete Masonry Base Wall Construction

Outdoor Classroom - Schematic Exterior

Daryl J. Dean, AIA
10 August 2004
Proposed Reuse of the Sister's Garage

Poly carbonate Glazed Greenhouse System w/ Concrete Masonry Base Wall Construction

New Concrete Slab Stoop & 3' Metal Frame and Door
Rain Water Collection
Wall & Base Cabinets w/ Work Counter
Daylighting w/ Solar Light Tubes
Classroom Work Tables & Chairs
Marker Boards & Tack Surfaces w/ Display Rail
Retractable Projection Screen
A/V Cart w/ 1V & DVD-Video Player
Wall & Base Cabinet w/ Work Counter
New 5' Dutch Doors & Metal Frames
Rainwater Collection
Work Bench & Shelving
Reclaimed Concrete Paver or Brick Paver Flooring
Planting & Work Tables
Concrete Filled Pipe Bollards

Outdoor Classroom - Schematic Floor Plan
Donal J. Dean, AIA
10 August 2004
Summer '04  Grace Garden before project.
Fall '05

The Clubhouse

B-9
LEAF LESSONS—Teachers from both the Rhinelander School District and Nativity Catholic School participated in a LEAF (Learning, Experiences & Activities in Forestry) workshop March 3 & 4. The 25 educators were acquainted with lessons designed to teach all grade levels about the value and importance of Wisconsin's Forests. Pictured are educators demonstrating for the class some of the lessons. (Submitted photo)

PLAYING IN THE DIRT—A group of enthusiastic 4th graders rake soil Friday for their new outdoor classroom. The classroom, which in the spring will become a meadow after flowers are planted, was once a parking lot behind the Rhinelander Catholic Central building. All classes are taking part in raking the soil and preparing it for planting. "We're trying to make this less of a city school," said staffer Paula Schneider. (Daily News photo by Heather Schaefer)
Appendix C

WEEB Grant
As we enter a time of crises in regards to air pollution and the supply of fossil fuels, it is our duty to educate students on the advantages of alternative energy forms. Rhinelander Catholic Central (RCC) Elementary School's goal is to create an aeration system for a school site pond that uses both solar and wind power. Using this continuous visual example of renewable energy at work, a two week unit for 8th grade students will be created using KEEP activities. It is also imperative for students to be aware of the importance of diversity in our ecosystems; therefore, a two week unit on Wisconsin wetland ecosystems will be created for the 7th grade students. They will be exposed to ways to collect data on diversity and water quality; of special attention will be the advantages of high dissolved oxygen due to aeration. The pond site will also be incorporated into an existing unit for the 6th grade on surface water.
Project Title: Expanding Alternative Energy Education at Rhinelander Catholic Central School and the Rhinelander Community.

Administrative Organization: Lumberjack Resource Conservation and Development Council, Inc

Statement of Need

Target Audience: The main target audience is the 6th, 7th, and 8th grade students at RCC (60 students). The secondary audience will be the other students in the school (about 80), their parents, and the community of Rhinelander.

Need: As air pollution from and supply of fossil fuels becomes more of a concern, the future generation needs to be aware of the alternatives to non-renewable resources. It is also imperative that our future leaders are aware of the diversity and value of all our ecosystems, especially wetlands. In an informal survey of 50 students, only 5 were aware of the uses of wind & solar energy, and only 7 could define diversity with regards to ecosystems. To be exposed to a working alternative energy source and a wetland on a daily basis would be tremendously beneficial to increasing students' awareness & knowledge of the environment.

Previous Effort: In the past 2 years, alternative energy and ecosystems have been briefly touched on within the curriculum units of energy (8th) and ecology (7th), respectively. Two electives have been taught in the last year, Alternative Energy and Wetlands, but they have only had an enrollment of 10 students each. This enrollment was small because of transportation needs to take students off site to visit an alternative energy house and wetland area. All students need to be exposed to this information; therefore, the need for an on-site system. The 6th grade did a unit on surface water during the '03-'04 school year in which they tabulated the amount of surface run-off from the playground and suggested uses for the run-off water. This pond, which will be on-site surface water, will lend itself well to this existing unit.

Priorities Addressed: This project will address priorities C, D, & E. It addresses C – Make use of existing resources because Wisconsin K-12 Energy Education (KEEP) activities will be used for the 8th grade curriculum. Also, Paula Schneider will be utilizing her training in environmental education at UWSP. This project addresses D - Create new environmental education resources by creating a wetland and incorporating alternative energy into the site. It also addresses D – Promote implementation of EE standards by developing two - two week units and supplementing an existing unit that address EE standards.

Project Goals, Objectives, and Activities

Goal 1: Outdoor site creation. This goal is for the creation of an on-site wetland/pond area that uses wind and solar for aeration (which is important for water quality). This will help increase all 120 students' awareness of alternative energy and the diversity of wetlands. All teachers will be encouraged to use the site for educational purposes; the 6th, 7th, & 8th grade science teacher will incorporate units utilizing the site. Timeline: Construction to begin in July '05 with removal of blacktop, soil testing, and creation of pond. The wind turbine and solar system with electrical back-up will be installed to aerate the pond. During the fall '05, classes will help with the planting of wetland/pond plants and maintenance of the site.

Goal 2: Student Alternative Energy Education. This goal is for the 8th grade students at RCC to increase their awareness of and understanding of non-renewable and renewable energy forms. This will be accomplished through KEEP activities “The Energy Divide” (p.D76), “Dirty Half Dozen” (p.E57), “The Miracle of Solar Cells” (p. D134), “Why Use Renewable Energy” (p.M25), and a lesson on wind energy from an alternative source. KEEP staff will review the unit created. The on site wind & solar system will be incorporated in every possible way, and it will be continually referenced to. Timeline: Curriculum unit will be created during July & August '05. Unit will be taught during the '05-'06 school year with the completion of the outdoor site.

Goal 3: Student ecosystem education. This goal is for the 7th grade students at RCC. Through the completion of an ecosystem unit, they will increase their awareness and knowledge of
ecosystems in general and Wisconsin wetland ecosystems in particular. Through the use of data collection, they will study plant & animal diversity, habitats, and water quality. One of the activities for water quality will be testing the dissolved oxygen in aerated vs. non-aerated water and the diversity of life it can support. Their data will be tabulated in the form of graphs & charts. The students’ ecology textbooks, plus project WILD aquatic and other resources will be used for this unit. Timeline: Curriculum unit will be created during July & August '05. Unit will be taught during the '05-'06 school year with the completion of the outdoor site.

**Goal 4: Student surface water education.** Through this goal, the 6th graders at RCC will increase their awareness and knowledge of surface water. In the unit on surface water, students, through their textbook and DNR groundwater materials, become aware of the value of and the limited supply of fresh surface water. The students use math skills to tabulate the total surface area of the blacktop playground and calculate the amount of run-off annually. They will be able to see a beneficial use to the run-off with the pond/wetland ecosystem and all the life it supports. They will also be able to test water quality, pure run-off water vs. water filtered through the wetland. Timeline: Unit, with the addition of testing the pond, will be taught during the '05-'06 school year with the completion of the outdoor site.

**Goal 5: Community environmental education.** This goal is to increase community residents’ awareness and knowledge of the environment and environmental issues. In the past, all grades create a presentation for RCC’s Science Fair/Earth Day Celebration on April 22nd to which the community is invited to attend. For the '06 celebration, the 6th, 7th, and 8th grade students will focus their project on one aspect of the unit they have been studying (goal 2, 3, & 4). The 8th graders will utilize KEEP activities “Evaluating Your Home or School for Solar & Wind Power” (p.M76), “Careers in Energy” (p. M42) and a choice from “Energy Action Plan” (p. M112). The 6th & 7th graders will choose a topic that they have become interested in during the unit and research it. All students will be lead through an issue investigation & citizen action plan for their topic (citizen action skills), and will be evaluated on the quality of a flyer/bookmark created to present their information. This flyer/bookmark will be available to residents during the '06 Earth Day.

**Dissemination:** The project director will maintain financial records of the project. Students will write press-releases during their English class about the enhancement to the school grounds and the role the WEEB grant played. They will also write press-releases advertising and inviting the public to the Science Fair/Earth Day Celebration '06. Funds will be used to have a survey in the daily newspaper questioning residents’ environmental awareness and to print up flyers or bookmarks for distribution to the public. RCC will also hold an open house for the outdoor site, inviting the public and the press, the end of May '06. KEEP will be consulted on ideas on how best to reach the public.

**Evaluation:** The students will be assessed through pre & post unit tests. Student created flyers/bookmarks and press-releases will be evaluated. Non-formal evaluation (survey) will be obtained from the public, teachers, and students that participate in the Science Fair/Earth Day celebration.

**Staff Qualifications:** Paula Schneider – BS Sec. Ed. Biology; Projected MS Environmental Education June '06. Six years teaching experience junior high science, three years at RCC. Paula is a current member of WAEE.

**Continuation:** This project will continue to grow as our outdoor classroom continues to grow; this is the first step in the plan. There are 10 parents/teachers and 10 students on the outdoor classroom committee who will continue to meet to improve the outdoor site for educational purposes. Staff will be inserviced on an annual basis as to the improvements and ideas on how to incorporate them into their curriculum. Funding will continue through a number of fundraising activities: aluminum can and printer cartridge recycling.
<table>
<thead>
<tr>
<th>Salary/Honoraria</th>
<th>Activity</th>
<th>Grant Request</th>
<th>Match</th>
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<tbody>
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<td>Equipment operator 1 hr @ $20/hr</td>
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<td>Soil test 2 hrs @ $15/hr for each installer</td>
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<td>Windmill/solar panel Carrie Hembree 10 hrs @ $20/hr</td>
<td>KEEP consultation/review units</td>
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<td>Joanne Tremblay 16 hrs @ $15/hr</td>
<td>Lumberjack RC&amp;D project asst/bookkeeper</td>
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<table>
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<table>
<thead>
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<td>Materials/Supplies</td>
<td>Activity</td>
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<td><strong>Non-Capital Items:</strong></td>
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<tr>
<td>Topsoil</td>
<td>Goal 1</td>
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<td>Water plants for pond</td>
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<td>Sand &amp; gravel</td>
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<td>Topsoil</td>
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<td>Water plants</td>
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<td>Bushes for border</td>
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<td>Benches</td>
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<td>Permits</td>
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<td>DC voltmeter/ammeter</td>
<td>Goal 2</td>
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<td>Solar cells</td>
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<td>Tri-fold posters</td>
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<td>Printing of bookmarks/flyers</td>
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<td>Newspaper survey/ad</td>
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<td>Dissolved oxygen meter</td>
<td>Goal 3 &amp; 4</td>
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<td><strong>Other</strong></td>
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<td><strong>TOTAL</strong></td>
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</table>
Appendix D

Lesson plans submitted by teachers
MEMO
To: All teaching staff
Re: request for outdoor classroom lesson plans
Dear Fellow Teachers,

Most of you were here when I began the outdoor classroom in the fall of 2003 by asking you to complete a survey. According to that survey the faculty was in almost 100% agreement that hands-on, outdoor education is important. 89% of faculty responded that they would take their classes outside if the school site was more user friendly. 89% said an inservice on environmental education and the outdoor classroom would be helpful.

Well, the outdoor classroom is now well on its way to reality. The meadow is green (although weedy), the stencils are on the blacktop, and we hope to have the garage ready in a month. So now is the time to address the use of the outdoor classroom.

In order to help in this area, I am requesting **two lesson plans that can be used outside on our school sites** from each teacher. These can be lesson plans you create or can be from another source (project WILD, LEAF, textbook, etc. Please site the source). If possible, please have the plans **to me before Thanksgiving break**.

I will be compiling the lessons and aligning them to environmental education standards. I will then present them to you at an inservice this spring along with an overview of E.E. standards, hands-on outdoor teaching techniques and our outdoor classroom.

I really appreciate the time you take in getting me the two lesson plans. It will be well worth it when we are able to use our outdoor classroom to its fullest extent.😊

Thank you!

Paula
## Table of Contents

<table>
<thead>
<tr>
<th>Lesson #</th>
<th>Title</th>
<th>Grade</th>
<th>Subj. area</th>
<th>Outdoor area</th>
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<td>2</td>
<td>Human Sundial</td>
<td>3</td>
<td>science</td>
<td>blacktop</td>
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<td>3</td>
<td>Producers vs consumers</td>
<td>4</td>
<td>E.E., science</td>
<td>meadow, graph</td>
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<td>4</td>
<td>Where am I?</td>
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<td>social studies</td>
<td>U.S. map</td>
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<td>Insects &amp; Worms</td>
<td>PreK/K</td>
<td>E.E., science</td>
<td>meadow</td>
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<td>PreK/K</td>
<td>E.E., science</td>
<td>pond</td>
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<td>7</td>
<td>Living &amp; Non-living</td>
<td>K</td>
<td>science</td>
<td>grass/meadow</td>
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<td>8</td>
<td>Needs of Plants</td>
<td>K</td>
<td>E.E., science</td>
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<td>Environmental Barometer</td>
<td>PreK-4</td>
<td>E.E., science</td>
<td>school yard/CAVOC</td>
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<td>Habitetracks</td>
<td>K-4</td>
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<td>all</td>
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<td>Erosion</td>
<td>2-6</td>
<td>science</td>
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<td>Everybody Needs a Home</td>
<td>K-4</td>
<td>E.E., science, L.A.</td>
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<td>Let’s go exploring</td>
<td>K</td>
<td>E.E., science</td>
<td>school yard/CAVOC</td>
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<td>K</td>
<td>science</td>
<td>Sisters’ yard</td>
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<td>All Aboard My Tree</td>
<td>K-1</td>
<td>science</td>
<td>tree in yard</td>
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<td>Learning to Look…</td>
<td>K-4</td>
<td>E.E., L.A.</td>
<td>all/any</td>
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<td>religion</td>
<td>all/any</td>
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<td>20</td>
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<td>sisters’ yard/CAVOC</td>
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Lesson One

Making a Trail Map

Grade Appropriate: 3
Subject Area: Social Studies
Outdoor Classroom Area: All

Objective: Students use map skills to plan and create a trail map.

Procedure:

1. Discuss as a class how maps help people follow roads or trails.

2. In pairs, students create a map of the playground using landmarks. They also add a trail for another group to follow.

3. Students trade maps with another group and follow the trail.

4. Students give feedback (i.e. What was easy to follow? What was confusing? Why?)
Lesson Two

Human Sundial

Grade Appropriate: 3
Subject Area: Science
Outdoor Classroom Area: Blacktop

Objective: Students see how the turning of the earth has an effect on their shadows at different times of the day.

Procedure: This activity should be done three times on a sunny day.

1. In pairs, students draw each other’s shadow. (Three times: morning, noon, late afternoon) The students must stand in exactly the same spot all three times.

2. After the third time, record the students’ observations. Discuss how the earth turns and changes our position in relation to the sun.
Lesson Three

Producers vs Consumers

Charting Activity on the producers and consumers found in a meadow.

Grade Appropriate: 4
Subject Area: Environmental Education/Science
Outdoor Classroom Area: Meadow, Graph

Objective: Students identify and chart producers and consumers that might be found in a meadow. Students identify and chart producers and consumers actually found in school meadow.

Procedure:

1. Students create chart that lists and identifies producers and consumers that might be found in a meadow.

2. Students go outside and see how many producers and consumers from their chart can be found in the school meadow.
Lesson Four

Where Am I?

Grade Appropriate: 4
Subject Area: Social Studies
Outdoor Classroom Area: U. S. Map

Objective: Students memorize state names and state capital names.

Procedure:

1. Using the U. S. Map on the blacktop outside, play a game of “Where Am I” to reinforce and memorize state/capital names (can be used for reteaching or review).

2. Teacher demonstrates by standing on a state and asking students, “Where Am I?” Students are to give the name of the state, its capital, its abbreviation.

3. Teacher asks for volunteer to pick a state to stand on and have the volunteer pick from the students with raised hands to tell the name, capital, and abbreviation of the state the student is standing on.

4. In pairs or groups of four, have students take turns choosing a state to stand on and quiz others in the group on the state’s name, capital and abbreviation.
Lesson Five

Insects and Worms

Grade Appropriate: PreK - Kindergarten
Subject Area: Environmental Education/Science
Outdoor Classroom Area: Meadow

Objective: Students will identify a variety of insects. Students will identify and understand the importance of the earthworm to growing plants.

Procedure:

1. Read the book In the Tall, Tall Grass to the students.

2. Discuss the characteristics of a variety of insects found locally and how they interact with the environment in which they live.

3. Discuss the characteristics of the earthworm and how it interacts with the environment in which it lives.

4. Discuss the importance of the earthworm to healthy soil production.

5. Visit the meadow to find earthworms and insects in their natural environment and experience the insect life discussed in the book.
Lesson Six

Pond Life

Grade Appropriate: PreK - Kindergarten
Subject Area: Environmental Education/Science
Outdoor Classroom Area: Pond

Objective: Students are introduced to life in a pond. Students are able to identify: fish, frogs, ducks and turtles.

Procedure:

1. Read books about pond life:
   a. The Wide-Mouthed Frog
   b. Fishing at Long Pond
   c. Box Turtle at Long Pond
   d. Life in the Pond
   e. About Fish

2. Discuss with students the life cycle of a frog (add an aquarium to the room with tadpoles – have students check their growth progress and discuss the changes that they see). Bring in real frogs and frog eggs for the science table.

3. Teach students songs about fish, frogs, ducks and turtles.

4. Create a mini-pond for the hallway.

5. Make turtles, ducks, fish and frogs out of construction paper to hang from the ceiling or on walls/bulletin board.

6. Create a play pond, fishing poles and a campsite in the creative drama center.

7. As a culminating activity, students visit the school pond and look for fish and frogs.
Lesson Seven

Living and Non

Grade Appropriate: Kindergarten
Subject Area: Science
Outdoor Classroom Area: Grass/Meadow

Objective: Students will learn the characteristics of living and nonliving things.
Students will be able to categorize items into living and nonliving groups.

Procedure:

1. Discuss with students what makes some things living and others nonliving. (eat, grow, move, breath, and reproduce – explain that plants take up nutrients).
2. Read the poem *Is It Living?* Have students clap their hands once when you read a line in the poem that states a living thing, stamp their feet once for a nonliving thing.
3. Show a picture of people and animals engaging in indoor activities. Ask, “What living things do you see in the indoor picture? Nonliving? How do you know if it is living or nonliving?”
4. Show a picture of people and animals engaging in outdoor activities. Ask, “What living things do you see in the outdoor picture? Nonliving?” How do you know if it is living or nonliving?”
5. Review characteristics of living things.
6. Game “Is it Living or Nonliving?” Students stand if the item I say is living, they sit if the item is nonliving.
7. Go outdoors to a grassy area. Give students 5-10 minutes to explore. Call them back to a circle on the grass. Have students discuss the living and nonliving things they saw. Have them explain why the item is living or nonliving.
8. Either back indoors or while you are still outside, have students help make a “T Chart” listing the living and nonliving things they observed.

*Is It Living?*

Listen closely to my list and play a song that can’t be beat.
If it’s living, clap you hands once, if it isn’t, stamp your feet.
A little puppy? A box of crayons? How about a big tall tree?
Your brand new shoes? The chair you sit on? Or a buzzing little bee?
A pretty flower? A clock that’s ticking? A squirrel high up in a tree?
A bag of marbles? A little piglet? Other kids like you and me?
Language Development (Finger Play)
Share this finger play. Talk with students about how the bunny eats and moves.

Once I saw a bunny *(Extend index and middle fingers of one hand upward.)*
And a green, green cabbage head. *(Ball other hand into a fist.)*
“I think I’ll have some cabbage,” The little bunny said.
So he nibbled and he nibbled, *(Make bobbing motion with first hand.)*
And he perked his ears to say, *(Extend index and middle fingers upward.)*
“Now I think it’s time I should be hopping on my way.”

Language Development (Action Rhyme)
Share this action rhyme and invite children to act like scarecrows. Explain that a stile is a fence.

The scarecrow stands, *(Child stands.)*
With hanging hands, *(Stand with outstretched arms and hands hanging.)*
Beside the farmer’s stile.
He scares the jay and crow away *(Step in place.)*
With just a painted smile. *(Stand with arms outstretched and a happy grin.)*
Lesson Eight

Needs of Plants

Grade Appropriate: Kindergarten
Subject Area: Environmental Education/Science
Outdoor Classroom Area: Grass/Meadow

Objective: Students will list and explain the basic needs of plants.

Procedure:

1. two weeks before the lesson get five similar small, leafy plants. Keep one as a control, put Vaseline on leaves of one, place one plant in a dark drawer or closet, give another plant no water, and remove the soil from the fourth plant. Have students predict what might happen to each plant.

2. After two weeks have students examine the five plants and make observations about each plant and what was the cause of each change.

3. Introduce the five basic needs of plants (water, air, soil, sun, and room to grow). Ask students, “What was missing for each plant in the experiment?”

4. Sing the action song This Is the Way We Dig in the Soil (to the tune of Here We Go Round the Mulberry Bush) to reinforce needs of plants:
   This is the way we dig in the soil, *(Dig holes in the soil-hand action)*
   Dig in the soil, dig in the soil,
   This is the way we dig in the soil,
   Then we plant the seeds. *(Plant seeds-planting action)*
   This is the way the seedlings sprout,
   When God sends the rain *(Crouch and rise slowly as if a seed sprouting)*
   This is the way the young plants grow,
   Reaching toward the sun. *(Continue to rise and extend arms toward sun)*
   Now its time to pick the beans *(Pick beans growing on bean plants-picking action)*
   And we have food to eat! *(Eat food with great relish-eating action)*

5. Take a walk outside to look at the plants in our area. Ask students, “How are their needs met? Does someone take care of them? Can we do it alone? We can take care of some plants, but not all the plants in the world. God takes care of those plants people don’t care for. How?”

6. Using the “Build A Tree” page, explain to students that they will color the picture of the tree and the pictures of the things that trees need. When they are done coloring, they should follow the dotted lines to cut out the tree. They will also cut out the things the tree needs. After your explanations are complete, distribute the student pages and allow the class time to work.

7. Make individual booklets using the “Recipe for a Plant” pages. Have students color, cut and staple.
Lesson Nine

Environmental Barometer

see Project WILD
pages 77 & 78
Lesson Ten

Habitrekking

see Project WILD
pages 79 & 80
Lesson Eleven

Erosion

Grade Appropriate: 2
Subject Area: Science
Outdoor Classroom Area: all/any

*The purpose of these activities is to increase student awareness to the point where they can make intelligent decisions on proper land use.

Objective: Students will be able to:

1. Identify the different types of erosion.
2. Identify the effect of ice on land.
3. Identify the effect of wind on land.
4. Identify the effect of water on landforms.

Procedure:
2. Windblown Deposits: Collect the following: newspaper, dry sand in a jar with lid, box lid, spoon, water, paper, and pencil. Place the box lid on the center of the paper. Remove the lid from the sand and place it inside the box lid near the center. Blow gently on the sand, increase the strength of your breath until sand is being thrown from the lid. Continue blowing for 5 to 10 seconds at this rate. Examine the material in the paper by rubbing your finger over it. Do the same to the material trapped in the box lid. Ask students, “Which is finer? Why?”
3. Water Weight Erosion: Ask students, “How does the weight of water affect the earth?” Outdoors, have students find a spot of bare dry earth. Next have them pour a cupful of water on it. Repeat on the same spot, but this time hold the cup up as high as possible as you pour. Have students observe and then ask, “How did the earth change when the first cupful of water was poured? How did it change when the second cupful of water was poured from a greater height? Can you relate this difference in effect to changes caused by the weight of water on various landforms?”
4. Glaciers and Erosion: Ask students, “How does the movement of glaciers cause erosion?” Take an empty milk carton (after you drink your milk at lunch), rinse it out and fill almost to top with water. Put it in a freezer overnight. Remove the block. Peel off the cardboard and rub over some clay. Ask students, “What did the block of ice feel like? What happened when you rubbed it over clay? How can you relate this to glaciers?”
5. Glacial Erosion: Collect the following materials: ice cube, sand (about 1 spoonful), modeling clay, paper towel, pencil, and paper. Press the ice cube
lightly on the flat surface of the modeling clay. Move it back and forth several
times. Ask students, “Does anything happen to the clay? To the ice?” Place a
small pile of sand on the surface of the clay. Place the ice cube over the sand on
the clay. Let it sit for about one minute. Pick up the ice cube and look at the
surface that had been on the sand. Have students describe what they see. Place
the ice cube back in the same position and move the ice back and forth on the
sandy surface of the clay a few times. Remove the ice cube and gently wipe the
excess sand off the surface of the clay. Have students describe the surface of the
clay when it was rubbed by the sand and ice. Ask, “How would this compare
with the surface of the land when rock and other materials are dragged over it by a
glacier?”

6. Landslides: Ask students, “Why do hills and mountains that seem very solid in
dry weather develop major landslides after prolonged rains?” Build a sand castle.
After you have it shaped firmly, pour some water on it. Pour the water slowly and
gently. Keep pouring until the sand can absorb no more water. Ask, “What
happened at first: What happened finally? How can you compare this to rainfall
and its effect on hills and mountains?”

Tying it all together: The natural process of erosion works slowly but surely. In
hundreds of thousands of years, erosion can wear away a mountain until it is level
with the plain. The more that students know about the causes and preventions of
erosion, the more they can do to wisely use the land and not destroy and/or misuse it.
Lesson Twelve

Everybody Needs a Home

see Project WILD
pages 59 & 60
Lesson Thirteen

Let’s Go Exploring

Grade Appropriate: Kindergarten
Subject Area: Environmental Education/Science
Outdoor Classroom Area: School yard/CA VOC

Objective: Students will be able to recognize the types and places of various insect and animal homes/habitats.

Procedure:
1. Tell students that there are different types of homes/habitats in which insects and animals live. Example: the snail carries his home on his back.
2. Ask students if they can think of other animals or insects that live in their own shells. Example: turtle. Ask: What kinds of animals/insects live in the north woods? What are their homes like?
3. Show students pictures of different animals/insects that you have. Have other pictures of animal/insect homes. Explain that animal/insect homes should never be disturbed. It is dangerous to bother resting animals or animals with babies. Explain that animals have a right to live peacefully just like people.
4. Ask students to name an animal/insect (squirrel/ant) and find its home on the chart (tree/ant hill) and then name the home.
5. Enrichment: as an outside activity, give the students a paper with a picture of the different animals/insects discussed in class. Have the students search for the animal/insect homes outside and put an X on the animal/insect that belongs to that home. Examples: ant – ant hill; bird – nest; spider – web; rabbit – burrow; squirrel – nest in tree; and beaver – lodge.
Lesson Fourteen

Up in a Tree

Grade Appropriate: Kindergarten
Subject Area: Science
Outdoor Classroom Area: Sister’s Yard

Objective: Students will be able to identify the parts of a tree and the elements needed to grow and live.

Procedure:
1. Display a chart of a tree. Explain while a tree is growing above the ground, it is also growing below the ground. The part above the ground is called a trunk and it may have many branches. Roots grow underground to help make the tree strong and sturdy.
   a. A tree needs air to become big and beautiful. It uses the leaves and the many cracks in its branches to breathe.
   b. A tree gets thirsty and needs water to drink. The tree roots get water from the soil and then the tree grows taller.
   c. You can discover how old a tree is by measuring its trunk with a tape measure. Usually a tree grows one inch bigger around each year. So, if a tree trunk measurement is 15 inches around, we have an idea that it is older than a slimmer tree of the same species. Some tree species grow slower than others; make sure the students are looking at the same species of trees when they compare them.
   d. Enrichment: Go outside and look up at the trees. Notice how some trees are taller and bigger than others. Some even have fruit or nuts. And, some are used as homes to birds and other animals. Have the students point to and name the different parts of a tree. Measure a tree.
OBJECTIVES
Upon completion of this lesson, students will be able to:
• Observe various features of trees.
• Draw these tree parts: trunk, crown, and roots.
• Draw a picture of a tree’s basic needs: nutrients, sunlight, space, air, and water.

SUBJECT AREAS
Arts, Science

LESSON/ACTIVITY TIME
• Total Lesson Time: 55 minutes
• Time Breakdown:
  Introduction .............. 10 minutes
  Activity .................. 30 minutes
  Conclusion .............. 15 minutes

TEACHING SITE
Schoolyard, park, or forest with enough trees that each student or pair of students can adopt one as their own.

CLASSROOM LESSON CONNECTIONS
This lesson enhances Classroom Lesson 1, Tree Hardware.

In this lesson, students record their observations and draw an adopted tree. Students then share information about their trees and create a class scrapbook.

BACKGROUND INFORMATION
Just like people, every tree is different. Even two trees of the same age and species planted right next to each other take on individual characteristics. Although their general growth pattern might be similar, each tree has its own fingerprint, so to speak. In addition, environmental factors like insects chewing on leaves and birds building nests can add to the differences.

There are several things about all trees that are similar, no matter the species, age, or growing site. All trees have the same basic needs. Trees need nutrients from the soil in order to grow and reproduce. Air is necessary for trees to get the carbon dioxide they use in photosynthesis. Trees also need energy from the sun to complete the process of photosynthesis. In photosynthesis, trees use the sun’s energy to convert carbon dioxide and water into sugars and oxygen. Besides aiding in photosynthesis, water aids in the transportation of nutrients up and down the trunk. Space is also one of the tree’s basic needs. Root systems need room to grow, as do branches, leaves, and trunks.

Another thing that makes all trees similar is their three basic parts: trunk, crown, and roots. The trunk, or stem, provides support for the branches and leaves. It also acts as a transportation connection between the leaves and roots. The leafy crown is where photosynthesis takes place. A tree's unseen root system may spread out even farther than the crown of the tree. Large roots anchor the tree, store sugar, and serve as a path for nutrients and water to reach the rest of the tree. Small roots that grow from the large roots absorb water and nutrients from the soil.
VOCABULARY

Crown: The part of a tree with live branches and leaves.

Nutrients: The things in the soil that a tree needs to live and grow.

Roots: The part of a tree that works underground to get water and nutrients for a tree to use.

Space: The area that a living thing needs to grow.

Trunk: The part of a tree that the crown grows on and connects the crown to the roots (often called the stem).

PROCEDURE

1. Take your group on a short walk outside to take a closer look at some trees. Try to find dead trees and living trees, old trees and young trees. Allow students time to get a close look at several different trees.

2. Stop at one tree and point out the trunk, crown, and roots of the tree.

3. At another tree, discuss what trees need to survive: nutrients, sunlight, space, air, and water. (Nutrients come from the soil and help the tree grow. Sunlight is where trees get energy that they make into food. Space is needed so trees can grow and spread their roots and branches. Air is needed for the tree to get carbon dioxide. Water is needed for trees to make food and to transport nutrients in the tree.)

MATERIALS LIST

FOR EACH STUDENT
- Student Pages 1-2, All About My Tree
- Several crayons
- Clipboard or notebook to use as a writing surface

FOR EVERY 3 TO 4 STUDENTS
- Art paper
- Paints
- Pocket folder with three clasps in spine

FOR THE CLASS
- Three-ring binder

FOR THE TEACHER
- Three-hole punch

TEACHER PREPARATION

- Visit the teaching site to be sure there are enough trees for each student or pair of students to adopt one. In addition, locate as many of the following as possible:
  - Dead trees
  - Living trees
  - Young trees
  - Old trees
- Copy Student Pages 1-2, All About My Tree and three-hole-punch them.

SAFETY PRECAUTIONS

Visit the teaching site ahead of time to locate any hazards such as hanging branches, protruding tree roots, holes, poison ivy, stinging nettle. Encourage students to walk, not run, at all times when in a forested area.

4. Explain that each student (or pair of students) will adopt a tree. Students should record special information about their tree on a worksheet. Later, the worksheets will be put together to make a class scrapbook about their adopted trees.
ACTIVITY

1. Help match each student or pair of students with one tree that they can adopt as their own.

2. Give each student Student Pages 1-2, All About My Tree, a clipboard or notebook to use as a writing surface, and several crayons. (Even if two students are adopting one tree, each student will still fill out a worksheet.) Guide them through the following activities on their Student Page:
   - Using the space on the worksheet, draw a picture of your tree, including the trunk, crown, and how the roots might look underground. Be sure to notice leaf shape, bark color, etc. Draw an arrow from the word “crown” in the left column to the crown of your tree. Do the same for the trunk and roots.
   - Circle the picture on the worksheet that reminds you of how big your tree is.
   - Do any animals live on or near your tree? Look carefully on the ground around your tree, on the bark, branches, and leaves of your tree. Circle all the animals on the worksheet that you found on or near your tree.
   - Use the space on the worksheet to draw what your tree needs to survive (nutrients, sunlight, space, and water).
   - Look at the shape of your tree’s crown. Circle the picture on your worksheet that reminds you of the shape of your tree.

CONCLUSION

1. Take your students back to the classroom. If necessary, give them a few minutes to finish drawing and writing about their trees.

2. Ask students to share with the group one special thing about their tree. Review what trees need to survive: nutrients, sunlight, space, air, and water. Review the three basic parts of a tree: trunk, crown, and roots.

3. Put your worksheets together in the three-ring binder to make one class scrapbook.

EXTENSIONS

Optional Ideas

You may want to have students create a journal page about their tree.

- Listen to your tree. Does it make any sounds? Write or draw about the sounds that you hear on a piece of paper.
- Look at your tree from different angles: lie on the ground underneath your tree and look up at the branches, look at your tree from far away, sit with your back to your tree and look at your tree’s surroundings, stand very close to your tree and take a careful look. Draw a picture of your tree from one of these new angles.
- Carefully collect something from your tree that’s already on the ground: leaf, seed, twig, soil, or small piece of bark. Add it to your scrapbook.
- Make a leaf and/or bark rubbing with crayons.
- Make a leaf print with paint.
- Dip a twig in paint and paint a picture.

Seasonal Ideas

You may decide to make seasonal visits to your adopted trees. In this case, each student can create their own scrapbook about their tree.

- Draw a picture of how your tree looks this season and include the surroundings. Be sure to notice how the tree’s shadow looks different at different times of the day or year.
- Are any new animals living on or near your tree? Look carefully on the ground around your tree, as well as on the bark, branches, and leaves of your tree. Draw pictures of the animals you see this season.
RECOMMENDED RESOURCES

BOOK

The Giving Tree by Shel Silverstein. (New York: Harper & Row, 1964.) This classic story tells of a boy's use of a tree as he grows from a young boy to an old man.
Lesson Sixteen

Learning to Look, Looking to See

see Project WILD
pages 278 & 279
Lesson Seventeen

God’s Goodness in Creation

Grade Appropriate: 1st Grade
Subject Area: Religion
Outdoor Classroom Area: all/any

Objective: Students will:
  o Experience joy and gratitude in discovering gifts of creation
  o Understand that our natural resources require care to preserve them
  o Show a willingness to accept responsibility to help care for our world

Materials:
  1. Display table with a sign that reads *God is Good* (for use with outdoor walk)
  2. Crayons or markers

Procedure:

1. Explain: God has made us stewards over the natural resources of the earth. As Christians we are responsible for our planet, not only for our own well-being, but also for people all over the world and generations yet to come.
2. Outdoor Walk: Give directions so that there is sufficient order and quiet for the students to be free to enjoy nature. Announce the starting and stopping signals and tell students to stay together or walk in pairs.
   a. Say: Today we will do something very special. We will take a walk outside so that we can see the signs of God’s goodness all around us in the beautiful things God has created. We’ll walk slowly and take time to see the blueness of God’s sky and the greenness of God’s grass. We will stop and listen for a bird singing so that we can enjoy the song that God has given it. All of the things God has made speak to us in some way. Do you know what they say? They say, “How good God is!” or “I love you!”
3. The students will sense your own delight in and reverence for creation. Comment on the blue sky and green grass, leading the students to see what they might take for granted. You may have students raise a hand when they see something beautiful or special that God has made. After the student tells about it, all of the students could respond together, “How good God is.”
4. Discussion (either outside in sister’s yard, in meadow, or in class after walk):
   a. God created our good and beautiful world for everyone. All the gifts in it belong to everyone. God wants us to work together to take care of our world.
b. Did you see anything (do you see anything) outside that was not good or beautiful? Example: damaged buildings, papers and trash on the playground.

c. Our rivers and lakes and the living things in them are being destroyed by pollution something that dirties or spoils nature. Much of our water is no longer pure. Exhaust from cars and smoke from factories pollute our air. Animals, such as seals, whales, lions, elephants, and certain kinds of birds are disappearing from the world because people kill them for their own needs or enjoyment.

d. Ask: How do you feel about these problems?

e. Do you think you should wait until you grow up to start taking care of the world? Why? Why not? In what ways can you help take care of our world?

f. Think of something God made that is in danger of being lost because we are not caring for it properly (fresh air, clean water, trees, grass, birds, fish, seals). If that creation is lost, how would it hurt the rest of the world?
Natural Numbers Challenge

Look at this number pattern. It is called the Fibonacci sequence.

\[
\begin{array}{cccccccc}
0+1 & 1+2 & 2+3 & 3+5 & 5+8 & 8+13 & 13+21 & 21+34 & 34+55 \\
1 & 3 & 5 & 8 & 13 & 21 & 34 & 55 & 89 \\
\end{array}
\]

Find out all you can about the mathematician who discovered the pattern.

Some of the most beautiful shapes in nature contain numbers that are in the Fibonacci sequence. They are waiting for you to discover them!

Find a pine cone. Look carefully at the arrangement of the spirals. One set of spirals is in a clockwise direction and the other is anti-clockwise. Count each set. You should be able to find five and eight, numbers which are in the Fibonacci sequence.

Take a magnifying glass and go outside into the school grounds.

Find a daisy and look at the centre of it. It is composed of tiny florets. You will find that, like the pine cone, the florets are arranged in opposite sets of spirals. Count the spirals and see what you find.

Now look at the leaves of plants. Can you see any patterns in the way they grow round the stems? If you look hard enough you will find more Fibonacci numbers.

It is an exciting moment when you first find out how much numbers are a part of the natural world. Happy hunting!
Biggest and Smallest Challenge

Can you find the longest or shortest, the widest or narrowest, the heaviest or lightest ... ?

- The lightest piece of litter
- The heaviest stone
- The shortest route to the pond
- The widest flower bed
- The thickest piece of wood
- The narrowest gate
- The longest wall in the school
Shapes, Lines and Angles Challenge

Walk around the grounds of your school and try to complete this chart.

<table>
<thead>
<tr>
<th>Where can you see...?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A right angle</td>
</tr>
<tr>
<td>An acute angle</td>
</tr>
<tr>
<td>An obtuse angle</td>
</tr>
<tr>
<td>An exterior angle</td>
</tr>
<tr>
<td>An interior angle</td>
</tr>
<tr>
<td>A vertical line</td>
</tr>
<tr>
<td>A horizontal line</td>
</tr>
<tr>
<td>Parallel lines</td>
</tr>
<tr>
<td>A diagonal line</td>
</tr>
<tr>
<td>A curved line</td>
</tr>
<tr>
<td>An irregular shape</td>
</tr>
<tr>
<td>A regular shape</td>
</tr>
<tr>
<td>A hexagon</td>
</tr>
<tr>
<td>An ovoid</td>
</tr>
</tbody>
</table>

Can you make up a shape quiz for the rest of your class, based on what you have seen?
Games Outside Challenge

Can you devise and conduct a survey during playtimes and the lunch hour to discover how many different kinds of games are being played and which are the most popular?

Here are some headings to get you started. Perhaps you can think of others to add to the list.

- Ring games
- Chase games
- Ball games
- ‘Let’s pretend’ games

See if you can find out:

1. Which game is the most popular with each of the year groups that we have in school?
2. What size of group do most children play in?
3. Are there more single-sex groups or more mixed groups?
4. Do most people stick to just one game at playtime or do they play two or three different ones? Is it the same at lunchtime?

Think carefully about how you will present the information you obtain. Is there a computer program which might help you?
Lesson Nineteen

Hooks and Ladders

see Project WILD
starting on page 43
Lesson Twenty

Urban Nature Search

see Project WILD
starting on page 70
LESSON 1
Me as a Tree

BIG IDEAS
• A tree is a perennial plant (lives more than one growing season) with a well-defined woody stem, crown, and roots. (Subconcept 6)
• Trees compete for nutrients, sunlight, space, and water. (Subconcept 7)
• Trees have life stages that include germination, growth, maturity, reproduction, decline, and death. (Subconcept 8)
• As part of the forest community, trees have various roles (e.g., providing habitat, holding soil). The presence of trees alters the surrounding environment. (Subconcept 9)

OBJECTIVES
Upon completion of this lesson, students will be able to:
• Draw and explain the parts of a tree and their functions.
• Compile a list of basic needs of a tree.
• Explain that trees compete for their basic needs.
• Illustrate and explain the life stages of a tree.
• Differentiate functions of a tree in a forest community.

SUBJECT AREAS
Arts, Science, Social Studies

LESSON/ACTIVITY TIME
• Total Lesson Time: 135 minutes
• Time Breakdown:
  - Introduction .......... 10 minutes
  - Activity 1 ............ 30 minutes
  - Activity 2 ............ 30 minutes
  - Activity 3 ............ 30 minutes
  - Activity 4 ............ 20 minutes
  - Conclusion .......... 15 minutes

TEACHING SITE
Classroom - Outside - Use trees

FIELD ENHANCEMENT CONNECTIONS
This lesson closely ties with Field Enhancement 3, Competition in a Forest.
**VOCABULARY**

**Bark:** The outermost layer on a tree’s trunk that protects the tree from injury.

**Cambium:** The growing part of the trunk of a tree. This thin layer between the xylem and phloem produces cells that become new xylem and phloem.

**Competition:** The struggle that exists among plants or trees to acquire resources from a limited pool.

**Decline:** The part of a tree’s life when it becomes less healthy and does not recover.

**Germination:** The beginning growth of a seed when roots and stem sprout.

**Heartwood:** The central core of a tree made of dense, dead wood. The heartwood provides strength for the tree.

**Maturity:** The part of a tree’s life when noticeable growth slows and it can begin reproduction.

**Phloem:** The layer in the trunk of a tree that carries sugars (food energy) created during photosynthesis from the leaves to the rest of the tree. Phloem is also called inner bark.

**Reproduction:** The part of a tree’s life when it produces seeds.

**Transpiration:** The evaporation of water from plants.

**Xylem:** The layer in the trunk of a tree that carries water and nutrients absorbed from the soil by the roots to the leaves. It is located between the heartwood and the cambium layer.

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**MATERIALS LIST**

**FOR EACH STUDENT**

- Copy of Student Page 1, *Trees and Humans*
- Copy of Student Page 2, *Inside a Tree*
- Copy of Student Page 3, *Life Stages Picture Cards*
- Copy of Student Page 4, *Trees’ Roles* (optional)
- Crayons or colored pencils
- Scissors

**FOR THE TEACHER**

- Chalk/marker board
- Overhead transparency markers
- Overhead transparencies of:
  - Student Page 1, *Trees and Humans*
  - Student Page 2, *Inside a Tree*
  - Teacher Page 1, *Basic Needs of Trees and Humans*
  - Teacher Page 2, *Life Stages of a Human/Life Stages of a Tree*
  - Student Page 4, *Trees’ Roles* (optional)
- Teacher Key 1, *Trees and Humans Key*
- Teacher Key 2, *Inside a Tree Key*
- Teacher Key 3, *Basic Needs of Trees and Humans Key*
- Teacher Page 3, *Tree Trivia Questions*

**TEACHER PREPARATION**

Phloem carries sugars (food energy) created during photosynthesis from the leaves to the rest of the tree. The word comes from the Greek *phloos* which means “bark.”

**Bark** is the outermost layer that protects the tree from injury.

**CROWN**
The crown of a tree is composed of leaves and branches. It is where photosynthesis takes place. Leaves gather energy from sunlight and carbon dioxide from the air, and then combine them with water. Photosynthesis is the process trees use to make sugars, the energy for tree growth. The food energy created by the leaves in the crown is stored in the branches, trunk, and roots.

**ROOTS**
A tree’s unseen root system may have more mass than the visible top portion of the tree. A tree’s roots usually grow even farther out from the trunk than its branches. They lie just below the surface of the ground in the top nine inches of the soil. The structure of a root system is complex. Root systems consist of large, woody roots that grow out from the trunk and huge numbers of small roots growing out from the large ones. The large roots serve as anchors to keep the tree standing, provide energy storage for times when the tree isn’t making sugars, and gather nutrients and water for the rest of the tree. The small roots that grow from the large roots are responsible for absorbing water and nutrients from the soil.

**SUNLIGHT**
Sunlight is the form of energy that trees use to complete the process of photosynthesis. In order for trees to convert carbon dioxide and water into sugars (and other carbohydrates), they need energy from the sun.

**WATER**
Water is key to photosynthesis. Water is also important to the tree for transportation of nutrients. It’s water that makes up most of the tree’s sap. Sap carries nutrients up the trunk and food back down to the roots.

**AIR**
All plants need air to survive. It is from the air that plants get the carbon dioxide for photosynthesis. Without air in the soil, roots would “drown.”

**SPACE**
Space is the least tangible of the basic needs. It is important for students to know that trees can’t grow to their potential when they are crowded. Root systems need room to grow, as do branches, leaves, and stems.

**THE LIFE OF A TREE**
The life of a tree can be divided into six stages: germination, growth, maturity, reproduction, decline, and death.

The first stage of a tree’s life begins with a seed. When a seed has the right temperature, moisture, and soil, it will germinate (sprout). Out of the seed comes a young tree called a seedling.

The seedling that emerged during germination will continue its life through growth and then on to maturity. A mature tree is capable of reproduction. Many tree species are capable of living for many generations of human life; their lives are much longer than ours. A tree can be mature and reproductive for many years.
Eventually a tree will move on to a part in its life called decline. Decline can be a result of old age or some other factor like disease, insect damage, or storm damage. Decline in the health of a tree will lead, someday, to the death of that tree. A dead tree is still a part of the nutrient cycle for its community. A dead tree contributes to other plant, animal, and insect life, as the tree's remains are recycled into the soil. Dead trees also serve as homes for birds, squirrels, and other wildlife.

**COMPETITION**

Competition occurs when two or more individuals attempt to use a resource that meets their basic needs. Animals compete for things like food and shelter. Plants create their own food so they don't compete for it, but they do compete for water, space, sunlight, and nutrients. When the resources that supply basic needs for plants or animals are abundant, there is little competition. When those resources are not readily available, both plants and animals compete. For example, there is little competition for sunlight in an open area with a few trees. However, if there are many trees in an area, they will compete with each other to grow tall enough to collect more sunlight. Competition can occur among individuals within a population or between different species.

**FUNCTIONS IN COMMUNITY AND ALTERING OF ENVIRONMENT**

Trees have various functions in their community. They absorb carbon dioxide and produce oxygen during photosynthesis. Since many trees live for a long time, they act as "carbon sinks" to store carbon. Another function is transpiration. Trees absorb water from the soil and release water vapor into the atmosphere. Trees also provide habitat for animals and plants in their branches and in hollows in their trunks. The seeds, leaves, and bark of trees are also used as food by animals. The many roots of trees help hold soil and prevent erosion.

It's easy to see how people alter the environment, but trees can alter the environment too. The shade a tree casts will determine what plants are able to live beneath it. If a tree has dense shade, sun-loving plants will not grow under it. In turn, animals that rely on sun-loving plants will be absent as well. That same shade will also change the temperature in the community. Trees impact the moisture content of the soil, which also changes the types of plants able to grow there. Some trees have the ability to give off chemicals that discourage other plants from living near them. Black walnut is an example of a tree in Wisconsin that can control other species with chemicals.

**PROCEDURE**

**INTRODUCTION**

1. Begin by showing students pictures of trees or observing actual trees in the schoolyard. Ask students to make comparisons between different trees. (*One tree has dark brown bark and another has light brown; one tree has leaves and another has needles, etc.*)

2. Next, ask students to compare trees with people and provide examples of what they have in common and why. (*Accept any reasonable responses. People have legs and arms, and trees have branches.*) Ask what makes trees and people different. (*Trees can't move; trees have green leaves, etc., again accepting reasonable answers.*)

3. Explain that, in the next activities, students will be comparing trees and humans.

**ACTIVITY 1**

1. Tell students that they will be comparing the parts of a tree to the parts of a human and discussing how these parts have similar functions. Display the overhead transparency of the Student Page 1, *Trees and Humans*, and distribute a copy of the page to each student.
2. Explain that all of the choices for the parts are listed at the bottom of the page and students should write them in the blanks. Each numbered part on the tree diagram corresponds with a numbered part on the human diagram with a similar function. The functions are listed on the left side of the page as clues to determining what the parts are.

3. Once students have completed their worksheets, have them help you fill in the blanks on the overhead transparency. As you fill in each pair of numbers, explain more about the function that corresponds with the number. (See Teacher Key Wst1, Trees and Humans Key.)

4. After completing discussion of Student Page 1, Trees and Humans, point out that just as veins and arteries in humans have specialized jobs (veins transport blood containing waste and arteries transport blood containing oxygen), the xylem and phloem in a tree have specialized jobs, too.

5. Display the overhead transparency of Student Page 2, Inside a Tree, and hand out a copy of the page to each student. Tell students that the job of xylem, phloem, and other layers of a tree are described on this handout. Have students read the description of the tree layers and write the answers in the blanks.

6. When students are finished, ask volunteers for their answers and write them on the overhead. (See Teacher Key Wst2, Inside a Tree Key.)

**EXTENSION:** Weave forestry education throughout your curriculum and strengthen language arts skills by having students journal their thoughts. After each activity, assign students to make journal entries that relate to the activity. Prompt them with questions to answer. For example: Assign students to write a one-page journal entry of their life as if they were a tree. They should describe the important tree features and what those features do.

**ACTIVITY 2**

1. Explain to students that trees and humans both have basic needs. Basic needs are things that an organism must have in order to survive. Display the overhead transparency of Teacher Page Wst1, Basic Needs of Trees and Humans. Ask students what the basic needs of a human are. Fill in their answers on the overhead in the triangle chart titled "Basic Needs of a Human." (See Teacher Key Wst3, Basic Needs of Trees and Humans Key.) Explain why nutrients and sunlight are not basic needs of humans if those answers are given. (Although people need nutrients, we get those things from food, which is a basic need. Sunlight provides us with vitamin D but it is not the only source. Nutrients and sunlight become secondary to the basic need for food.)

2. Ask students what the basic needs of a tree are and fill in their answers on the overhead in the triangle chart titled "Basic Needs of a Tree." (See Teacher Key Wst3, Basic Needs of Trees and Humans Key.) Explain why things like food and shelter are not basic needs of trees if those answers are given. (Trees create their own food and don't need shelter.)

3. Ask students to make comparisons between the two and write the similarities on the third triangle.
4. Make two headings on the board: "Trees" and "Humans." Tell students they are going to list the basic needs that trees or humans compete for. Define competition if needed. Have students study the triangle charts that show the basic needs of a human and of a tree. Ask students which of these things humans or trees compete for. Remind students that trees are not mobile like humans. They cannot move to a new area if something is lacking. Write students' ideas on the board. (The tree list should include nutrients, sunlight, water, and space. All of these can be limiting to a tree's growth because they are not always in abundance. Air is plentiful and does not need to be competed for. The human list may contain food, water, and space. Depending on the type of society a person lives in, these items may not be in abundance.)

NOTE: Cover the bottom portion of the transparency until students brainstorm the life stages of a tree in the next step.

5. Pass out one copy of Student Page 3, Life Stages Picture Cards, to each pair of students. Have students cut apart the squares and draw and color each life stage of a tree and of a human. Remind students that pictures must be classroom appropriate and easily understood by others. When students are finished, collect the two sets of cards from each group. NOTE: This portion of the activity could be given as homework.

4. Next students will be playing a game called PIT using the Life Stages Picture Cards they created.

Directions for PIT:
a. Make sure that you have a complete set of human and tree life stage cards for each pair of students.
b. Shuffle all the human and tree life stage cards the class created.
c. Designate an area in the center of the room to be the PIT.
d. Pass out any 12 cards to each group.
e. Explain that when you say "GO," each group is to put the cards in the correct order of the life stages of a tree and human. Each group will try to complete two separate life stage sets, one for the tree and one for the human.
f. If a group has doubles of a card, they need to go to the PIT area to exchange their duplicate card(s) with someone from another group. They may only trade with a group that has the same number of cards to trade. (If a group has three cards, they can only trade with another group with three cards. If no one at the PIT has the same number, they must wait until someone with three cards comes to the PIT.) They may not look at the card(s) being traded until they return back to their partner.
g. The first group to create both a human and tree life stage set wins.

5. After you have a winner, give all the groups time to create complete human and tree life stages. Go through the correct answers.
ACTIVITY 4

1. Have students brainstorm their roles in the school community. (Possible answers include: act as a role model to younger students, be a friend to others, be a good student – listen, etc., fill school responsibilities – hall monitor, cafeteria, patrol, etc.) Also, have students brainstorm a list of the roles others in the school play. (Janitor, teacher, cook, principal.)

2. Hand out Student Page 4, Trees' Roles, or use it as an overhead. Explain that the picture shows examples of many roles trees have in the forest community. Have students study the picture and determine as many of these roles as possible. Make a list of the trees' roles on the board. (Provide food, provide habitat, prevent erosion by holding soil, provide shade, produce oxygen.)

3. Have students think back to the roles they and the other people they listed play in the school community. Ask them what they think might happen if these roles weren't filled. (If they were not good students, their grades would go down and they wouldn't learn. If they did not fill school responsibilities, someone else would have to do them or no one would do them and the school would run less smoothly, be less safe, etc. If the teachers weren't there, the students wouldn't learn. If the janitor wasn't there, the garbage would pile up and the halls wouldn't be swept.) Now ask what they think might happen if trees did not fill their roles in the forest community. (The animals would not have food or shelter. Water sources would become polluted and dirty. There would be less oxygen in the air. There would be less shade.)

CONCLUSION

1. Finish the lesson with a game of tree trivia. Tell students they will need to draw from all the information they learned while comparing trees and humans to answer the questions.

2. Divide the class into four teams. Let each team choose a tree name or assign them a name and write it on the board.

3. Explain the rules.
   a. The first team will be asked a question. (See Teacher Page 3, Tree Trivia Questions.)
   b. They are allowed only one answer. The group should discuss their final answer before giving it to you.
   c. If they answer correctly, they get five points. If they answer incorrectly, the next team has the opportunity to answer the question for three points.
   d. After points have been given for the first question, the second team should be asked the second question, and so on.
   e. Continue asking questions, ensuring each group gets the same number.
   f. The team with the most points at the end wins.

CAREERS

The career profile in this lesson is about Jim Storanl, Tree Nursery Manager, Wisconsin DNR. Career Profile 4A.TNM is found on page 22. Use this profile to enhance the lesson and/or use it with the special careers lesson on page 148.
SUMMATIVE ASSESSMENT
1. Apply understanding of the functions of a tree by having students compare the functions of a tree to another animal or plant.

2. Invent a tree that could survive with a different set of basic needs than the regular tree. What would those basic needs be? Where would this tree live? How could this tree contribute to its community?

REFERENCES


RECOMMENDED RESOURCES

WEB SITE
Talk About Trees
www.talkabouttrees.org/lessons.html
This website is about California trees, but has games and puzzles with general forest information that can be printed. There are interactive word finds and information about forests as well.
Lesson Twenty-two

Graphing

Grade Appropriate: 3rd Grade – 8th Grade
Subject Area: Math/Science/Social Studies
Outdoor Classroom Area: Graph

Objective: Students will create a bar graph on the grid painted on the blacktop area of the school using collected data.

Procedure:
1. Students will collect data in any subject area that can be put into bar graph form.
2. Students will have a large picture of their collected data for all to see.
   a. Drawback: Data will not stand the test of time and nature.
Lesson Twenty-three

Venn It!

Grade Appropriate: 3rd Grade – 8th Grade
Subject Area: Language Arts/Social Studies
Outdoor Classroom Area: Venn Diagram

**Language Arts:**
**Objective:** Students will demonstrate the ability to perform comparison and contrast thought processes using the Venn diagram.

**Procedure:**
1. Using weekly stories: compare and contrast characters, plot, story line, setting, etc. Relate individual books to one another and/or the main text story.

**Social Studies:**
**Objective:** Students will demonstrate the ability to perform comparison and contrast thought processes.

**Procedure:**
1. Compare and contrast why different explorers came to the Americas by asking a series of questions and having the students record responses on the Venn diagram (i.e. What was their purpose? Where did they come from? How successful were they? etc.).
Lesson Twenty-four

Webb It!

Grade Appropriate: 3rd Grade – 8th Grade
Subject Area: Language Arts/Math
Outdoor Classroom Area: Webb Diagram

Language Arts:
Objective: Students will use the webb diagram to organize and list details necessary for successful completion of writing assignments.

Procedure:
1. When writing a paragraph have students use the webb diagram to organize and list details
2. Use the webb diagram to remind students of reading strategies.

Math:
Objective: Students will use the webb diagram when solving story problems or other intricate math problems.

Procedure:
1. When solving story problems or other intricate math problems, students will use the webb diagram to remind them to employ problem-solving strategies.
Lesson Twenty-five

Note Races

Grade Appropriate: 2nd Grade – 6th Grade
Subject Area: Music
Outdoor Classroom Area: Staff and Pipes

Objective: Students will learn to recognize notes on the staff and be able to play the notes on tuned pipes.

Materials: chalk, bean bags, outdoor classroom staff and tuned pvc pipes

Procedure:
1. Review names of lines and spaces in treble and/or bass clef. As students name each line or space, play the corresponding pvc tube.
2. Have two students stand below the staff.
3. Draw the clef sign on the staff using chalk.
4. Place a bean bag on the staff. The students must figure out what note it is and strike the corresponding pvc pipe. Whoever does so first is the winner and stays up.
5. The person who does not get to the pipe first moves the bean bag to a different place on the staff. The next student comes up to challenge the winner. Go through the entire class once per game.
Lesson Twenty-six

Pitch and Letters

Grade Appropriate: K – 3rd Grade
Subject Area: Music
Outdoor Classroom Area: Staff and Pipes

Objective: Using the outdoor classroom staff, students will learn lines, spaces, note names, and pitch and how they work.

Materials: Outdoor classroom staff; note names will use letter cards; pitch will use bean bags; lines and spaces can use letter cards.

Procedure:
Note Names:
1. Review names of lines and spaces.
2. Give each student a card with one letter, A-G printed on it.
3. Have each student place their card on the staff in the correct spot.
4. Review, correct mistakes, repeat.

Pitch:
1. Review pitch, high and low.
2. Give each student a bean bag.
3. Have each place their bean bag on the staff as directed. (High note or low note).
4. Review, correct mistakes, repeat.
5. May have students put their bean bag anywhere, play the tune they create on the tuned pipes, and discuss direction in melody.

Lines and Spaces:
1. Review staff, lines, and spaces.
2. Go through lines in treble/bass clef.
3. Go through spaces in treble/bass clef.
4. Have students stand on either a line or a space or, for older students, place their letter card on the correct line or space.
5. Review, correct mistakes, repeat.
A number snake in the playground can be used for a variety of number activities.

Each day the children have to fathom out the reason for the red outlines which have been put round the numbers by their teacher. Solutions written on a slip of paper are posted in a box. At the end of the day the solutions can be compared and discussed.

• Ratios Work out ratios of children to balls, skipping ropes, any other piece of small games equipment; ratio of children to benches in the playground; ratio of children to bulbs that need planting, sets of forks and trowels, flower tubs.

• Fractions When activities are planned outside try giving the instructions in fractional terms: 1/10 of the class will hunt mini-beasts, 1/3 will do weather recordings, 1/5 will pond dip. How many children are left to do the evaporation experiment?

Look out for opportunities to ask questions such as:
• Do more or less than 1/3 of the children enter school by the side gate?
• Could 1/4 of the class sit on the bench at the same time?
• What fraction of the 100 bulbs we planted has survived the slugs?
• What percentage of the school grounds is laid down to grass?

ALGEBRA ALONGSIDE THE NUMBER
Continual exploration of number patterns and relationships is the foundation that needs to be laid as a sound basis for algebra. If every time children handle numbers they are encouraged to be enthusiastic pattern spotters that in its turn will help them in the search for relationships which lies at the heart of mathematics. Activities which lead to generalization and encourage children to substitute symbols for words promote algebraic understanding. With these principles in mind, some of the tabled activities have an algebra heading. The examples do not extend beyond National Curriculum Level 4 work, since sound teaching in this area will result in children being able to work in symbolic form by this stage.

Working out the ratio of children to games equipment.

A game of marbles helps the children practise using numbers.
Moving Math Outdoors

Real-world math problems invite subject integration and answer that age-old question “When am I ever going to use this?”

by Char Bezanson and Judith Killion

A schoolyard is a convenient setting for many math activities and is especially suited to concept application and problem-solving. Number sense, patterns and relationships, measurement, estimation, geometry, statistics and probability — mathematics is, at its root, a way of describing the world and its patterns. A nature area and the objects and phenomena within it can be estimated, counted, and measured, and the data collected can then be charted, tabled, averaged, graphed, and manipulated in many ways. We might teach fractions or percentages using pizzas or dollars, but these concepts can be extended by having students come up with ways to estimate the fraction of the sky covered by clouds or determine the percentage of their schoolyard that consists of asphalt or of lawn.

One of the best things about using the schoolyard for teaching is that it provides a direct connection to “the real world.” And the real world isn’t neatly divided into subject areas. Any activity done in a natural setting provides an opportunity for students and teachers to “double-dip,” meeting learning objectives in more than one area. A first-grade activity that involves measuring, counting, or sorting leaves may have as its primary objective the development of number sense and other math skills, but it also provides opportunities to observe texture, color, insect interactions, and the unity and diversity of life. Fifth-graders looking for patterns in the angles formed by twigs are fulfilling a geometry objective while simultaneously gaining experience with plant structure that can be built on in a science lesson, or which might inspire a poem or a painting.

In middle and secondary grades, concrete applications of math concepts in a schoolyard setting are especially useful in developing skills in divergent thinking. Middle-schoolers can devise a variety of ways to estimate quantities such as the surface area of a pond, the height of a tree, or the mass of a tree trunk, and determine the “best” solution for the specific problem to be solved. (For example, which method would be best for calculating the biomass, firewood, or board-feet contained in a tree? Which would be most precise? Which would involve the simplest tools?) Applying math skills in these ways helps students develop confidence in their ability to solve problems in other contexts and to design their own scientific investigations. High school students can learn about statistical sampling by documenting the number of species along a transect or in a series of study plots, and thus understand how they might apply such mathematical tools to learning about ecosystem diversity or other related topics.

Standards documents, state and provincial curriculum frameworks, textbooks, and other curriculum
materials often include lessons and illustrations drawn from the real world. Many of these can be adapted to the schoolyard. Since no two schoolyards are the same, this adaptation does require forethought and creativity on the part of teachers. But the increase in student interest, motivation, and learning easily makes this investment of time worthwhile. Some starters are presented here, but once you begin using your outdoor classroom for math you’re sure to come up with many more ideas.

Prairies Have a Lot of Gall

ROUND GALLS THAT MAKE A PLANT look as if it has swallowed a ping-pong ball are common on the stems of Canada goldenrod (Solidago canadensis). The gall is a growth formed by the plant in response to the larva of the goldenrod gall fly, Eurosta solidaginis. In summer, the female fly lays an egg in the unfolded leaves of the plant’s topmost bud. After hatching, the larva tunnels into the growing tip and causes the plant to grow a ball-like deformation, forming a protective home for the hungry, growing larva. If it is lucky, the larva spends the entire winter in this chamber, emerging from the gall in early spring. Often, however, galls are pecked open in winter by chickadees or other hungry birds.

Sampling Activity: Since galls are large, obvious, and stationary, they are easy to observe and count, allowing students to practice sampling techniques while learning about plant-insect interactions. In the following activity, students count goldenrod galls in a small area in order to estimate the number of galls in a large area. If Canada goldenrod is not plentiful in your area, a local botanist or entomologist should be able to suggest an alternative (thousands of insects induce galls on a wide range of host plants).

1. Identify and examine goldenrod plants with ball galls. Cut one open to demonstrate the presence of the insect larva.
2. Measure the study area by using a tape or by pacing it off. Estimate the total area, mapping it if desired.
3. Choose several sample plots to count. For example, if your site has an area of 800 square meters, and you have 10 pairs of students, you could have each pair count the goldenrod galls in a plot measuring four square meters. Have students consider: What are some different ways to distribute the sample squares across the site? Which might be best, and why? (For example, you might try to avoid bias by choosing sample squares randomly, or in some regular pattern across the site.)
4. Assign a pair of students to each plot. When they have tallied their results, have each pair use only their own data to predict the number of galls on the whole site. Now, using data from all of the plots, determine the average number of galls per four-square-meter sample and estimate the number on the site. Is this number the same as the prediction? Which estimate do you think is more accurate?

Extension: Students can count the number of goldenrod stems and the number of galls to determine the average number of galls per plant. Could this number be less than one? Both the number of goldenrod stems and the number of percentage of galls can be monitored from year to year in an area.

Primary Grade Activities

Patterns
Have students sort a collection of items (leaves, shells, rocks), using their own criteria (color, shape, size), and have other students try to “guess the rule.” Have children look for patterns in the schoolyard: the way leaves position themselves on stems, the number and arrangement of petals on the flower, the way the plants are planted in the garden areas, the way the fence is made.

Number sense
Count and graph plants or animals in the schoolyard. For example, on the first visit to a spring bulb garden students may count five purple crocuses and ten yellow ones. They then use squares of colored paper to make a histogram, one square per flower. As flowers come into bloom, the graph grows. While in the schoolyard, watch for the teachable moment. Example: There are birds on the fence, on the telephone lines, on the lawn. Count them, and then watch for one of them to fly away or another to arrive. Have students make a math sentence that tells what happened (7 sparrows – 2 sparrows = 5 sparrows) and illustrate the story problem on their clipboards.

Geometry
Go on a shape hunt to locate geometric shapes in the playground, gardens, and walkways. Give students a tally sheet with the shapes they are to look for and have them tally each time they find that shape. Extension: Have students draw the shapes and graph how many of each shape they found.

Measurement
Have students look for things to measure in the schoolyard, using both standard units and non-standard units. How many hand-widths wide is the path? How many steps? How would you measure an ant? What do you do when the plant is higher than the

— Char Bezanson
ruler? Practice using measuring tools: measure rainfall using rain gauges, temperature using thermometers, distance using tape measures, rulers, or string.

Graphing
Measure, count, and graph things that change over time such as temperatures, rainfall, the height of plants, the number of flowers in bloom, the length of shadows.

Intermediate and Middle School Activities
Collecting and describing data
After listing some characteristics of their schoolyard, have students choose a subject on which to collect and graph data, such as heights, numbers, or circumferences of trees; lengths of stems between leaves; number of anthills per square meter. Collect and graph weather data over time. Create graphs to show how the temperature and rainfall in your area compare with those in another area of the country or world, using the Internet or the newspaper for reference.

Number operations
Have students observe the outdoor classroom and record activities taking place in the form of word problems and mathematical sentences. Challenge them to find as many addition, subtraction, multiplication, and division stories as they can. Create a Playground Math Book with illustrations of these story problems and the math sentences that go with them. For example: The entire fourth grade is out playing softball. If there are two fourth-grade classes of 27 students each, and three softball fields, how many students are on each softball team if the students are evenly distributed in the fields?

Geometry
Have students use measured lengths of rope to create various geometric shapes and then calculate their perimeter and area. Find ways to estimate the area of irregular shapes. Identify and measure geometric shapes on the playground such as gardens and walkways, calculate their areas, and come up with related questions: How much fencing would be needed to fence a certain area of the playground? There are 450 students in our school. If they were all on the playground at one time how much space would each child have if we divided the area equally?

Measurement and estimation
Have a contest in which students measure and record everything they can find that is measurable within an allotted period of time. If they find something they think cannot be measured, such as a tall tree, have them make a note of it so the class can brainstorm whether it is indeed something that cannot be measured. If it cannot be measured precisely, can it be estimated? What strategies could be used?

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By the end of grade 4 students will:

A.4.1 Make observations, ask questions and plan environmental investigations* (see Science [SC] Inquiry; English/Language Arts [LA] Research)
A.4.2 Collect information, make predictions, and offer explanations about questions asked (see SC Inquiry)
A.4.3 Develop answers, draw conclusions, and revise their personal understanding as needed based on their investigations* (see SC Inquiry)
A.4.4 Communicate their understanding to others in simple terms (see LA Writing)

Energy and Ecosystems

B.4.1 Describe the flow of energy* in natural systems, citing the sun as the source of energy* on the earth; e.g., a food chain (see SC Physical Science)
B.4.2 Illustrate how they use energy* in their daily lives
B.4.3 List sources of energy,* distinguishing between renewable* and nonrenewable* sources
B.4.4 List the components of an ecosystem,* including the qualities of a healthy habitat* (see SC Life and Environmental Science)
B.4.5 Describe natural and human-built ecosystems* in Wisconsin
B.4.6 Cite examples of how different organisms adapt to their habitat*
B.4.7 Draw a simple hydrologic cycle*

Natural Resources and Environmental Quality

B.4.8 Describe and give examples of natural resources;* e.g., water, minerals, soils, air (see SC Nature of Science)
B.4.9 Distinguish between renewable* and nonrenewable* resources
B.4.10 Describe how they use natural resources* in their daily lives
B.4.11 List jobs in the community that result from or are influenced by processing and using natural resources*
B.4.12 Determine the cause of different types of pollution*

By the end of grade 4 students will:

C.4.1 Identify environmental problems and issues (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)
C.4.2 Apply ideas of past, present, and future to specific environmental issues (see SC Connections)
C.4.3 Identify people and groups of people that are involved in the issue
C.4.4 Identify some of the decisions and actions related to the issue
C.4.5 Identify proposed solutions to the issue and discuss arguments for and against the issue
By the end of grade 4 students will:

D.4.1 Demonstrate knowledge of a decision-making process that includes selecting and using data, suggesting possible alternatives, predicting consequences, and being aware of available resources (see SC Inquiry; LA Inquiry)

D.4.2 Identify and give examples of short-term and long-term solutions to a problem

D.4.3 Identify two or more ways to take positive environmental action; e.g., posters, letters, and speeches (see LA Oral Language)

D.4.4 Communicate with local, state, or national officials regarding an environmental topic (see LA Writing)

D.4.5 Explain how they can influence an environmental issue

D.4.6 Develop a plan, either individually or in a group, to preserve the local environment

By the end of grade 4 students will:

E.4.1 Identify and describe examples of their environmental civic responsibilities and the actions they take to meet them

E.4.2 Understand how their personal actions impact their civic responsibilities toward the environment (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)
A.8.2 Collect information from a variety of resources, conduct experiments, and develop possible solutions to their investigations.

A.8.3 Use techniques such as modeling and simulating to organize information gathered in their investigations (see Mathematics [MA] Process).

A.8.4 Use critical-thinking strategies to interpret and analyze gathered information (see SC Inquiry).

A.8.5 Use the results of their investigations to develop answers, draw conclusions, and revise their personal understanding.

A.8.6 Communicate the results of investigations by using a variety of media and logically defend their answers (see LA Writing; Math [MA] Process).

Energy and Ecosystems

B.8.1 Describe the flow of energy in a natural and a human-built ecosystem using the laws of thermodynamics (see SC Physical Science).

B.8.2 Explain how change is a natural process, citing examples of succession, evolution, and extinction.

B.8.3 Explain the importance of biodiversity.

B.8.4 Map the levels of organization of matter; e.g., subatomic particles through biomes (see SC Physical Science).

B.8.5 Give examples of human impact on various ecosystems.

B.8.6 Describe major ecosystems of Wisconsin (see SC Life and Environmental Science).

B.8.7 Illustrate the conservation of matter using biogeochemical cycles; e.g., carbon, nitrogen, phosphorous.

B.8.8 Explain interactions among organisms or populations of organisms.

B.8.9 Explain how the environment is perceived differently by various cultures (see SC Nature of Science).

B.8.10 Explain and cite examples of how humans shape the environment.

B.8.11 Describe our society as an ecosystem.

Natural Resources and Environmental Quality

B.8.12 Provide examples of how different cultures use natural resources reflecting the economic, aesthetic, and other values of that culture.

B.8.13 Diagram how resources are distributed around the world (see SC Nature of Science; Social Studies [SS] Political Science and Citizenship: Power, Authority, Governance, and Responsibility).

B.8.14 Identify the natural resources that are found in Wisconsin and those that are imported.

B.8.15 Analyze how people impact their environment through resource use.

B.8.16 Recognize the economic, environmental, and other factors that impact resource availability and explain why certain resources are becoming depleted.
B.8.18 Identify major air, water, or land pollutants and their sources

B.8.19 Distinguish between point* and nonpoint source* pollution*

B.8.20 Identify types of waste* and methods for waste* reduction (see SC Earth and Space Science)

B.8.21 Identify and analyze individual, local, regional, national, and global effects of pollution* on plant, animal, and human health

B.8.22 Identify careers related to natural resources* and environmental concerns (see SC Applications)

B.8.23 Identify governmental and private agencies responsible for environmental protection and natural resource* management

B.8.24 Create a timeline of Wisconsin history in resource management (see SC Nature of Science)

C.8.1 Define and provide examples of environmental issues,* explaining the role of beliefs,* attitudes, and values* (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)

C.8.2 Use environmental monitoring techniques; such as, observations, chemical analysis, and computer mapping software to collect data about environmental problems* (see LA Media and Technology; MA Measurement)

C.8.3 Use questioning and analysis skills to determine beliefs, attitudes, and values held by people involved in an environmental issue

C.8.4 Evaluate the credibility of information, recognizing social, economic, political, environmental, technological, and educational influences (see LA Writing)

D.8.1 Identify options for addressing an environmental issue* and evaluate the consequences of each option

D.8.2 List the advantages and disadvantages of short-term and long-term solutions to an environmental issue* or problem*

D.8.3 List reasons why an individual or group chooses to participate or not participate in an environmental activity in the home, school, or community

D.8.4 Explain the political, legal, and budgetary options for resolving local, state, and national environmental issues* (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)

D.8.5 Explain how personal actions can impact an environmental issue,* e.g., doing volunteer work in conservation

D.8.6 Develop a plan for improving or maintaining some part of the local environment and identify their role in accomplishing this plan

D.8.7 Identify examples of how personal beliefs* can influence environmental decisions

D.8.8 Give examples of education, economic, and government institutions' influence on an environmental issue,* and the role of citizens* in policy formation (see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility)

E.8.1 Formulate a personal plan for environmental stewardship*

E.8.2 Explain the importance of characteristics (such as, trust, patience, self-discipline, respect, and open-mindedness) that enable people to function together to resolve environmental issues*
Tips and Tricks for Taking Kids Outside

How to prepare yourself and your students for that first trip outside in the spring.

by Nalani McCutcheon and Andrea Swanson

In the middle of the night, are you jolted from your bed by nightmarish images of children running hither and yon in the wilderness as you take them out to investigate water quality in the nearby stream, play a predator-prey game, or study the life cycle of monarchs? If so, you are not alone. However, many educators have tackled these fears and made such adventures seem routine. It just takes practice, and keeping in mind a few key guidelines.

Have clear expectations

Before you walk out the door and into the wilderness — or even into the schoolyard — with your very excited and enthusiastic class, discuss behavioral expectations. This conversation can make or break your time together outside. Allowing students to help determine expectations (including the agreement to have expectations in the first place) sets up an atmosphere of mutual respect and ensures greater understanding of the rules and a greater willingness to follow them. Make a list of a few specific behaviors and state them in the positive. For example, an expectation that there will be “no yelling and screaming” may have the same intent as “use quiet voices,” but the latter is a positive statement of the specific behavior you wish to see. Plan the logistics.

- Have a clear signal for getting everyone’s attention and gathering together. It helps to practice it before you go outside.
- Discuss where you will gather when you get outside. If you will be on trails, establish clear meeting places such as trail intersections and trail heads.
- Explain to students that if they get separated from the group they should sit down and wait. Someone will come and look for them.
- Decide who will lead the group as you travel down the trail. Create opportunities for children to take turns leading.
- Use a variety of group sizes. Have students spend some time working in large groups, small groups, pairs and independently.
- To help focus attention, give specific assignments.
- Know your agenda and plans and let your students know what you are thinking while still being open to teachable moments.
- Discuss safety. If you will be near water, clearly explain the potential hazards. If you will be walking in the hot sun, make sure there is drinking water for everyone, sunscreen on exposed skin and hats on heads. If you are using snowshoes or cross-country skis, discuss their appropriate use. Bring a first aid kit and, if
someone is allergic to bees, a bee sting kit.

- Be ready for any kind of weather and dress appropriately. Bring extra mittens, hats, and boots if necessary. Rain gear and warm coats will make an enormous difference in the outcome of your outdoor activity.

- Evaluate your time together when you return indoors. Discuss what went well and what didn’t. Gather suggestions for activities and behavioral expectations for future trips outside.

**Practice and model activities**

Having clear assignments for students to complete when they go outdoors will help focus their attention. And whether it is a paper-and-pencil activity or an active game that illustrates an ecological concept, your expectations will be clearer to students if you practice before going outside.

Whenever possible, model what you want your students to do by becoming an active participant yourself. For example, if your students are drawing or writing in their journals along the trail, you should do it as well. This not only demonstrates that you value the activity; it is also an opportunity to show your students that you too are a student.

**Be flexible**

No matter how wonderful a teacher you are, natural lessons outdoors will sometimes be more compelling than the task at hand. The turkey vulture soaring overhead or the rabbit running across the trail may interrupt your lesson, but accept that it is a natural attention magnet for students. Take the broader view of learning and turn these opportunities to your advantage. They are the moments your students will likely never forget, and if you can bridge these spontaneous events to the lesson at hand, you will likely cement the learning. Your challenge is to find the bridge — and there will be one. The great thing about the natural world is that everything is connected to everything else.

**Communicate strategically**

In communicating with students outdoors, be prepared to face noise, atmospheric conditions, and other distractions that you cannot control. Take a lesson from the Interpretive field and keep the following in mind:

- Make sure the sun is in your eyes; then you can be sure that it isn’t in your students’ eyes.

- Put the wind to your back. This will push the sound of your voice toward the students.

- As you talk to students, try to reduce the distance between your mouth and their ears. Unless you are working with older students, this means kneeling down when talking. This keeps your voice from being lost in the wind, and it gives you a better perspective on what the world looks like from their view.

- If you are on a narrow trail and some students are having trouble seeing or hearing, have students form a double-file line. Stop the group, step off the trail, and walk toward the middle of the group. Have the students turn to face the side of the trail you are on, and have those in the front row kneel down. That way, everyone can see and hear without tromping off the trail.

- If you see something that you want to look at as a group (and it is appropriate to walk off the trail to it), lead the students in a single or double-file line behind you, and form a circle around it. You step into the center, and everyone can see.

- If you are on a trail you use often, place flags or markers along the way. Then if you want to allow students to travel up ahead of you, you can tell them to move at their own pace, but to stop at the next flag.

**Carry props**

When you first get started, you may fear that moment of having unfocused students and not knowing how to redirect their attention. Many teachers use a prop bag in which are packed focusing games (nature bingo, scavenger hunts, recipe of a forest), natural artifacts (seeds, leaves, antlers, fur samples, feathers), hand lenses, binoculars, and other aids. When you need to focus students’ attention, pull an appropriate item out of the bag. Students usually can’t wait to see what will come out next. In fact, you may find that you want to continue to use this even after you gain proficiency in taking your students outside.

**Empower yourself**

Let’s face it, to be a good teacher, you have to know yourself. You must have clear expectations and personal goals, and a sense of their priority so you can monitor and adjust in a heartbeat to assure that the end result is satisfactory. Just as an athlete takes time to practice on a new field before a competition, so too must teachers take time to establish a personal comfort with the new learning environment.

Prior to taking your students outside, visit the area and become familiar with it. Visualize in your mind where your students will be for different parts of the lesson and what areas you want to make sure they avoid. Structure your lessons to take advantage of the opportunities available while remembering the potential challenges. A trip to the pond is full of exciting learning possibilities, but there are wet shoes and clothing to think about as well.

The size of your group should depend on your comfort level. Bringing additional adults to assist with your outdoor adventure can be helpful, and most schools have policies that require a certain ratio of children to adults. It helps to make sure the supporting adults are aware of your expectations, both of the children and of them.

Finally, remember that your level of comfort is not built by your classroom walls; it is built within your mind. If you set clear expectations, plan ahead, and follow a few key guidelines, you will eliminate most potential stumbling blocks. You will also find that your outdoor excursions will be more fun for everyone, including you. Now sleep well!

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Teaching Outdoors

Learning in the outdoors will encourage learners to respect themselves and their natural environment. Skills that promote these understandings are developed by participating regularly in many outdoor activities. Whether learning the secrets of successful tree planting or the effects of water quality on organisms found in a stream, learners can become more engaged and successful through the use of hands-on experiences in the outdoors.

Several strategies can make outdoor learning experiences more rewarding for both the learner and the leader of the experience. The following strategies can help you as you explore the outdoors with the learners.

Preparing the Activity

- In the beginning, choose the curriculum area which is your greatest strength to use as the basis for designing outdoor activities.

- Use an activity with a high percentage of success for learners. A variety of answers, diverse opinions, and different perspectives will generate a positive attitude.

- For the first several times that learners study outdoors, investigations that are short and focused are very effective.

- Use procedures and structures that learners are familiar with (recording data, grouping, using equipment, reporting, etc.).

- Be familiar with the collection laws in the area. The Department of Natural Resources or local extension service should have this information.

- Plan adequate time including going to and from the outdoor site (even if just outside of the school building).

Preparing the Learners

- Understand that some learners may not have had outdoor learning opportunities and may be uncomfortable. Some misbehavior may be due to this discomfort.

- Give learners advance notice before going outdoors so that they may dress appropriately for that day (comfortable shoes, rain gear, jackets etc.).

- Establish with the learners the objectives for learning outdoors.

- Before going outdoors, help the learners set appropriate guidelines for behavior.

- Select a partner or small group with which the learner must stay.

- Have learners gather and bring all necessary equipment.

- Set boundaries, time limits, and a place to meet.

- Agree upon a signal to call the group back together (raising a hand, setting time limits, clapping several times, making a bird call, etc.).
### Outdoor Classroom Materials
Located in the IMC

**Ecology**

- *A Guide to Field Identification Birds of North America*
  - Discover Nature in winter by Elizabeth Lawlor

- *Ecology*
  - Identifying Animal Tracks by Richard Headstrom

- *The Edible Flower Garden* by Rosalind Creasy

- *The Edible Salad Garden* by Rosalind Creasy

- *The Web of Nature* by Ted Pettit

- *Weeds in Winter* by Lauren Brown

- *It’s Raining Frogs and Fishes* by Jerry Dennis

- *Under One Rock* by Anthony Fredericks

- *Backyard Conservation*
  - Gardening/Native Flowers/Composting

- *Listening to Nature* by Joseph Cornell

- *Wetlands/Ponds*

- *Big. Big World* by Bill Harley

- *Captain Ecology*

- *Eric Nagler*

- *The Environment*

- *Connection for LEAF, WILD, etc.*
  - Project WILD

**Renewable Energy**

- *Renewable Energy*

- *Renewable Energy Factsheets*

- *Renewable Energy Today*

- *Secondary Energy Information Book*

- *Solar Boat* by Pat Rand Rose

- *Wisconsin Energy Statistics 2002*

- *Done in the Sun!*

- *Science Projects in Renewable Energy*

- *Secondary Energy*

- *Renewable Energy*

- *Solar Energy/Wind Energy*

- *Wisconsin Natural Resources*
**KEEP-K-12 Energy Education Program**  
*Know the Flow of Energy in Your Classroom (K-4 KEEP)*

### Forestry
- *The Tree in the Ancient Forest* by Carol Reed-Jones
- *Wisconsin Forest Tales* by Julia Pferdehirt

### New Tree Planting/How to Prune/Tree Planting
- *Trees Are Tremendous*
- *Project Learning Tree (K-6)*
- *Wisconsin Forestree* by CWES (4-8)
- *WI Forests Forever* (3-8)

### A Tree for Every Child

### Environmental Issues

#### Air/Water Pollution
- *Easy Breathers*
- *Scientists and the Alaskan Oil Spill*
- *Where's The Air?* (air pollution)

#### Solid Waste Issues/Recycling
- *Recycle This!*
- *Solid Waste Pollution*
- *Time & Time Again*
- *Yes, I Can!* (k-3)

#### Endangered/Extinct Animals
- *Causes of Extinction*
- *Wildlife for Tomorrow*

#### Global Warming
- *Balancing Needs: Coal and the Environment*
- *Global Warming*
- *The Greenhouse Effect*

#### In General
- *50 Things Kids Can Do to Save the Earth*
- *Exploring Environmental Issues*

### Miscellaneous

#### Engaging & Involving Stakeholders in Your Wetland
- *See Cella Chow!* (Purple Loosestrife)
- *Walk on the Wild Side: Explore Public Lands*
- *Wetland Restoration Handbook* by Alice Thompson
Environmental Education and The Outdoor Classroom

For you, for the students, for the community.

Environmental Education
To encourage and enable students to become active citizens in their communities by fostering:

- Environmental sensitivity
- Personal investment
- Knowledge of action strategies
- Internal locus of control

Sub-goals of E.E.

- Awareness
- Knowledge
- Values (ethics)
- Citizen action skills
- Citizen action experiences
E.E. Emphasizes

- Multi & interdisciplinary learning
- Higher order thinking skills
- Real world problem solving

Catholic Social Teachings

Care for God's Creation

- We are merely stewards of God's creation.
- We must care for the environment.
- School premises should be inviting and well maintained.
- We should take pride in appearance of school.

Environmental Education

Academic Standards
Outdoor Sites: Why have them?

- Early natural experiences influence creativity, imagination and a sense of self.
- Build environmental sensitivity, especially with frequent exposure to a habitat area.
- Help students gain awareness and appreciation of the natural world.
- Will encourage learners to respect themselves and their environment.
- Provide hands-on learning.
- Provide concrete experiences.
- Students with behavioral or learning difficulties often perform better in an outdoor setting.
- Promote the use of democratic decision making, communication skills and teamwork.
- Give children the empowerment to make a personal contribution toward improving their community.

Goals for our outdoor classroom

- To increase the amount of E.E. taught in our school.
- To increase the amount of "green space" available to students in order to increase their awareness of nature & the environment.
- To be an area that can easily be used by teachers for classes.
- To be an area that will lend itself to hands-on, real-life learning experiences.
- To be an area that will include habitat for wildlife.

Nativity Catholic School
Outdoor Classroom

Present
Tips for taking a class outside:

- Have clear expectations & discuss with students. Choose an activity with a high percentage of success for learners.
- Have a clear signal for getting everyone's attention.
- Discuss where you'll gather outside.
- Use a variety of group sizes during activity.
- Have a job for everyone, give specific instructions. Have students bring out the needed equipment.
- Dress appropriately. Have the sun in your eyes & the wind at your back.
- Evaluate your time together in a sheltered spot/indoors.
- Be flexible, relax & enjoy the experience!
The help you need.

Resource center for teaching E.E. and for using the outdoor classroom.