ENHANCING THE ENVIRONMENTAL EDUCATION CURRICULUM
OF THE MARSHALL SCHOOL DISTRICT BY
RESTORING A NATIVE PLANT COMMUNITY,
DEVELOPING CROSS-CURRICULAR LEARNING MATERIALS AND
PROVIDING OPPORTUNITIES FOR TEACHER INSERVICE
TRAINING IN UTILIZING THE SITE EFFECTIVELY

by

Jami Hoekstra Collins

A Project Submitted in Partial Fulfillment of the
Requirements of the Degree

MASTER OF SCIENCE

Natural Resources – Environmental Education
for Elementary and Secondary Teachers

UNIVERSITY OF WISCONSIN
Stevens Point, Wisconsin

July, 2002
APPROVED BY:

Dr. Randall Champeau
Professor of Environmental Education
2002
ABSTRACT

This paper documents the enhancement of the environmental education curriculum of the Marshall Public School District. A collaboration with the Marshall Area Historical Society was undertaken in the fall of 1999, having as its central focus the reconstruction of Marshall’s one room schoolhouse, Box Elder, in conjunction with a prairie restoration. This partnership strove to connect students with their surrounding community by bringing together people of all ages, as well as giving Environmental Education in the Marshall School District cohesion and active learning experiences. Support was sought from many sources including the Marshall School District PTA, school administration, the Marshall Area Historical Society and the Marshall School District faculty. Money was raised in the spring of 2000 by the Marshall PTA.

During the 2000-2001 academic year, the Marshall School District joined the Earth Partnership Program, sponsored by the UW-Madison Arboretum. This program provided staff training in prairie restoration in order to integrate ecological concepts into all subject areas and grade levels. It gave teachers direct, hands-on experiences that can be applied in the classroom and utilized with students. During the summers of 2000 and 2001, a total of five teachers and two Marshall Area Historical Society members, representing the Marshall School District and Community, received four weeks of intensive training in prairie restoration and maintenance.

In the fall of 2001, Marshall School District teachers, grades PK-8, were surveyed to document their potential interest and willingness to participate in prairie restoration. Teachers were asked seven questions spanning from the importance of environmental
education to their interest in restoring and utilizing an outdoor natural area with their students. Staff members were also asked if they would be willing to work with community organizations and members, such as the Marshall Area Historical Society, in order to preserve the educational and ecological history of Marshall's first one room schoolhouse and its surrounding environment.

During the 2001-2002 school year, the Marshall Early Learning Center (grades PK-2) planted a butterfly garden to serve as a species garden for the prairie restoration which will be planted in the fall of 2004. A collection of curricular materials, the Prairie Pack, was organized for teachers in order to utilize the site effectively. Mini-inservices were conducted by fellow staff members, trained in the Earth Partnership program, to assist teachers in integrating Prairie Pack activities into their curriculum.
ACKNOWLEDGEMENTS

It is with gratitude (and relief) that I acknowledge the many people who have provided support for this project. My deepest appreciation goes to Roger Johnson and Judy Brinkman, as well as Wayne Kiefór, for their tireless volunteer efforts as members of the Marshall Area Historical Society. They have been incredibly patient, determined and motivated to continue working with the Marshall School Board in finding an official location for the Box Elder Schoolhouse and restored prairie.

I would also like to thank Gini Frey and David Schuler of the Marshall School District. To Gini for working on the National Garden Grant and getting the ball rolling on landscaping ELC grounds, as well as the endless time she volunteers in maintaining those grounds. To Mr. Schuler for working to bring closure to a decision that has taken a long time to resolve.

Personally I would like to thank Alice Krembs for allowing me to stay in her home during the first three years I was in the EE program. Her spunky energy and warm hospitality made attending classes while I was eight months pregnant not only tolerable, but comfortable.

Most importantly, I would like to thank my husband, Geoff, as well as my daughters, Marjorie and Lydia. Their loving encouragement lightened my load and made the completion of this project possible.
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THE PROBLEM AND ITS SETTING

The Statement of the Problem

The purpose of this project is to enhance the environmental education curriculum of the Marshall School District by restoring a native plant community, developing relevant cross-curricular learning materials and providing opportunities for teacher inservice training in utilizing the site effectively.

Subproblems

Subproblem 1: To obtain support of administration, staff and the community in the development and implementation of a native plant community for the Marshall Public Schools.

Subproblem 2: To procure a site for a native plant community for use by all of the schools in the Marshall Public School District, focusing on grades PK-second grade.

Subproblem 3: To restore a native plant community for use by all of the schools in the Marshall School District focusing on grades PK-second grade.

Subproblem 4: To develop relevant cross-curricular learning materials in relation to the restored prairie.

Subproblem 5: To provide inservice training opportunities for staff members in prairie restoration and its infusion into current curriculum.
The Significance of the Project

Currently, the Marshall Public School District has no environmental education curriculum. Because of state standards being implemented and the entire district curriculum undergoing a revisioning (mapping) process, most teachers now recognize that EE must be implemented in some way. This project is significant because it answers some of the What? And How? questions of EE implementation, specifically focusing on EE infusion within the Prekindergarten through second grades. Reasons why EE is important will be a consistent undercurrent in all of the restored prairie materials being covered.

Because of Marshall’s relatively small size and the fact that each school in the district is within walking distance from each other, the development of a shared outdoor site on school grounds is ideal. In order for this natural area to have special significance for the Marshall School District and community, the native landscaping proponents became involved with the Marshall Area Historical Society. Not only did the Marshall Historical Society support the idea of restoring a prairie, but they improved it tremendously by incorporating the reconstruction of Marshall’s one room schoolhouse, Box Elder. The two projects became an ideal partnership, as well as an incredible opportunity, for people of all ages, throughout the community, to work together in appreciation of history and education.

Interest in a nearby natural area was generated through informal talks with the staff. Fellow teachers expressed a need for a cohesive EE curriculum within each elementary grade level. EE inservice training would be required to supplement work being done in the classroom. The Box Elder School and restored prairie would provide
the teachers of the Marshall School District with an outdoor facility that is within easy access of the schools and which gives EE in Marshall a much needed focus.

The Box Elder School and restored prairie is a unique opportunity to combine ecological, historical and educational learning experiences with Marshall community members and students of varying ages. A restored prairie is perfectly suited to Marshall because the school district property was a prairie/oak savanna before it was plowed for farmland. One member of the Historical Society, who is now a school district custodian, actually recalls the “tall grasses blowing in the wind” which surrounded the original school yard.

This project has distinct advantages for the Marshall School District because of the ELC’s acceptance into, as well as proximity to, the UW-Madison Arboretum’s Earth Partnership program. Many Marshall residents have restored part of their own land into natural areas/prairies and have expressed interest in developing a group of knowledgeable, committed volunteers who are very willing to ensure the Box Elder School and restored prairie are utilized and maintained well.

**The Delimitations**

1. This project is not meant to constitute the entire EE program for the Marshall Public Schools in grades Prekindergarten through second grade. The Earth Partnership team will only be developing relevant prairie curricular activities for Prekindergarten through second grade. Extension ideas will be shared and made available to teachers in third through eighth grade.
2. This project will not include the actual writing of the supporting curriculum for the native plant area and corresponding one room schoolhouse. It will provide activities as well as environmental education guidelines for teachers and students who will utilize the natural area.

**The Definition of Terms**

*Outdoor learning facility* – a natural area out of doors which will accompany the reconstruction of the original Box Elder one room schoolhouse and serve as a “classroom” where students can learn environmental concepts in an active hands-on manner.

**MAHS** – This abbreviation will be used to stand for the Marshall Area Historical Society.

**MPS** – This abbreviation will be used to stand for the Marshall Public Schools.

**EE** – This abbreviation will be used in place of the words environmental education.

**EP** – This abbreviation stands for Earth Partnership and when coupled with the word team includes the teachers and Marshall Area Historical Society members who were involved in the Earth Partnership for Schools training program.

**Assumptions**

*The first assumption* – there is a need for an outdoor facility for MSD students.

*The second assumption* – grade levels PK-2 will participate in the program.
The third assumption – the effort will be supported by MPS teachers, families, administrators, and Marshall community members.

The fourth assumption – a task force will be formed to help with the development, implementation and evaluation of the project.

The fifth assumption – an outdoor facility, once implemented will support and improve a cohesive Environmental Education curriculum for the Marshall Public Schools.
LITERATURE REVIEW

Value of Outdoor Education

In this particular project, the value of outdoor education is significant because it is incorporating active ecological restoration. This means students, staff and community members will be directly involved in an ongoing process of restoring an ecosystem to a state that as nearly as possible mimics a given site; where even a small butterfly garden at a school can serve the valuable purpose of providing students with opportunities to have interactions with the natural world. At the same time, by planting native species and providing nectaring and food sources for insects and birds these small areas contribute to the environmental health of the larger system. (UW-Arboretum – 2000).

Simon Priest, in his article “Redefining Outdoor Education: A Matter of Many Relationships” makes six points in regard to the value and importance of outdoor education. First outdoor education is a method for learning (Priest, 1986). It is an active experience where students learn by doing, restoring and monitoring. The learner and community develop a symbiotic relationship; both benefitting the other in positive ways.

Second the process of that learning is experiential (1986). One has to experience nature in its natural state-obviously outside. Students cannot learn about trees, for example, as effectively without actively observing and studying them in their natural environment.

Third, the learning in outdoor education takes place primarily, but not exclusively, in the outdoor setting. The outdoor setting is certainly the focus area. Complementary
learning activities and experiences enhance what is being taught indoors and vice versa, in order to develop an entire EE program.

*Fourth, experiential learning requires full use of the six senses (sight, sound, taste, touch, smell and intuition) and involves the three domains (cognitive, affective and motoric) of learning* (1986). Outdoor education provides active opportunities to incorporate varying teaching methods and learning styles. According to Howard Gardner’s multiple intelligences, the more instructors can match students to congenial approaches of teaching, learning and assessing, the more likely it is they will achieve educational success.

*Fifth, the learning in outdoor education is based upon interdisciplinary curriculum matter* (1986). Utilizing the outdoor educational facility, in conjunction with Box Elder School, may provide various avenues for instruction in all subject areas. It is a unique learning opportunity which not only connects curricular areas, but classrooms and community members of various age levels.

*Sixth, and most importantly, the learning in outdoor education is a matter of many relationships. The relationships concern not only natural resources, but also people and society* (1986). Restoring a native plant community promotes students to work cooperatively together to achieve a common goal. This project encourages an independent and collective sense of ownership through active involvement, empowering participants to feel that they can have a positive impact on the world around them. Restoring the land to its native condition is an ecosystemic activity. True ecological restoration is not fully possible. This project strives to reach an approximation because
replacing all the species (and their interactions with one another) cannot truly be accomplished (Cowell, 1993).

Ultimately, students are supported to make changes in the world that sometimes seem impervious to their efforts. Their actions go beyond themselves to a common good... It is exciting to realize that a simple project to take action to improve school grounds as habitats for people and wildlife can contribute to a lifelong ethic of responsible action. (Schiff-Smith Walters, 1993)

**Value of Outdoor Sites in an EE Curriculum**

According to Cross and Willis (1994) the best reason for connecting students to a natural resource area is that it works! They state that “a strong connection to the larger world community starts with an intimate local understanding”. By directly experiencing and applying the knowledge of ecological systems and concepts on a personal local level; students are better able to understand environmental issues on a global level. “A personal stake in the lives of their wood ducks, red tailed hawks or metamorphosing moths becomes an intrinsic understanding of the richness present in ecosystems” (Cross, 1994). An outdoor site taps into children’s cooperative “innate desire” to care for their world and allows them to do it in an organized and structured way. It empowers everyone involved at the local level, providing that active, informed citizens can and do make a difference in their environment.

Cross and Willis (1994) report that students who were participants in an outdoor EE school partnership “feel better about the way they are learning”. They say “they have more fun and are learning things they didn’t know before”. Teachers feel that students
“really retain the things they learn and are better able to apply the learning in other situations”. These responses imply that children are receiving solid training for informed citizen action and responsibility. When students are able to impact an area in a positive way, it helps them realize the healing potential they have as caring human animals”.

Wilson (1993) provides further implications for children in the value of outdoor sites in environmental education. She states that “Children become more aware of natural sights, sounds, smells and textures through direct repeated experience with them”. Active involvement leads to effective learning. Children are developing critical observational skills by exploring the uses of all their senses, developing a connection to the outdoors through personal experiences with it.

Wilson (1993) states a startling statistic: “Most people spend 95% of their lives (from birth to death) indoors. Our “built environment isolates us from the realness of the natural world”. The consistent use of a natural resource site can dispel that statistic. A major goal of an effective environmental education curriculum plan is to offer a richness of nature-related experiences, especially for young children who are beginning to develop a personal set of environmental ethics. A natural outdoor site offers an ongoing relationship with a specific area, fostering growth in children’s awareness and appreciation of nature.

Factors Influencing the Use of Outdoor Sites for EE

One of the most significant factors influencing the use of an outdoor site for EE is its proximity to the school and accessibility to the teachers. In the book Geography of Childhood: Why Children Need Wild Places (1994) by Nabhan
and Trimble, Nabhan states that children engage themselves on their hands and knees, concerned with what is immediately before them. A few intimate, repeatedly frequented places mean more to them than any of the glorious panoramas they could observe in photographs from distant places they may never have the opportunity to directly experience.

Nabhan also focuses on the playground experience of elementary students. Schools need to find ways to “let children roam beyond the pavement, to gain access to vegetation and earth that allows them to tunnel and climb. Shouldn’t we be paying more attention to planting and less to building on school grounds?”

**Prairie Related Curricular Materials**

The Earth Partnership for Schools program through the UW-Arboretum provides an incredible resource in prairie curriculum and instruction, teacher inservices and connections with existing restored prairies on school sites. It started in 1991, focusing on ecological restoration and hands on experiences teachers and students have the potential of developing together. Since 1991, over 130 schools have participated in the program and worked to restore native landscapes on their school grounds.

The Earth Partnership program emphasizes children’s need for a sense of place by providing them with an abundance of integrated curricular activities that encourage students to explore their natural surroundings. Each activity connects with different state standards and builds on children’s developmental abilities as they move up in grade levels. Acceptance into the program provides teachers an opportunity to actively restore native plant communities, connect with schools across Wisconsin who have already
restored native landscapes on their school sites and develop action plans to incorporate a schoolyard restoration of their own.

**Characteristics of Successful EE Professional Development**

The National Consortium for Environmental Education and Training investigated inservice training for PK-12 teachers. They discovered changes need to be made in the current perspective of EE and how it is delivered to educators. One of the most important components, according to Wade (1996) is for teachers to be “engaged in the design of curriculum, which fosters commitment and development of materials relevant to teachers’ needs”. EE inservices should focus on the interdisciplinary, educational nature of EE, not only the science based content. Inservice trainers are encouraged to treat teachers as professional educators, not as curricular consumers.

Effective EE inservices should give educators the opportunity to reflect critically on their own practice. Wade (1996) gives an alternative to text based curricula. It involves, a) critical analysis of values and sociopolitical structures b) action in and reflection on local environmental issues, and c) intimate involvement between learners and local communities.” Wade states that an EE curriculum is not a supplement to science, but an interdisciplinary “discussion and debate about relationships between theory and practices”. In order for EE to be effective, it must build bridges between formal education and educational reform. Educators and administrators require fundamental changes in their thinking.

Ham and Sewing (1987) summarized successful characteristics of EE inservice programs which focused on motivating educators. They felt teachers should be inspired
to make positive changes in their current implementation of EE which stress methods, as well as content. Cline (1993) specified a need to understand the characteristics of adult learners in the development of teacher inservices. She recommends building on teachers’ connections of past experiences to new learning situations, encouraging them to try new methods and approaches.
PROJECT METHODOLOGY

Treatment of the Subproblems

The following methods were used to solve each of the subproblems identified in the development and implementation of the outdoor natural area for the Marshall Public Schools.

Subproblem One

The first subproblem was to obtain support of administration, staff and community members in developing and implementing a native plant community.

This project was initiated in the fall of 1998 through informal discussions with the staff and administration in developing an outdoor natural area. Interest in not only developing an outdoor site, but creating a consistent environmental curricular focus, was noted and the process of procuring a site was begun.

The Marshall Area Historical Society was contacted as potential partners in this project. Combining the need to restore the original one room schoolhouse, Box Elder, with a native plant community, became an ideal way to involve the community in environmental and historical education. The MAHS supported the joint effort and made the commitment to present the shared vision to the Marshall School Board in the spring of 1999 (Appendix A).

The March 17, 1999 school board meeting approved the restoration of Box Elder School, in conjunction with a restored prairie, to be located on school district property.
and available to the public. The decision was dependent on legal counsel to determine safety and liability issues. Successive meetings were scheduled into the fall of 1999.

Subproblem Two

The second subproblem was to procure a site for a native plant community for use by all of the schools in the Marshall School District, focusing on grades Prekindergarten through second grade.

The restored natural area and one room schoolhouse, Box Elder, was initially approved in March, 1999, dependent on legal counsel. Two major concerns were the inclusion of a basement under the schoolhouse for cooling/heating and storage purposes as well as the permanence of Box Elder School once reconstructed. The MAHS demanded the language in the contract be such that Box Elder School could never be torn down/relocated because of its admittance into the National Register of Historic Places.

Because of these issues, the MSD and MAHS needed to be cautious in reaching an agreement upon where the schoolhouse and natural area should be located. Prairie proponents felt strongly about the idea of "nearby nature" and encouraged the final decision to be within walking distance of the ELC and elementary school.

In order to resolve where Box Elder school should be placed, as well as other school district population growth and expansion needs, the new superintendent, David Schuler, developed a "restructuring task force". This task force was comprised of community and school district staff members who would meet monthly and discuss the "restructuring" needs of the district. Wayne Kiefor, chair of the Box Elder Schoolhouse
restoration and member of the MAHS, was a part of these discussions as well as Holli Viken, first grade teacher and Earth Partnership participant.

Subproblem Three

The third subproblem was to restore a native plant community for use by all of the schools in the Marshall School District, focusing on grades Prekindergarten through second grade.

Due to the problems in securing a site for Box Elder School, the restored natural area has not yet been established in conjunction with the one room schoolhouse. Instead, a butterfly species garden was developed during the spring semester of 2002 in front of the Marshall Early Learning Center (grades PK-2). This native plant community serves as a species garden for the Box Elder School prairie which has been approved by the School Board to be planted where the current elementary school is located. The timing of the planting depends upon the legal issues regarding the new elementary school’s placement, when the current 3-5 building is demolished and when the new building’s possible drainage issues are resolved. At this time, the prairie restoration is scheduled to be planted in the fall of 2004.

The Marshall PTA, in support of the Historical Society and restored prairie Partnership, contributed $750.00 worth of prairie plants and seeds in the spring of 1999. The money remained in the form of a gift certificate from Prairie Nursery Seed Company. Funding for teacher training came through acceptance into the Earth Partnership Program. This program, conducted by the UW-Madison Arboretum and
funded by the National Science Foundation, provided five teachers from the Marshall Public Schools, and two Marshall Historical Society Members, with over $10,000 worth of workshops, training and technical support for the teaching of restoration based environmental education.

Subproblem Four

The fourth subproblem was to develop cross-curricular learning materials in relation to the restored prairie.

In 2000, the Marshall Public School District was accepted into the Earth Partnership program through a grant provided by the UW-Madison Arboretum and the National Science Foundation. This program provided prairie restoration training as well as a scope and sequence for many activities developed by the UW-Arboretum. Technical assistance was available at any time if needed.

Five teachers from the Marshall Public School District and two members of the Marshall Area Historical Society attended two to four weeks of training at the UW-Madison Arboretum, where they participated in activities related to the use and incorporation of prairie restoration into state standards at every grade level and including all disciplines.

Subproblem Five

The fifth subproblem was to provide inservice training opportunities for staff members in prairie restoration and infuse it into current curricula.
Providing inservice training opportunities met with very limited success. The Marshall School District was accepted into the Earth Partnership program at the University of Wisconsin-Madison Arboretum. This partnership included inservice training with its participants. However, without an existing site established (let alone officially in the “working stage”) the Director of Curriculum and Instruction felt the inservice opportunities should be placed “on hold”. Because of this, the participating Earth Partnership teachers held their own “mini-inservices” in the spring of 2002 as the ELC (grades PK-2) prepared their butterfly and species garden plot.
PROJECT RESULTS

Subproblem One

The first subproblem was to obtain the support of administration and staff in developing a native plant community.

In March of 1999, the Marshall School Board approved the restoration of Box Elder School and corresponding natural area. Questions were raised as to the best placement of the schoolhouse and legal issues regarding the reconstruction of the schoolhouse itself. General support for the project was established during this time, however, many staff members demonstrated a lack of understanding in regard to native plants, assuming they were just “a bunch of weeds”.

The EP team decided to refer to the natural area as a butterfly garden in order to change the perception of the project from “weed patch” to “wildlife refuge”. From the first acceptance of the restoration of Box Elder School and natural area until its present status today, the district administrator position of the Marshall School District changed three times as well as the composition of the Marshall School District School Board. By the fall of 2001, it appeared that the EP team needed to reeducate its school board members on the goals and vision of the entire Box Elder restoration project.

The EP team developed a survey for staff members in the fall of 2001 to present to Marshall School Board members. The survey was also used as a basis of comparison for future inservices on ecological restoration. The survey asked if staff members wanted to “go native!” (Appendix D). It sought to determine if general elementary educators felt:

1. Environmental education is important.
2. Working with community members strengthens their curriculum

3. Willingness to become involved with a restoration effort that incorporates the community and the MAHS.

4. Willingness to utilize the restored site with students.

5. Supporting inservice time on prairie restoration and its incorporation into existing curricula.

Of the sixty surveys, three were sent to administrators and fifty-seven to elementary teachers (Prekindergarten through Eighth grade). Forty three surveys were returned.

The results, compiled in Appendix D, indicate teachers strongly agree that environmental education is important, as well as working with community members to strengthen their curriculum. Most teachers agreed on being interested in getting involved with the restoration project and utilizing it with their students.

- 94% of respondents agreed or strongly agreed that working with community members strengthens their curriculum.
- 76% of respondents agreed or strongly agreed that a prairie restoration project would be enhanced by working with the Marshall Area Historical Society.
- 70% of respondents agreed or strongly agreed that they would like to be involved with a community project of this type.
- 79% of respondents agreed or strongly agreed that they would be interested in working with this restoration project and utilizing it with their students.

Comments gathered from the survey indicated a few teachers were concerned about student safety while utilizing the prairie. Some staff members perceived a lack of
cohesion with their specific subject area (mostly pertaining to the middle school teachers who are divided by subject areas).

The final question on the survey asked if teachers would support the use of inservice time to learn more about how they can incorporate a natural area into their existing curricula. The responses were equally divided with staff members indicating either agree or strongly disagree. As a result, the EP team would like to plan a general, informational inservice to generate interest in regard to the Box Elder School restoration. Following the general project overview, teachers may choose to pursue the project with further inservice time if they would like more specific information and activities.

Jami Collins, representing the EP team, as well as several parents in the Marshall community who have restored parts of their lawns into natural areas, presented these survey results, as well as more detailed information in regard to the Box Elder restoration project, to the Marshall School Board in January of 2002. The School Board response was very receptive and the district administrator, David Schuler, assured all present that if the referendum passed for a new elementary school, the site for the Box Elder School and natural area would be secure and “guaranteed”.

Marshall’s local newspaper, The Waterloo Courier, has written two articles on the Box Elder School and natural area restoration in order to generate community awareness of the project. An informational article was shared in the Marshall School District’s monthly newsletter as well as with the Marshall PTA, an organization in complete support of the EP team and MAHS’s efforts.
Subproblem Two

The second subproblem was to procure a site for the restoration of Box Elder school and natural area for use by all of the students in the Marshall Public School District as well as the community.

The Box Elder Schoolhouse and natural area restoration project was initially approved in March of 1999. It was to be located behind the Early Learning Center, on a south facing slope along Rt 73. A high school student, working on an independent study project in landscape architecture, designed a map of the area and schoolhouse to present to the district administrator at that time, Mike Davis. The legal firm, Lathrop and Clark, on behalf of the Marshall School Board, was consulted to make an Easement Agreement (Appendix B) with the MAHS. Both parties (MAHS and the Marshall School Board) agreed at this time that the site seemed like a perfect spot for both schoolhouse and restored natural area.

The legal documents included wording that was deemed unsuitable to the needs of the MAHS because of two reasons:

1. The Marshall School District wanted to retain the right to tear down Box Elder School, having given a 90 day notice, in case the ELC ever needed to expand southward. The MAHS found this unacceptable because the Box Elder School, once reconstructed, would be considered an official historical building to be placed on the national register of historic places.

2. The MAHS insisted on including a basement for heating and cooling purposes as well as storage, which was not detailed in the contract drafted by Lathrop and Clark.
Due to these legal concerns, the Marshall School Board decided to reevaluate the current site proposed because of expansion needs in the ELC, and brainstorm potential sites in and around the district as future possibilities.

By the fall of 2000, the current high school principal became the new district superintendent, David Schuler. Schuler created a "restructuring task force" comprised of community members, as well as Marshall School District staff members, who would meet monthly and assess the growing needs of the district. Wayne Kiefor, chair of the MAHS Box Elder School Restoration project committee, as well as Holli Viken, EP participant and first/second grade teacher, served on the task force. Throughout the year different sites were discussed for the Box Elder School and Natural Area. One steady possibility was in between the Middle School and Early Learning Center. This was later dismissed because of the underground JEDI cables connecting the computer systems and the problems the basement may cause in relation to those cables.

By the end of the 2000-2001 school year the restructuring task force determined the entire Elementary School needed to be upgraded or replaced. Upgrading turned out to be more costly than replacing (and relocating) the entire building. With this relocation effort, assuming the referendum for doing so passed, Box Elder School and natural area (now termed as butterfly garden) could be restored on the southeast corner of the space formerly known as the Elementary School adjacent to its playground. This location was presented to the MAHS in January 2002 by David Schuler. MAHS members agreed this was a fair compromise and again, depending on legal issues, the new site of Box Elder school and butterfly garden was accepted.
In March of 2002, the referendum passed and Box Elder School was slated for reconstructive efforts during the spring and summer of 2003. Once the schoolhouse is restored, the natural area may be developed and planted.

Subproblem Three

The third subproblem was to restore a native plant community for use by all of the schools in the Marshall Public School District, focusing on grades PK-second grade.

1) Finances: Funding for the project came from two sources. The Marshall PTA provided up to $750.00 for the natural area aspect of the project and the rest was secured through acceptance and participation in the Earth Partnership for schools program.

The Marshall PTA had a very successful fund raiser during the 1999-2000 school year. They asked interested teachers to present ideas at their meeting on creative ways to utilize their surplus in funds. The idea of native landscaping with the creation of a butterfly garden, as well as the partnership effort with the MAHS, was well received. In the spring of 2001, the Marshall PTA voted to donate $750.00 to the native landscaping and beautification of school district grounds.

Funding of teacher training, as well as an entire acre of prairie seed, came with the acceptance of the Marshall Early Learning Center into the Earth Partnership for Schools Program at the UW-Madison Arboretum. The Marshall ELC was selected to participate through a grant by the Howard Hughes Foundation and the UW-Arboretum. Through this program, the Marshall School District has received approximately $12,000 worth of teacher training, project support and prairie seed. Working with the Earth
Partnership staff, and benefitting from their abundance of resources and advice, has proved to be the most crucial connection between educating all teachers on how to incorporate the restored outdoor classroom into their current curricula.

2) Facilities: Due to the problems in procuring a permanent site for the Box Elder Schoolhouse and natural area, the EP team decided to work with an existing landscaped area in front of the ELC. This area desperately needed volume and a planned range of bloom times. The EP team worked to plan a butterfly species garden that could later be used as a teaching tool for native species that students may experience growing in the natural area behind Box Elder School.

In the spring of 2002, each classroom was given a set of cards. These cards depicted a variety of butterfly garden plants that bloomed at a certain time. Prekindergarten students received spring blooming species, Kindergarten-early summer, First grade-mid summer and Second grade-late summer. Each classroom learned a few attributes about each choice and then voted on which butterfly garden plant they would like to plant in the spring. This insured that the ELC butterfly garden would have a wide range of color and bloom time throughout the growing year. (The soil in this area had already been identified as clay loam by second grade students and was used as a criteria in choosing which butterfly garden species to include with the cards).

Subproblem Four

The fourth subproblem was to develop cross-curricular learning materials in relation to the restored prairie.
The entire Marshall School District updated its curriculum by undergoing a revisioning "mapping" process during the 1998-1999 school year. As a result, the area of environmental education surfaced as a subject in need of organization and grade level benchmarks. It was ideal timing for the restored natural area to surface as a common project and link to environmental education throughout each grade level. The mapping process identified specific science related EE topics in need of cohesion for grades PK-2. They were:

- PK-insects, shapes textures, colors and seasonal attributes
- K-data collection, graphing and plant structure
- 1-plant attributes and functions
- 2-rocks, minerals and soils

This information was very important to the restoration project because teachers had no cohesive curricula for EE that built upon prior knowledge. Therefore, the EP team immediately worked on grade level objectives for EE that centered on the restored natural area. This provided the much needed structure, interest and incentive for environmental education as well as the incorporation of numerous state standards. This also proved to be a great opportunity to incorporate all subject areas, not just EE, with the prairie restoration.

As stated several times throughout this project, the Earth Partnership program was crucial to the formation of curricular activities and hands on experiences provided to staff, in the form of inservices, with the hope that teachers would use the information and ideas with their students. The EP team decided to make a Prairie Pack (an activity
binder and backpack full of equipment) for use in exploring the natural area and school grounds. Within the activity binder, different activities incorporating all subject areas, as well as state standards being addressed, were outlined. The Prairie Pack was made available for any teacher to “check out” on a daily basis. The activities, as well as corresponding equipment, are listed in Appendix F.

The Prairie Pack was presented at an ELC staff meeting to the entire PK-Second grade staff. Three morning mini inservices were offered and scheduled as teachers volunteered interest and availability. In May of 2002, each classroom voted for a particular native species, to plant in front of the ELC in order to create a butterfly garden. By starting small and utilizing the idea of “nearby nature”, ELC students had the opportunity to gradually become familiar with native butterfly garden species. As the MAHS and MSD continue to work together to restore Box Elder school and natural area, the ELC students should have a solid idea of what they’re planting and why.

Subproblem Five

The fifth subproblem was to provide inservice training opportunities for staff members in prairie restoration and infuse it into current curricula.

As stated previously, providing inservice training met with very limited success. Due to complications of procuring a site for the restoration efforts, Marshall’s Curriculum and Instruction Coordinator, Tim Peterson (who schedules district inservice programs), felt it best to wait until a restoration site was established. With the referendum for the new elementary school passing in February of 2001, Box Elder
School has been verbally “guaranteed” an official site location by the District Superintendent, David Schuler. The MAHS plans to begin its reconstructive efforts in the summer of 2003. Upon the completion of Box Elder Schoolhouse, the MSD is scheduled to plant its natural area. Mr. Peterson has agreed to provide inservice opportunities during the following academic year, 2003-2004, utilizing the Earth Partnership staff through the UW-Arboretum as presenters.

Because of the failure to obtain district wide time for restoration inservices, the EP team held three independent mini inservices before school in order to assist ELC teachers in learning more about butterfly gardens in general, and their own classroom species chosen in particular. The EP team also wanted to generate interest in the Prairie Pack. The Prairie Pack gave every staff member immediate access to observational equipment and detailed curricular activities to use with students outdoors or in the classroom. Each activity incorporated state standards and strived to be cross-curricular in order to cover more than one subject area at a time.

The mini inservices were well attended. The Prairie Pack was checked out by almost every staff member in the ELC. Comments included on the feedback form stressed the idea that most teachers felt they didn’t “know enough” about native plants to utilize the butterfly garden effectively, much less incorporate it into existing curriculum. With the support of the Prairie Pack, teachers were more inclined to take their students outside and try an outdoor activity that supplements what they are already teaching in the classroom. The Prairie Pack comments proved to be helpful in securing inservice time for teachers in the fall of 2003 because they clearly illustrated teachers’ concerns, as well as appreciation, for the added curricular aid.
IMPLICATIONS, CONCLUSIONS, AND RECOMMENDATIONS

Subproblem One

To obtain support of administration, staff and community members in developing and implementing a native plant community.

Building and obtaining *verbal* support happened naturally within the ELC and amongst interested parents and community members. Garnering *active* support, however, was much more challenging.

A goal of this project continues to be a sense of collective ownership, as well as responsibility, regarding the landscape of the ELC and the butterfly garden itself. Teachers trained in the Earth Partnership program promoted active involvement with their students, but failed to move beyond those directly involved with the prairie restoration process. The EP team was unable to secure district wide inservice time to promote environmental education. Without scheduled time, the EP team counted on fellow teachers to utilize their “spare” time to train themselves and become involved.

Promoting support for an active, hands-on project such as this needs to be well rounded. The butterfly garden, Box Elder School and Prairie Restoration have been written up in the Waterloo Courier and the Marshall School District Newsletter. For the past three years, ELC students have been planting bulbs, flowers, shrubs and native plants directly in front of the ELC. There are still parents and community members who are unaware of the student and staff efforts involved in actually maintaining the school grounds. Inviting parents and community members to help weed and mulch on scheduled
work days, as well as incorporating students in middle and high school as part of their service learning requirements, will continue to build support (and help maintain) the site.

**Subproblem Two**

To procure a site for a native plant community for use by all of the schools in the Marshall School District.

The native plant community’s use and incorporation into the curriculum is directly dependent upon where the actual site is located. Establishing the butterfly garden on school grounds has several advantages. Students may see and relate with the species garden on a daily basis. Teachers may incorporate the outdoor classroom with quick activities or lessons that span the length of several days. Seasonal comparisons are easily executed because travel time and weather are not a factor in utilizing the site. The Marshall School Board agreed that the site should be located on school grounds, however the exact spot could not be agreed upon despite numerous meetings. Because the Marshall Historical Society wanted its schoolhouse to become a permanent fixture on school district property, the school board had tremendous difficulty agreeing on an official location.

Working with three (now four) different district administrators in seeking closure to procuring a site was certainly not helpful. Marshall’s former District Administrator, David Schuler, included the reconstruction of Box Elder Schoolhouse in the new elementary school’s referendum. It was agreed that the existing, soon to be demolished, 3-5 building, become the site for Box Elder Schoolhouse and restored prairie.
Selecting the site is a very important procedure which involves the history of the land. Working with the Marshall Historical Society is an incredible advantage. Late 1800’s surveyor maps show the current school district property was prairie/oak savanna. At the turn of the century, the maps indicate the land was bought by the Herman family. Descendants of this family still live in Marshall today. In fact, the Herman family still owns the land adjacent to the district as well.

Unfortunately with elementary students, site selection does not promote much direct involvement. Older students could choose to survey community members and/or fellow students on where Box Elder Schoolhouse and restored prairie could be located. This information could be presented at a board meeting with soil samples and slope information included. Because the site selection process has taken far longer than expected, the EP team felt a butterfly garden should be established and located in front of the ELC to garner interest and support from community members. It will serve as a species garden for the prairie restoration to be planted in the fall of 2004.

Subproblem Three

To restore a native plant community for use by all of the schools in the Marshall School District, focusing on grades Prekindergarten through second grade.

Due to the length of time in procuring a site, the restoration process has not even begun. Instead, a butterfly garden has been developed and planted by PK-2 students. It will serve as a species garden for the prairie restoration scheduled for planting in the fall of 2004.
Second grade students determined the soil in front of the ELC was a clay loam and deemed it suitable for a variety of butterfly garden plants. Each classroom in the ELC adopted a native plant in the spring of 2002 which was planted in May of the same year. Plants were organized by bloom time and divided by grade level. Each classroom planted five plants. Students worked together to create flags to label their flowers so community members could identify what had been planted.

Establishing a butterfly/species garden, utilizing plants rather than seeds, is advantageous for PK-2 students. The results are immediately gratifying. Several of the plants actually bloomed this spring/summer such as spiderwort, liatrus and smooth penstemon. With the butterfly garden's immediate success in growth and beauty, students have the opportunity to become familiar with these particular plants without having to wait several years for the seeds in a prairie restoration to germinate and bloom. Starting small is also helpful to fellow teachers who are learning about native plants for the first time. Together, students and staff members can develop their knowledge and interest in the small butterfly garden in order to see its value and importance in a larger context as a restored prairie.

**Subproblem Four**

To develop cross-curricular learning materials in relation to the restored prairie.

It is necessary to support teachers, especially those with no background knowledge of native plants, in their efforts to incorporate EE material into their existing curriculum. Staff members need encouragement and inspiration in order to integrate new
material and utilize an outdoor site. The Prairie Pack, a collection of prairie restoration curricular materials, was developed because a majority of Marshall School District teachers expressed an interest in more experience working with native plants. The Prairie Pack is available to PK-2 teachers on a check out basis from the ELC library. It provides some background knowledge on prairie restoration as well as sequential learning activities specific to each grade level. It is organized by each grade’s science objectives, but also includes various activities of interest that can be incorporated into any subject and built upon, as student’s skills increase with age and personal development.

An informal survey was given to teachers after they had used the Prairie Pack. It asked which activities students experienced. The survey requested additional information regarding how the Prairie Pack can be even more useful. Survey feedback found that most teachers incorporated the Earth Partnership activities that were self-explanatory and required little to no background knowledge of native plants. Teachers commented that in order to use the Prairie Pack effectively, they needed inservice time on becoming more familiar with the prairie restoration process. Staff member comments indicated a high interest level, but with reservations due to a lack of time. Teachers felt challenged to explore the Prairie Pack thoroughly and integrate its activities effectively. Several teachers expressed a desire for common planning time to focus on how each grade level could incorporate the Prairie Pack together.

**Subproblem Five**

To provide inservice training opportunities for staff members in prairie restoration and infuse it into existing curricula.
Let's Go Native staff surveys indicated a desire for developing and utilizing the outdoor site, as well as a need to receive inservice training. This concern was addressed through the development and availability of the Prairie Pack, as well as the training of five teachers and two community members in the UW-Madison Arboretum’s Earth Partnership Program. These teachers continue to pursue district-wide inservicing on EE in general, and more specifically in prairie restoration.

The EP team conducted three mini-inservices in the spring of 2002 to introduce teachers to the Prairie Pack. Brief background information was shared regarding the Earth Partnership program and the prairie restoration process. Select activities were demonstrated and questions were answered. These mini inservices were scheduled in the mornings before school. All the teachers in the ELC attended one of the three inservices and were genuinely interested in participating in the prairie restoration. Each teacher expressed concerns about time. Most staff members felt they did not have the extra time to learn about native plants and the prairie restoration process. Without that time, teachers felt some discomfort trying to explain material they didn’t know very well to their students. The EP team stressed that the activities in the Prairie Pack did not require any background knowledge in native plants. The purpose in planting the butterfly garden and learning about it was not to become classification experts, but to generate an interest in, as well as an appreciation for, the natural beauty and interdependence a prairie community brings to a landscape. As the EP team continues pursuing district-wide inservice time, this issue needs to be continually addressed.

The EP team also encouraged teachers to come to school on a Saturday morning for a weeding and mulching session. Teachers were asked to share this opportunity with
parents in their classroom, via a phone call or a request in the class newsletter. This effort was met with very limited success. Five of the sixteen teachers in the ELC volunteered their time to beautify school grounds. Only six ELC families came to school on a Saturday to assist in the landscaping project. Greater effort must be made to encourage staff, as well as community members, to participate in collectively landscaping the ELC and taking pride in its accomplishment.

**Conclusions and Future Goals**

Even after five years of native planting groundwork and meeting with the Marshall Area Historical Society, this project is still in its beginning stages. Active support and use of the butterfly garden has only just begun. It is the hope of the EP team that as the species garden generates interest and use, teachers will become more directly involved with the upcoming restoration of Box Elder Schoolhouse and prairie.

Along with this hopeful sense of interest in native plants, teachers will need inservice time. Once the existing elementary school is demolished, the MHS would like to start reconstructing its original one room schoolhouse. The EP team plans to conduct its own inservice for the rest of the Marshall School District, along with the Earth Partnership staff from the UW-Madison Arboretum, in the spring of 2004. Depending upon the amount of time it takes to reconstruct Box Elder Schoolhouse, students will plant prairie seeds the following fall.

The Prairie Pack will be continually updated. Teachers who utilize the Prairie Pack, or add ideas of their own to the activity guide, will be highlighted at staff meetings.
The EP team will strive to set examples of successful experiences conducting outdoor activities which focus on the butterfly garden. Familiarity of this small space should transfer successfully to a larger and more diverse prairie restoration.

The butterfly garden will need to be tended and improved to make it more useful to teachers and students, as well as set the stage for the prairie restoration to come. Working in partnership with the Marshall Area Historical Society insures a sense of collective ownership in developing and maintaining the restored prairie. The MHS has applied for a grant from the Dane County Cultural Affairs Commission that has been approved once the Marshall School District gives Box Elder Schoolhouse an official location. Further financial support for the restored schoolhouse and prairie may come from the Marshall PTA, service learning groups and EE grant opportunities.

The implementation of EE must be strengthened. Currently this is the only unifying effort to incorporate successive EE standards into the elementary curriculum. Active administrative support must continue being sought by teachers, parents and community members in order for every staff person to understand and utilize the outdoor experiences the Marshall School District has available now, so they may work together on the endless possibilities to come.
REFERENCES CITED

Cline, Beverly. (1993) Planning and Implementing Effective Staff Development Programs ED 372 538.


REFERENCES NOT CITED


MARSHALL AREA HISTORICAL SOCIETY
Monday, February 8, 1999

ADGENDA

Call Meeting to Order (7:00PM)
1). Secretary's Report
2). Treasurer's Report
3). Membership Report (June Doyle)
4). Any other Officer business

Committee Reports
1). Program Committee
2). Fund Raising Committee
3). Finance Committee
4). Archive Committee
5). Publicity

PROGRAM:

Old Business
1). Entertainment Books (Rev David Plocher)
2). Garage Sale (Nancy Biegel)
3). Restored Prairie & Box Elder School Restoration- (Jamie Collins, Wayne Kiefer, Mike Schmitt)
3). New location remodeling (?)

New Business

Adjourn Meeting

Goals and Projects for 1999
Reconstruct Box Elder School & Begin Restoration
Remodel new home of "M.A.H.S."
Genealogy Workshop-Spring
M.A.H.S Membership Cards
1). Box Elder Schoolhouse (Reconstruction)  
   Wayne Kiefer-Mike Schmitt

2). Restored Prairie  
   Wayne Kiefer-Mike Schmitt -Jamie Collins

3). Fund Raising (Brainstorm Ideas to Raise Funds)  
   Nancy Biegel

4). Membership(Track current members-Add members)  
   June Doyle

5) Program  
   Nancy Biegel  
   Pat Hilts

6) Archives (Catalog and Inventory Properties)  
   Rev David & Naomi Plocher

7) Finance (Follow Funds and Finances)  
   President-Mike Schmitt  
   Treasurer-Roger Johnson

8) Projects Committee(Formulate procedures for projects)

9) Publicity/Newsletter (Inform Public and Membership)

10)Research Committee

11)New Location Committee  
   Stan Trachte  
   Mike Schmitt  
   Nancy Biegel  
   William Skala  
   Naomi Plocher  
   Janet Kracher
PUBLIC NOTICE is hereby given to the public and news media pursuant to Wisconsin Laws that a REGULAR meeting of the School Board of Jt. School District No. 2, Village of Marshall, Towns of Cottage Grove, Deerfield, Medina, Sun Prairie and York, Dane County, Wisconsin will be held on MARCH 17, 1999 commencing at 8:30 p.m. at the regular meeting place of said School Board in the district office located in the Marshall Early Learning Center (369 School Street) in the Village of Marshall, Dane County, Wisconsin and that the preliminary agenda for said meeting is as follows:

AGENDA
1. Call meeting to order
2. Roll call of the board
3. Approval of agenda
4. Recognition of visitors
5. Proof of giving public notice
6. Approval of board minutes dated February 17, 1999
7. Approval of receipts and expenditures
8. BUSINESS:
   1) Construction update.
   2) Discuss and approve collaborative project with Marshall Historical Society.
   3) Discuss and approve College for Kids.
   4) Approve contract for a vacant High School Assistant Track coaching position.
   5) Consideration and approval of administrative contracts.
   6) Discuss and approve contract for lawn mowing.
   7) Accept resignations.
   8) Discuss and approve Wisconsin Youth Options Program.
   9) Discuss and approve Scholarship Fund.
   10) Discuss legislative issues and vote on any necessary resolutions.
   11) Approve request for extended maternity leave.
   12) Approve request for attendance at national convention.
   13) Approve summer school dates.
   14) Other business.
9. REPORTS:
   Discuss Village Partnership Committee Report.........................
   Michael Davis......................................................................District Administrator
   Sanford Swiggum.............................................................Pupil Services Director
   Mary Ellen Neupert........................................................Business Manager
   Kim Kaukl.........................................................................High School Principal
   Robert Seyffer.....................................................................Middle School Principal
   Robert Opps.......................................................................ELC/Elementary Principal
10. ADJOURNMENT
    The Board by vote may take action on any or all items listed in the agenda. These are the items known at this time. Adjustments may be made up to 24 hours prior to board meetings. Changes will be posted at each school site, post office, Bergholz Grocery, F&M bank, Marshall Sausage IGA and Martins Feed.

DATED: March 12, 1999

ADDED: TUESDAY, MARCH 16, 1999
#11 Request for extended maternity leave
#12 Request to attend national convention
#13 Approve summer school dates
PROPOSAL:

It has been proposed that the Marshall Public School District work in partnership with the Marshall Historical Society in:

1) Restoring the original Box Elder one room schoolhouse
2) Developing one half acre of surrounding land into its original state; native prairie/oak savanna.

The proposed location for this restoration project is the southeast corner of the ELC, adjacent to the district office’s parking lot and Hwy 73, east of the track and bordering the Herman farm to the south.

Why a prairie restoration?

It’s a curricular need.

• In 1997, the science curriculum committee, in developing its standards, identified environmental education as an area in need of serious enhancement.
• A restored prairie, on school property, would supplement the PK-5 curriculum by providing an accessible, hands on, outdoor classroom for any grade level which can be utilized throughout the year and incorporate different subjects.

It’s a school-community partnership.

• It is an educational opportunity for all ages to work together through direct experience.
• Historical society members and volunteers will be responsible for the cost and labor of restoring and maintaining the Box Elder schoolhouse.
• Marshall School District personnel and students will be responsible for establishing and maintaining the restored prairie. Custodial staff will continue to mow grassy areas regularly.

It’s an ecological necessity.

• Less than 1/10 of 1% of native prairies remain in Wisconsin. The near extinction of entire ecosystems makes restoration urgent.
• It will provide a natural landscape, not only for plants and grasses, but butterflies, birds and insects that students may not be exposed to on a regular basis.

How will it look?

• It will be an area of land with trails, seating areas and “buffers” (a surrounding mowed area, or split rail fence) to identify this area as a restoration project.
• A concentrated effort will be made to make the Box Elder school and restored prairie look “maintained” as soon as possible.

What about the cost?

• Summer school students can collect seeds for free at the UW Arboretum and Langer Park.
• Teacher training is available through the Earth Partnership program at the UW Arboretum.
• Some Service Learning monies may be set aside for this collaborative effort.
• The Marshall Historical Society will cover all costs regarding Box Elder School.

Thank you for your consideration and interest in this joint community school effort!
Historical society presents project

By Janet Kracher
Marshall-Writer

Representatives of the Marshall Area Historical Society, Jamie Collins of the ELC staff, and Dan Unruh, father of an ELC student, attended the March meeting of the Marshall-District School Board. The group asked board approval for a joint project that will involve using part of the school campus.

The historical society would like to place the restored Box Elder School House on school property along Deerfield Road, and Collins would like to create a prairie plantation as a setting for the school house.

Collins presented a series of colored slides that showed typical prairie plants and flowers from early spring until late fall. She also provided board members with a layout map showing the position of the school house in relation to the proposed prairie and the paths where children can walk and observe the plants and small animals.

Unruh talked about how much his children and their friends have enjoyed the 1/3 acre prairie he planted at his home. He said the prairie has attracted several small animals and provided the neighbors’ children with material for several science projects.

The board gave preliminary approval for the project. Final approval will come after the district’s legal firm, Lathrop and Clark, and an attorney for the historical society work out a contract that defines the responsibilities of both parties to the agreement.

In his construction update George Fantauzza of Dana Larson Roubal told the board that the bonding company covering the Schmidke bankruptcy has now paid out $90,000. Speaking of the bonding process, Fantauzza remarked, “It delayed the project, but it worked.” Fantauzza also reported that gas piping for the convection oven in the foods lab is being installed and electricians have nearly finished the additional electrical circuits and outlets for the building. He also said he has received a request for a water heater in the science wing.

Miron Action Co. has some landscaping to finish this spring, and some manuals need to be handed in, so Fantauzza is still holding some retainage. The building fund still has $80,000 in it. Fantauzza gave credit to competitive bidding and the low bids it produced and to Mary Ellen Neupert for getting very low interest rates on the loans.

Neupert reported that ten mowing companies submitted bids for mowing the school grounds. Bids ranged from $360 to $1,650 per

(Continued on page 12)
The Marshall School District, Marshall Area Historical Society and Marshall PTA are working together to bring the Marshall community its own...

**Little Schoolhouse on the Prairie**

The Marshall Historical Society’s restored schoolhouse will include:

- A full basement for heating/cooling and storage purposes
- Actual dimensions of the original Box Elder School
- Preserved materials and historical memorabilia from Marshall’s first country day school, Box Elder

The Marshall School District has been accepted into the UW-Arboretum’s Earth Partnership program which will include restoring one half acre of land surrounding Box Elder School into a natural prairie. This program provides:

- Teacher training on prairie restoration
- Integration into the curriculum involving all subject areas
- A collaborative, hands on partnership with UW-Madison scientists where students contribute to actual research and data collection

Together, this joint effort provides Marshall:

- An opportunity to preserve the educational and ecological history of Marshall’s first schoolhouse and its surrounding environment
- A school-community partnership available to all Marshall residents
- An investment in the past to share with the future

Please let your neighborhood school board member know if you support this community oriented, hands on ecological restoration. It not only preserves some of Marshall’s local history, but secures its future in keeping part of its past alive for many generations to come.
Appendix B
Date: March 20, 2000

To: Mike Schmitt
   Jamie Collins
   Gene Davis
   Dave Grady

From: Mike Davis

Topic: Committee Meeting

A district Buildings and Grounds meeting has been scheduled for Wednesday, April 5, 2000 at 7 p.m. in the District Board Room.

At this meeting, we will be discussing an agreement with the Historical Society to place a renovated one-room school on school property.

Enclosed you will find copies of information that will be discussed.

sh
enclosures 3
June 17, 1999

Mr. Michael Davis
District Administrator
Marshall Joint School District No. 2
P.O. Box 76
Marshall, WI 53559-0076

Re: Draft Easement Agreement to be Used as Basis for further Discussions with the Marshall Historical Society

Dear Mr. Davis:

In accordance with our telephone conference, please find attached a draft Easement Agreement to be used as a basis for further discussions/negotiations with the Marshall Historical Society regarding the Box Elder schoolhouse restoration project. As you requested, I have assembled a document which I do not believe to be onerous with respect to the Marshall Historical Society, and which does not reflect an aggressive negotiation posture. On the other hand, I believe that the attached Agreement does address the primary points you and I discussed over the telephone regarding necessary protections for the School District.

Please keep in mind the points listed below when reviewing the enclosed Easement Agreement:

1. It is important to emphasize to the Marshall Historical Society that this is a draft proposal. As discussions proceed regarding the specifics of the Box Elder school restoration project, it is possible that other issues will arise which we will want to address in the context of the Easement Agreement. Thus, this Agreement should not necessarily be viewed as exhaustive of the terms which we will want to include in the Easement Agreement.
We discussed during our telephone conversation that it would be possible to accomplish the goals of the restoration project by (1) having the Historical Society gift the restored school to the School District, (2) leasing the property to the Historical Society or (3) granting an easement to the Historical Society. Based upon our discussion regarding the parties’ needs and interests, we agreed that granting an easement to the Marshall Historical Society is in both parties’ interests.

Because Wisconsin law does not allow school districts to confer benefits or gifts upon third parties, it will be necessary to determine what constitutes fair consideration for the transfer of the easement to the Marshall Historical Society. Consideration for the easement can take the form of cash or benefits, such as access and use of the restoration site for school purposes. Ultimately, the Board of Education will need to make a determination that the specified consideration reasonably approximates the market value of the easement being transferred to the Marshall Historical Society.

As we discussed, it will be necessary to obtain elector approval of the transfer of the easement. In this regard, we will need to prepare a resolution in which the electors vote to determine that the property that is the subject of the easement is not otherwise needed for school purposes. You have informed me that you wish to seek elector approval at the upcoming annual meeting, rather than pursuing a special meeting specifically for this purpose.

It will be necessary to retain a surveyor to identify a legal description for the site which will be the subject of the easement.

Please note that I have included a provision within the Easement Agreement that allows the School District to give a 90-day notice in the event that the Board of Education determined in the future that the restoration site was needed for the expansion of school facilities. If such notice were given, the site and responsibility for the site, would revert to the School District. We did not discuss this provision during our telephone conversation. Please note that we can retain or remove this provision as desired.
If you have any questions regarding the comments above, or the terms of the attached Easement Agreement, please do not hesitate to contact me.

Very truly yours,

LATHROP & CLARK LLP

Frank C. Sutherland
FCS/blf
Attachment
S/DMr. Michael Davis 06-17-99.doc
EASEMENT AGREEMENT

This Agreement is made this ___ day of _____________, 1999, by and between
the Marshall Joint School District No. 2 (hereinafter referred to as the “School District”) and the Marshall Historical Society, a nonprofit corporation organized under the laws of Wisconsin (hereinafter referred to as the “Historical Society”).

WHEREAS, the School District owns land adjacent to its present school facilities which the School District believes would serve as appropriate land for the construction and restoration of the Box Elder one-room schoolhouse, which land is more particularly described below (hereinafter referred to as the “Historical School Site”):

[INSERT LEGAL DESCRIPTION]

WHEREAS, the Historical Society is desirous of constructing and restoring the Box Elder one-room schoolhouse at the Historical School Site for the benefit of the community in general and for the educational benefit of students who attend the Marshall Joint School District No. 2; and

WHEREAS, the School District and the Historical Society mutually desire to enter into an easement agreement in the manner and form, and consisting of the terms, set forth hereinbelow.

NOW, THEREFORE, in consideration of the mutual and reciprocal covenants hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by the parties, the parties hereto agree as follows:

1. Grant of Easement. The School District does hereby grant, convey, transfer and assign unto the Historical Society an easement over, under and across the Historical School Site, as identified hereinabove. The exclusive purposes of this Easement shall be use of the Historical School Site for the construction, erection, installation, maintenance, operation, exhibition, repair, replacement and reconstruction of the Box Elder schoolhouse, and for the cultivation, installation, maintenance, exhibition and replacement of native vegetation on the Historical School Site. The School District shall permit the Historical Society reasonable access to the Historical School Site across adjacent lands owned by the School District in order to facilitate the Historical Society’s use of the Historical School Site for the purposes set forth above.

2. School District Use. Notwithstanding the purposes stated above, the Historical Society hereby agrees that the School District shall have continuing and
omissions of the Historical Society, its members, employees or agents, or any participant, patron, visitor, guest or invitee who is present upon the Historical School Site.

7. No Assignment. The parties hereby agree that the Easement described herein may not be assigned unless the Historical Society first obtains the express written consent of the School District.

IN WITNESS WHEREOF, the parties have placed their hands and seals on the day and year first above written.

MARSHALL JOINT SCHOOL DISTRICT NO. 2

By: ________________________________ (SEAL)
President

Attest: ________________________________
Clerk

STATE OF WISCONSIN )
) ss.
COUNTY OF DANE )

Personally came before me this ______ day of ____________, 1999, the above-named ___________________ and ___________________, to me known to be the persons who executed the foregoing instrument and acknowledged the same.

________________________________________
Notary Public, Dane County, Wisconsin.
My Commission: __________________________.
MARSHALL HISTORICAL SOCIETY

By: ___________________________ (SEAL)
    President

Attest: _________________________
    Clerk

STATE OF WISCONSIN )
    ss.
COUNTY OF DANE )

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Notary Public, Dane County, Wisconsin.
My Commission: ________________________

S:\Marl\Canceled Agreement 06-99.doc
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WHEREAS, the School District and the Historical Society mutually desire to enter into an easement agreement in the manner and form, and consisting of the terms, set forth hereinbelow.

NOW, THEREFORE, in consideration of the mutual and reciprocal covenants hereinbelow set forth, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by the parties, the parties hereto agree as follows:

1. Grant of Easement. The School District does hereby grant, convey, transfer and assign unto the Historical Society an easement over, under and across the Historical School Site, as identified hereinabove. The exclusive purposes of this Easement shall be use of the Historical School Site for the construction, erection, installation, maintenance, operation, exhibition, repair, replacement and reconstruction of the Box Elder schoolhouse, and for the cultivation, installation, maintenance, exhibition and replacement of native vegetation on the Historical School Site. The School District shall permit the Historical Society reasonable access to the Historical School Site across adjacent lands owned by the School District in order to facilitate the Historical Society’s use of the Historical School Site for the purposes set forth above, as discussed b/f the parties.

2. School District Use. Notwithstanding the purposes stated above, the Historical Society hereby agrees that the School District may be granted

...
uninterrupted access to the Historical School Site during school hours, for the purpose of using the Historical School Site for educational purposes. The parties further agree that additional access to the Historical School Site during non-school hours may be granted to the School District from time to time by the Historical Society, and that authorization of such access shall not be unreasonably withheld.

3. Maintenance and Repair. The Historical Society hereby agrees to be responsible for all maintenance, supervision, repair, landscaping and other work required in connection with the Historical School Site. The Historical Society agrees to maintain said Site in a professional manner and in a manner which is compatible with the appearance of adjacent lands owned by the School District. In addition, the Historical Society agrees to promptly restore to its original condition any of the land adjacent to the Historical School Site disrupted or displaced by use of the Historical School Site by the Historical Society or any of its agents, employees, members, participants, patrons, guests or invitees. Exclude any disruption or displacement.

4. Term of Easement. The Easement described herein is perpetual in nature subject, however, to the following exceptions:

a. In the event that the Historical Society ceases to operate or exist, the Easement described hereunder along with any structures or facilities situated thereon shall automatically revert to the School District upon said event.

b. If the Board of Education of the School District determines in the future that the Historical School Site is needed for the expansion of school facilities, the School District may terminate this Easement by delivering a 90-day written notice to the Historical Society notifying the Historical Society of the same. Upon expiration of said 90-day period, the Easement described herein shall automatically revert to the School District along with any structures or facilities situated thereon.

5. Insurance. The Historical Society hereby agrees to assume responsibility for and obtain property and liability insurance sufficient to protect against risks associated with the maintenance and use of the Historical School Site.

6. Indemnification. The Historical Society hereby agrees to hold harmless, defend and indemnify the School District, its officers, employees and agents from and against all claims, liability, loss, demands, causes of action, damages, costs and attorney fees, of any kind or nature, arising from or incident to the maintenance and use of the Historical School Site by the Historical Society, whether resulting from the acts or
omissions of the Historical Society, its members, employees or agents, or any participant, patron, visitor, guest or invitee who is present upon the Historical School Site.

7. No Assignment. The parties hereby agree that the Easement described herein may not be assigned unless the Historical Society first obtains the express written consent of the School District.

IN WITNESS WHEREOF, the parties have placed their hands and seals on the day and year first above written.

MARSHALL JOINT SCHOOL DISTRICT NO. 2

By: ____________________________ (SEAL)
    President

Attest: __________________________
    Clerk

STATE OF WISCONSIN    )
    ) ss.
COUNTY OF DANE        )

Personally came before me this _____ day of ____________, 1999, the above-named __________________ and __________________, to me known to be the persons who executed the foregoing instrument and acknowledged the same.

__________________________________________

Notary Public, Dane County, Wisconsin.
My Commission: ____________________________
MARSHALL HISTORICAL SOCIETY

By: __________________________ (SEAL)
    President

Attest: __________________________
        Clerk

STATE OF WISCONSIN  )
      ) ss.
COUNTY OF DANE      )

Personally came before me this _____ day of ____________, 1999, the above-named ______________________ and ________________________, to me known to be the persons who executed the foregoing instrument and acknowledged the same.

__________________________________________

Notary Public, Dane County, Wisconsin.
My Commission: ____________________________
TO: Mike Schmidt

Mike This is site map of old school use site. The proposed bldg will have to go at least 25 ft from higway. Either sketch on new easement lines or call me with dimensions needed

D.R

We will probably rotate the building and set parallel to the setback line,

Mike
At 7:10 p.m., the MAHS members went to the public hearing re: the proposed library site in Deerhaven. Discussion followed. The public hearing ended at 7:40 p.m.

Pres. Schmitt called the meeting to order at 7:50 p.m.


Membership. Judy Brinkman presented a current list. Will try to have one for the members next month.

Old Business. Pres. Schmitt met with the building and grounds committee last Wednesday re: the Box Elder Schoolhouse. Jamie Collins has gotten a grant to do a restored prairie from Earthland Preservation. Pres. Schmitt talked of school placement. Mike Davis is behind the plans for the school. Mr. Zimmerman's class will do the foot bridge. Pres. Schmitt read excerpts from agreement with the school re: the Box Elder Schoolhouse. Lathrop & Clark are the attorneys for the school. Frank Sutherland is the lawyer working on the agreement for the school. Our lawyer, Gary Meloy, will review it also. If the MAHS ceases to exist, the school would take over the Box Elder Schoolhouse.

Box Elder Schoolhouse. Wayne Kiefer & Wm. Skala have measured & established the width & length of the schoolhouse. Need to find the window dimensions. Mr. Zimmerman's class will draw up plans. Wayne Kiefer will take those to an architect to have the plans drawn up professionally. Then the County & the Village will need to approve. Bill Blaschka will dig the basement hole. Discussion followed re: laying basement foundation, the potential need to get an exception for having sewer excluded and what we need bids on. The basement is 22' x 30'. 660 sq. ft. & the entry way. Wayne Kiefer will contact Karen Jones to see if she has photos from the BESH dismantling. Wm. Skala will check with Stan Trachte to see if he has pictures. Pres. Schmitt suggests asking public to come forward with BESH memories.

Fund Raising & Publicity. Will need to look at both re: BESH project.

Pres. Schmitt reminded us that final approval from school needs to come 1st. Bea Rockhill's aunt taught at the BESH.

Pres. Schmitt has talked to Bernie Nikolay re: plates. Bernie will let Pres. Schmitt know where they got them. (for a fund raiser)

Genealogy Workshop. Naomi Plocher spoke for Audrey Kleinschmidt. A survey was done and the majority found it to be very informative. Interest expressed in doing it again.

Motion made by Wm. Skala to adjourn. Seconded by Bea Rockhill. Motion carried. Meeting ended at 8:50 p.m.

Respectfully submitted,

Judy Brinkman, Secretary
Appendix C
Last summer...

Marshall teachers helped with the dig

School was out, but for Jami Collins, Karan Bliske, Rodger Johnson and Judy Brinkman. They joined other educators and community members from all around Wisconsin in an Earth Partnership for Schools Summer Institute sponsored by the University of Wisconsin-Madison Arboretum.

During the two-week, 80-hour workshop, teams of teachers and community members literally got down and dirty with a variety of hands-on activities designed to show them how to teach their students and community ecological restoration — returning the land in their schoolyards to its original state, the way it was before settlers arrived.

In the process, they got tips on how to make the experience meaningful, fun and educational.

Teachers and community members learned how to incorporate math, science, art, music, social studies, history, literature and other curriculum areas into land restoration activities.

Soon, their students and community will get to participate in this hands-on, minds-on approach to learning and watch the changing face of their schoolyard as it develops into an outdoor laboratory that can be shared with the Marshall community.

The Marshall school District is working in partnership with the Marshall Area Historical Society to create some of the past for future students to experience.

Together, they hope to reconstruct Marshall's original one-room schoolhouse and landscape it with native prairie plants right on district property. The entire project involves students, staff and community members of Marshall.

The Earth Partnership for School Program has provided environmental education strategies for students in prekindergarten through high school since 1991.

The program began as an outgrowth of the UW-Madison Arboretum's focus on ecological restoration as a way of establishing a positive relationship between people and the land. This program also helps teachers meet the state mandated requirements in school curricula.

Participants received a resource and activity guide and earned two graduate credits from the UW-Madison.

"We have found that planting a prairie or other ecosystem provides students and communities with rich and personally meaningful opportunities to learn ecological concepts and study natural and cultural history of their school property," said Libby McCann, Earth Partnership for Schools Program Manager.

McCann continued, "Student involvement is grounded in basic science as they design, plant, maintain, and complete their restoration project."

The UW-Madison Arboretum, famous for pioneering restoration initiated by Aldo Leopold and his colleagues in the 1930s, provides living laboratories for restoration-related research and teaching.

The Earth Partnership for Schools Program is sponsored by the UW-Madison Arboretum and funded through the Howard Hughes Medical Institute.

To find out more about the Earth Partnership for Schools project at Marshall School District, contact Jami/Geoff Collins, Rodger Johnson, Judy Brinkman or Karen/Clarke Bliske at (608)655-3466.
Appendix D
LET'S GO NATIVE!

Staff members (did we get your attention?? READ ON!),

Please fill out the following survey and return it to your building secretary no later than Friday, October 12. Please see Jami Collins, Karan Bliske, Holli Viken, Kathy Anderson, Brenda Greene or Roger Johnson (from the Marshall Historical Society) if you have any questions. Use the reverse side of this survey for comments. I know you're all busy so THANK YOU for your time.

1. I feel environmental education is important.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

2. I feel working with local community members and organizations strengthens my curriculum and instruction.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

3. I would like to be involved in a community oriented project which beautifies the school grounds and encourages Marshall citizens of all ages to work together.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

4. I feel student involvement in a school ground beautification project could involve the use of native plants in restoring part of the Marshall School District's lawn to its original prairie state.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

5. I feel a prairie restoration project would be enhanced by working with the Marshall Area Historical Society in reconstructing its one room schoolhouse on school district property.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

6. I would be interested in working with this restoration project and utilizing the outdoor site with my students.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5

7. I would support the use of inservice time to incorporate the prairie restoration project as it relates to my curriculum.
   - Strongly Disagree 1
   - Disagree 2
   - Not Sure 3
   - Agree 4
   - Strongly Agree 5
"Working with local community members and organizations strengthens my curriculum and instruction"
"A prairie restoration project would be enhanced by working with the Marshall Area Historical Society and the one-room schoolhouse"
"I would like to be involved in a community project of this type"
"I would be interested in working with this restoration project and utilizing the outdoor site with my students"
Appendix E
PUBLIC NOTICE is hereby given to the public and news media pursuant to Wisconsin Laws that a REGULAR meeting of the School Board of Jt. School District No. 2, Village of Marshall, Towns of Cottage Grove, Deerfield, Medina, Sun Prairie, and York, Dane County, Wisconsin will be held on January 16, 2002 commencing at 8:00 PM at the regular meeting place of said School Board in the District Office located in the Marshall Early Learning Center (369 School Street) in the Village of Marshall, Dane County, Wisconsin and that the preliminary agenda for said meeting is as follows:

AGENDA
1. Call meeting to order
2. Roll call of the board
3. Approval of agenda
4. Recognition of visitors
5. Proof of giving public notice
6. Approval of receipts and expenditures
7. Approval of board minutes dated December 19, 2001
8. BUSINESS
   a. FFA National Convention Trip Review
   b. Presentation of Prairie Restoration Project
   d. Discussion and Potential Action regarding extended maternity leave request
   e. Discussion and Potential Action regarding Potential New Course Offerings
   f. Approve Resignations
   g. Offer Contracts
9. REPORTS
   Committee Reports ..............................................................
   Village Partnership Committee Report ...........................................
   Sanford Swiggum .................................................................Pupil Services Director
   Tim Peterson ........................................................................Instructional Support Leader
   Mary Ellen Van Valin ...........................................................Business Manager
   Mitch McGrath ......................................................................Interim High School Principal
   Tammy George .................................................................Middle School Principal
   Bernie Nikolay ....................................................................Elementary Principal
   Robert Opps ........................................................................ELC Principal
   David Schuler ....................................................................District Administrator
10. ADJOURNMENT
The Board by vote may take action on any or all items listed in the agenda. These are the items known at this time. Adjustment made up to 24 hours prior to board meetings. Changes will be posted at each school site, Post Office, Tom’s Guns, F&M Bank, Marshall Sausage IGA, Marshall Public Library, and Martin’s Feed.

Dated: January 11, 2002
TOP 10 REASONS WHY...

Marshall School District should restore Box Elder School and its surrounding landscape.

10- Harvey Wedeward is storing it in his barn and he’s not getting any younger.

9- It is a completely unique school community partnership.

8- Everybody’s doing it.

7- We have the space.

6- It will bring the past alive.

5- It brings cohesion to Marshall’s environmental education.

4- It is an ecological need.

3- Teachers are interested and willing to work on it.

2- It brings the idea of village partnership into ACTION.

1- IT’S FREE!
Membership
Membership in the Marshall Area Historical Society is open to anyone who wishes to join especially those who are interested in the history of the Marshall area. For new member application form see reverse side.

Museum 321 William Street, Open
First and Third Tuesdays each month, 1 PM to 3 PM. January 2002 to May 2002
At other times by appointment

Board of Directors Meetings
All members and guests invited to each meeting.
The February 11, 2002 meeting will be held at the Museum, 321 William Street. The meeting will begin at 6:30 PM with a short business meeting followed by a working session for arranging and cataloging historical materials. Please come to help us get our files up to date.
A spring field trip to Aztalan Museum will be discussed at the February 11 meeting. This trip was postponed last fall.
Watch The Courier for upcoming speaker nights. We also plan to have Historical Societies from other area communities with us to exchange ideas and stories. The public will be invited to these events.

Projects in Process
Box Elder Grove School preservation
Box Elder Grove School history
Deansville Post Office History

Activities
GARAGE SALE: It is not too early to be planning for the June 2002 Village wide garage sale. Start cleaning out your attics, closets and garages to provide items to include in our “Store”!

Help Wanted
Museum Docents and Archival Assistants.
Call Nancy at 655.3610

Box Elder Grove School preservation and Future museum space
David Schuler, Administrator of the Marshall School District, attended our meeting on January 14, 2002 presenting the District’s plan for a new elementary school building and the removal of all of the buildings presently associated with elementary school use. These plans include two items involving our future, they are:
1. A site for the reconstructed Box Elder Grove School House will be available in the grassy and black top area north of the present elementary school in the vicinity of the flag pole.
2. Space will be available in the new elementary school building or in the middle school building for Marshall Area Historical Society museum and meeting space when the building we are presently using will be demolished.

At the time we receive permission to start the Box Elder Grove reconstruction we will need a substantial amount of funds to pay for materials and labor to complete the reconstruction project. There may be materials and equipment that could be salvaged when the present elementary school buildings are removed but that may be only a small amount of the cost of the reconstruction project.

Deansville Cemetery Inscriptions Report
The report has been printed. Copies are available for inspection by interested parties at the Marshall Historical Society Museum, Medina Township Hall, Marshall Community Library, Sun Prairie Historical Library and Museum, Karl Juninger Memorial Library at Waterloo, City of Monona Library, City of Madison Central Library and the Wisconsin Historical Society Library
Appendix F
<table>
<thead>
<tr>
<th>Level</th>
<th>Prairie Definition and Introduction</th>
<th>Human Habitation and Cultural History</th>
<th>Prairie Plants</th>
<th>Prairie Insects, Birds and Mammals</th>
<th>Ecosystem Interactions</th>
<th>Restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td>* Read and listen to accounts from early settlers (18)</td>
<td>* Create an identification booklet with solar graphics (42)</td>
<td>* Brainstorm how animals use the prairie (55)</td>
<td>* Make and record monthly observations from a single prairie spot (60)</td>
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</table>

**Language Arts**

<table>
<thead>
<tr>
<th>Social Studies</th>
<th>* Read and listen to accounts from early settlers (18)</th>
<th>* Monarch Chrysalis and Butterfly: determine migration route, compute migration miles (52)</th>
</tr>
</thead>
</table>

| Art/ Music | * Design a prairie celebration (16) | * Variation of "Farmer in the Dell" to introduce prairie plants (36) | * Monarch Chrysalis and Butterfly: model life cycle stages (52) | * Make and record monthly observations from a single prairie spot (60) |
|-------------|------------------------------------|----------------|-----------------------------------|-----------------------|------------|
|             | * Make and use dyes from prairie plants (19) | * Create prairie grass crayon rubbings (31) | * Listen to "Flight of the Bumblebee" and create your own insect symphony (48) |
|             | * Design a prairie celebration (16) | * Create an identification booklet with solar graphics (42) | * Monarch Chrysalis and Butterfly: model life cycle stages (52) | * Make and record monthly observations from a single prairie spot (60) |
## Prairie Ecology and Restoration: Scope and Sequence

<table>
<thead>
<tr>
<th>Level</th>
<th>Prairie Definition and Introduction</th>
<th>Human Habitation and Cultural History</th>
<th>Prairie Plants</th>
<th>Prairie Insects, Birds and Mammals</th>
<th>Ecosystem Interactions</th>
<th>Restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td>* Make and use dyes from prairie plants (19)</td>
<td>* Learn plant parts through &quot;Back-to Back&quot; movement game (25)</td>
<td>* Visualize and describe life as a prairie ant (46)</td>
<td>* Dissect and examine prairie soil (78)</td>
<td>* Collect seed from a restoration or remnant for the prairie (83)</td>
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<td>* Variation of &quot;Farmer in the Dell&quot; to introduce prairie plants (36)</td>
<td>* Observe butterfly pollination and nectar collecting behavior (47)</td>
<td>* Make and record monthly observations from a single prairie spot (60)</td>
<td>* Monarch Chrysalis and Butterfly: observe (52)</td>
<td>* Make and record monthly observations from a single prairie spot (60)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Create prairie grass crayon rubbings (31)</td>
<td>* Monarch Chrysalis and Butterfly: observe (52)</td>
<td>* Discuss and sequence various life cycles (56)</td>
<td>* Consider how organisms contribute to the prairie community (70)</td>
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<tr>
<td></td>
<td>* Create an identification booklet with solar graphics (42)</td>
<td>* Grow a prairie plant (37)</td>
<td>* Collect seed from a restoration or remnant for the prairie (83)</td>
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<td></td>
<td>* Identify prairie plants from pictures (34)</td>
<td>* Identify prairie plants from pictures (34)</td>
<td>* Monarch Chrysalis and Butterfly: determine migration route and compute migration miles (32)</td>
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<tr>
<td>Math</td>
<td>* Identify geometric shapes in prairie plants (35)</td>
<td>* Monarch Chrysalis and Butterfly: determine migration route and compute migration miles (32)</td>
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</tbody>
</table>
Prairie Scavenger Hunt: Studying Plant Adaptations

SOURCE: Kathleen Morgen

SUBJECT: \( \square \) SCIENCE \( \square \) MATH \( \square \) LANGUAGE ARTS \( \square \) SOCIAL STUDIES \( \square \) ART \( \square \) MUSIC \( \square \) OTHER

GRADE: \( \square \) K-2 \( \square \) 3-5 \( \square \) 6-8 \( \square \) 9-12


ACTIVITY TIME: 30 minutes minimum

MATERIALS NEEDED: Small bags (one for each 2-3 students) each including a piece of waxed paper, piece of fur, thin green ribbon, doily or "snowflake" cut paper piece and sandpaper

SEASON: Late spring, summer, early fall

OBJECTIVES: Students will:
- understand how a plant's structure can reflect adaptations to its environment
- be introduced to the structure and function of leaves and roots
- observe and begin to recognize several prairie plants

SUMMARY: Students search for certain types of plant adaptations.

SPECIFIC BACKGROUND: Water is often limiting in the prairie environment. In the summer, relatively low rainfall and high temperatures can make water scarce. Additionally, the frozen water of the winter months is unavailable to plants. As a result, prairie plants have many traits that are believed to be adaptations to these low water conditions.

If a plant has a large root (the water-absorbing surface) relative to its top (the evaporative surface from which water is lost) it is well suited to a dry environment. Many prairie plants achieve this with an extensive root system which either spreads laterally up to four feet in every direction or delves deeply with roots that can extend as far as 7 meters into the ground. Large root systems also help the plant access scarce soil moisture. Reduction in the above ground surface area can be seen in finely divided leaves, slender leaves or in a generally small above ground size. Up to two thirds of a prairie plant's total mass is below the ground.

Plants can also adapt to low water conditions through various mechanisms that reduce evaporation of the above ground portion of the plant. These adaptations include vertical positioning of the blades, rolling of the leaf blades, fuzzy hairs on the leaf, water storage in sticky juices, hard coated seeds and a life cycle that can be completed rapidly in early spring when water is relatively abundant.

The items in the scavenger hunt reflect the several low water adaptations.

Earth Partnership for Schools, UW-Madison Arboretum
**Waxy leaf surface** (waxed paper) Waxy coated leaves retain water and retard evaporation. Similar to how chapstick is used to prevent lips from drying out.

**Hairs on leaf surfaces** (piece of fur) Hair reflects sunlight, keeps leaves cooler, creates a local high humidity “boundary layer” on leaf surface.

**Finely divided leaves** (paper doily) Finely divided leaves allow wind to pass, retarding evaporation from the leaf surface.

**Narrow, curled leaf** (green ribbon) Narrow vertical leaf can curl up retarding evaporation from the leaf surface.

Prairie plants have developed adaptations in response to conditions other than drought, such as competition for space, light, and pollinators, as well as conditions of high wind, grazing and fire. However, the drought-related adaptations are distinctive, varied and relatively easy for students to observe and often parallel adaptations for grazing or fire conditions.

Several prairie plants have rough leaves that are thought to deter predators. A piece of sandpaper in the scavenger hunt bag can represent the rough leaf of a Silphium, sunflower or coneflower. The rough leaf is a good example of how a plant’s feature could be an adaptation or could be an artifact of another aspect of the plants development and physiology. For instance, large stoma on the leaf surface might cause roughness that is unrelated to predator deterrence.

Note: If you have poison parsnip in the site for this activity, be sure students recognize it before starting.

**ACTIVITY DESCRIPTION:**

Divide into groups of 3-4, each group receives a bag. How many different plants you can find that have leaf adaptations represented by the objects in your bag? Trace a leaf, sketch the plant or tie a piece of yarn around it to show others. Be careful not to harm the plant. Regroup and compare findings.

**EXTENSIONS:**

- Find example of adaptations to other factors such as competition for space, light or pollinators.
- Create a “perfectly adapted” prairie plant. Build a model of the plant and present it to others. After discussion and examining other students’ work, revise your own plant.
- For each adaptive trait observed, hypothesize a different condition that could have caused the same trait.
- Describe animal adaptations that could have arisen in response to the dry prairie conditions.

**ASSESSMENT:**

- Describe 3 examples of how plant structures are modified due to low water availability and high temperatures.
- How do prairie plants survive drought, high temperatures, and intense sunlight?
- Given the specific adaptations prairie plants have developed in response to low water availability, what kinds of adaptations would you predict plants might develop in response to excess water availability?
Visual Assessment
(A Prairie Through an Artist’s Eye)

SUBJECT: ______ SCIENCE  GRADE: X K-2
MATH  X  3-5
____ LANGUAGE ARTS  X  6-8
SOCIAL STUDIES  X  9-12
ART
MUSIC
OTHER


ACTIVITY TIME: 1 hour

MATERIALS NEEDED: 2 pieces of plain white drawing paper, pencil, and clipboard per student. Colored pencils are optional.

SEASON: Fall is the best time for this activity because the grasses are in seed, but summer and spring will work, too.

OBJECTIVES: Students will:
- practice observation skills
- illustrate their observations with drawings
- interpret and compare contrasting views
- analyze and assess their feelings based on what they see.

SUMMARY: Students will draw the prairie in two different views as they look at it aesthetically, artistically, and historically.

SPECIFIC BACKGROUND:
There are two approaches to aesthetically assess a landscape—vista and close-up views. A vista approach is looking over a distance or a panoramic view. A close-up view is looking at a part nearest the viewer. Each approach influences a different set of feelings and perceptions along with contrasting artistic renderings.

Vista View
An historical account:
"The (vista) view . . . beggars all description. An ocean of prairie surrounds the spectator whose vision is not limited to less than 30 or 40 miles. This great sea of verdure is interspersed with delightfully varying undulations like vast waves of the ocean. Here and there sinking in the hollows or cresting the swells appears spots of trees as if planted by hand for the purpose of ornamenting this naturally splendid scene." From an 1837 journal describing the beauty of a prairie.

An artistic interpretation:
Expansive, open, flowing movement, energy, and sweeping forms describe a vista view of a prairie. The line of the prairie is low, flat or horizontal. Drifts of colors and forms create free-flowing patterns that weave in and out of the prairie. The movement is wave-like.
The ubiquitous grasses provide unity throughout the prairie. The grasses are the common tying elements through the entire scene. Colorful forbs accent the prairie scene. They add vividness and memory to the scene. "Drifts" of forbs gradually emerge and concentrate then blend into the background again. Environmental factors, such as soil type, microclimate, and individual plant characteristics create these drifts.

Close-up View
A writer's account
"...Look closely among the grasses around your feet. Blossoms of orange and pink and white are scattered all through the tangle of grasses, blazes of color against the cool green. Stretching out your arms, you can almost touch a dozen different kinds of bright flowers. Some of them stand alone—a single flower or two, different from all those surrounding it. Others blossom among a whole crowd of their own kind in a cheerful cluster. It is not an orderly flower bed, but it is a rich one.” From Seasons of a Tallgrass Prairie by Carol Lerner.

An artist's interpretation:
Contrasts, texture, color, variety, and depth describe a close-up view of a prairie. The line is vertical and erect; a horizontal line is loosely introduced through the various heights of the plants. Distinct layers like in a forest are evident. The variety of species and individuals result in contrasts of colors, shapes, and textures. Texture plays an important visual role—fine-textured grasses contrast with broad-leaved plants. Differences of leaf shapes further diversify the textural contrasts. The emphasis of the close-up view is on the individual stems rather than a mass.

ACTIVITY DESCRIPTION:
Go out to the prairie and select a spot to view the entire prairie. Discuss the artistic characteristics of a vista view. Read a quote of how impressive the original prairie was when viewed as far as the eye can see. Imagine how it must have looked as you listen to the recounting.

Spread out and draw a vista view of the prairie. Draw for 20 minutes. Regroup and share your drawings and describe what you noticed. How did the vista approach make you feel?

Now select a spot to observe a close-up view of the prairie. Discuss the characteristics of a close-up view and read the quote about looking into a prairie. Draw a detailed view of your prairie for 10 minutes. Regroup and share your drawings and describe what you noticed. How did the close-up approach make you feel?

EXTENSIONS
✓ Repeat this exercise each season. Repetition allows students to observe change through time, expands awareness, and conveys a sense of discovery and connection with the natural world.
✓ Visit a prairie to use as a model for your school's restoration. Examine the close-up and vista views to determine what elements to include in your restoration.
✓ Write an article for the local newspaper about the artistic splendor of the prairie.

ASSESSMENT:
✓ Summarize the class discussion of the activity. Write the summary in a news article format.
✓ Participate meaningfully in a class discussion.
✓ Compare and contrast the two views. Describe three design lessons you observed that you could incorporate into your school site restoration.
Noting Notable Features


Activity time: 1 hour on the school grounds, 3/4 hour discussion in the classroom

Materials needed: clipboards, pencils (or colored pencils), Noting Notable Features handout, map of schoolyard showing property lines and building locations, and/or graph paper

Season: Any

Objectives: Students will:
- Practice observation and investigative skills
- Survey and collect information about their school site
- Describe interactions and details about their school site

Summary: Students survey their schoolyard as the first step to learning about the characteristics and layout of the school property.

Pre-activity preparations:
- Divide the schoolyard into sections. Study one section at a time during the activity.
- Make a copy of an existing map showing the location of buildings, drives, and property lines. Locate north, east, south, and west on the map. Create a transparency of the schoolyard map for focusing discussions after the activity. It is not necessary to use a map drawn to scale for the purpose of this activity. Make enough copies of the map for each student or student groups.

Activity description:
This activity will help you to get acquainted with your schoolyard. It is the first step in understanding the natural and cultural make-up of your schoolyard environment and in planning your restoration projects. You will walk the school grounds to identify and locate human-related features, biological, and physical characteristics unique to the school. Locate and use symbols on your schoolyard map to identify the features listed in the "Noting Notable Features" hand out.

In the classroom draw the physical, human-related, and biological features on the overhead transparency. Discuss the following questions:
- Identify patterns in water movement, foot traffic, and sun and shade.
- Predict the potentially coolest and warmest areas on the school grounds.
- Identify areas of high use and low use based on your observations.
- Begin to identify possible spaces for restorations. Identify areas that could not be restoration plots.
- Begin to consider what types of communities may be suitable for your school grounds.
- Considering the views, what areas would you enhance (direct attention to) or what areas might you hide?
- Identify the wildlife you found and where you observed it on your school yard. Do any patterns emerge where you sighted wildlife?
Noting Notable Features

Directions: Use a map of your school site to note the following physical, human-related, and biological characteristics present. Create a key and designate symbols to mark the various characteristics on your map.

Physical Characteristics:
- Topography: Find high spots in the schoolyard. Determine the highest spot. Find low spots. Determine the lowest spot. Locate steep slopes.
- Water: Designate any areas that are obvious drainage or waterways. Find any spots that seem to have wet soil now or at some time of the year. Find spots that seem especially dry.
- Prevailing wind: Determine wind direction. Winter winds are from the northwest. Summer winds are from the southwest.
- Sunny/Shady areas:
  Summer: 
  - shade: Designate areas that receive the most shade from trees and the school.
  - sun: Designate areas that receive the most sun.
  Winter:
  - shade: Designate areas that receive the most shade.
  - sun: Designate areas that receive the most sun.

Human-related Features:
- Playground structures: Define areas where students play on structures or in open areas.
- Other structures: Indicate locations of bike racks, signs, benches, picnic tables, and fences.
- Athletic fields: Identify the athletic fields.
- Foot traffic: Determine where people walk that is NOT a designated sidewalk.
- Utility features: Locate obvious utility lines above or below ground.
- Views:
  - Poor views: Look for views off the property that you would rather not see.
  - Good views: Look for views that are important or pleasant to see. Note what these views are.
  - Classroom views: Take note of the views from the windows.

Biological Characteristics:
- Trees and shrubs:
  - Identify where trees and shrubs are located.
  - Look for trees, shrubs, and plants that provide food (berries, nuts, or seeds) and cover for wildlife.
- Wildlife: Look for wildlife on the school grounds. Indicate what you see and where.
- Groundcover: Locate different groundcovers such as lawn grass, flowerbeds, unmowed areas (or old fields), woodland groundcovers, agricultural areas, etc.

Note Other Important Observations:


Earth Partnership Program, UW-Madison Arboretum
Exploring Your Site through Color, Texture, and Pattern


ACTIVITY TIME: 45 minutes on the school grounds, variable in the classroom

MATERIALS NEEDED: Box of crayons or color chips from a paint store, watercolors, sample construction paper swatchbooks; and field sheets and pencils

OBJECTIVES: Students will:
- identify and analyze color on the school grounds (k-12)
- discriminate colors that are dark-light, bright-dull (6-12)
- identify and analyze patterns in the school environment, such as repetition of shapes, lines, colors
- identify and analyze patterns in plants, flowers, trees
- identify textures including rough-smooth, hard-soft, shiny-dull in a natural environment
- record their observations on a field sheet for further discussion

SUMMARY: Students discover, identify and analyze colors, patterns, and textures on the school grounds.

SPECIFIC BACKGROUND:

Color:
Sunlight is composed of a spectrum of wavelengths from invisible, such as ultraviolet light, and visible light. The visible light range is composed of color light waves—red, orange, yellow, green, blue, and violet. The color that we see in an object is the reflected wavelength; all other wavelengths are absorbed. When we perceive a flower as blue, it means the flower is reflecting blue light waves and absorbing all other colors.

Vocabulary students may use to identify and characterize color follows:

- Hue: the classification or name of a color (e.g., turquoise blue, olive green)
- Intensity: the brightness or dullness of color (e.g., vivid violet, bright, dim, dingy)
- Value: the amount of light (white) or dark (black) contained in color (e.g., light yellow, pale orange, dark red, deep purple)

Pattern:
Pattern is repetition of shapes, forms, lines and colors in a specific rhythm. Patterns may be a decorative planned design such as a paisley pattern, or a natural and unplanned pattern like a snowflake. Patterns may be regular, based on a repetition of units, such as bricks in a wall, or irregular, such as branches of a vine growing on the wall.
Examples of patterns in nature include ripples in water, petals of flowers, and clusters of leaves.

Texture:
Texture is the surface quality of an object. Texture is touched (tactile), such as feeling the rough bark on a tree, or seen (visual), such as observing an uneven surface of a pitted rock. Surfaces may be rough, smooth, shiny, dull, hard, or soft.
ACTIVITY DESCRIPTION:
Having an understanding of the diversity of colors, textures and patterns in a natural area of schoolyard can help inform the design and implementation of your restoration project. Go out to the schoolyard and look for as many colors, textures and patterns as you can find using the following directions.

Discover Color
Identify natural colors on the school grounds. Use a box of crayons, (or paint chips, water colors, sample paper swatchbooks) to match the colors of leaves, flowers, tree bark, rocks, mosses, lichen, soil, and so on. (Older students--describe the hue, intensity, and value of colors you see.) Mark on your field sheet the different colors that you find.

Observe Pattern
Look for patterns on the school grounds. Search for large and small patterns, regular and random patterns; and patterns of light and dark, shapes, colors, and lines. Draw the patterns on your field sheet.

Detect Texture
Identify textures on the school grounds. Look for rough and smooth, hard and soft, shiny, and dull textures. Make rubbings or represent texture by drawing various kinds of lines, dots, and dashes.

When you return to the classroom classify the colors, textures and patterns into groups. Which colors are represented the most, the least? Are there more warm (red, orange, yellow) colors or cool (blue hues) colors? How many different textures and patterns did you observe? Is there a relationship between pattern and texture? Graph the results of these comparisons. Discuss and analyze why specific colors or patterns are dominant or not.

EXTENSIONS:
✓ Return to the schoolyard to look for colors, patterns and textures of human-made features. Compare these results with the natural elements of the schoolyard.
✓ Create artwork using the colors, patterns and textures you find on the schoolyard.
✓ Repeat the activity in different ecosystems—prairie, woodland, wetland, or a city block.
✓ Discuss how this activity and related observations can inform the restoration design.

ASSESSMENT:
✓ Describe the relationship between light and color. Why does a blade of grass look green?
✓ Describe different types of patterns you will find on your school grounds.
✓ Write a description of an object using color, pattern and texture without naming the object.
Exploring Your Schoolgrounds Through Color, Texture, and Pattern

Directions: Look in and around your schoolgrounds and identify colors, textures and patterns that portray the essence of your school. You may sketch visual illustrations, create rubbings or draw impression’s of what you see, hear, smell and touch.
Prairie Geometry

SOURCE: Georgia Gomez-Ibanez, Cambridge Elementary School

SUBJECT:  
- [ ] SCIENCE  
- [x] MATH  
- [ ] LANGUAGE ARTS  
- [ ] SOCIAL STUDIES  
- [ ] ART  
- [ ] MUSIC  
- [ ] OTHER

GRADE:  
- [ ] K-2  
- [x] 3-5  
- [ ] 6-8  
- [ ] 9-12


SUMMARY: Students find prairie plants that represent geometric shapes.

ACTIVITY TIME: 30 minutes to find plants, 30 minutes to add pictures to the classroom shape book

MATERIALS NEEDED: Set of cards with labeled pictures of the common geometric shapes (circle, square, triangle, rectangle, oval, pentagon, hexagon, octagon), a classroom shape book containing shapes found in other built and natural areas (optional)

SEASON: Late spring, summer, early fall

ACTIVITY DESCRIPTION: Natural areas on or near school grounds can provide students with a variety of opportunities to apply concepts learned in the classroom to the natural world. One example is having students apply their conceptual understanding of geometrical shapes such as circles, triangles, and squares in natural settings can reinforce their understanding through a meaningful outdoors experience.

STEPS:
1. Review the geometrical shapes students will be recording in the field. Explain to students that they will be visiting a natural area and looking for geometrical shapes in the prairie (or other ecosystem).
2. Give each child a card with a geometric shape and ask them to look around the natural area until they find a plant or plant part shaped like their shape.
2. Students can tie a red string around the plant and at the end, the class can gather to admire everyone's discovery.
3. Children might draw their prairie shape on another card. These drawings can be added to a classroom shape book.
4. Have a class discussion about students' observations and findings in the field. What was most interesting or surprising? What shapes did you find and where?

EXTENSIONS:
✓ Students can investigate the plant(s) shapes they found in more detail using reference books. Could the geometrical shapes they discovered be of special importance to the survival of a plant? Why or why not? What additional information or research is needed to learn more?
✓ Each student can create their own shape book and make observations throughout the year.
✓ Invite a local artist to speak about the use of form and function in natural artwork.

ASSESSMENT:
✓ Students can define at least 4 geometrical shapes.
✓ Student shape books can be a portfolio assessment reflecting their understanding of geometrical shapes.
Ecosystem Observation Cards

SUBJECT:  
___x__ SCIENCE  
____ MATH  
___x__ LANGUAGE ARTS  
____ SOCIAL STUDIES  
___x__ ART  
____ MUSIC  
____ OTHER

GRADE:  
____x__ K-2  
____x__ 3-5  
____ 6-8  
____ 9-12

ACTIVITY TIME: 15-30 minutes at a natural site

MATERIALS NEEDED: Observation cards, writing utensils, clip boards, measuring sticks

SEASON: any

OBJECTIVES: Students will:
- experience a natural setting through first-hand contact
- practice observation skills at different times of year
- develop a list of words to communicate impressions and observations
- draw observed subjects

SUMMARY: Students go out to a remnant or restoration with a set of Observations Cards to familiarize themselves with an ecosystem at different times of year.

SPECIFIC BACKGROUND
An important first step in studying or restoring an area is to get to know the model ecosystem. Students, as well as adults, may have had little first-hand experience with the ecosystem in question. While background material is important, students must have an opportunity to experience the natural model that they are going to recreate.

Our first encounter with an ecosystem should include observing, exploring and interacting with the natural area. Identification generally comes later. We can observe small and large changes in a single natural area during different times of the year. Too often we can get bogged down in identification and fail to open our eyes to other things going on.

Simply going out and sitting in an area is not likely to hold attention or prove useful to a significant degree. Giving students direction and focus will help them make observations and personalize the experience. There are many ways to provide this direction. Following this page are masters of Observation Cards. These cards are only a beginning; cards that challenge students to consider other things such as color, texture, patterns, seasonal changes, plant-plant or plant-animal interactions and wind movement might also be effective. In addition, these cards can and should be modified, expanded and customized to fit needs and interests of students, ecosystem, season, available time, and so on.

ACTIVITY DESCRIPTION
Identify a restored or remnant example of the ecosystem to study. Prior to beginning the activity, define the boundaries within the chosen ecosystem where students will make their observations. Make sure students understand that staying within the boundaries protects them and wildlife that may be in the area. You may choose to have students work in pairs or individually to complete the Observation Cards outdoors. After returning to the classroom, have students share their Observation Cards with the class and then compile the results as a group. Discuss what surprises, if any, they found in the observation area. What plants and animals did they see or hear? How might this area differ from another area like the woods, schoolyard, prairie or

Earth Partnership for Schools Program, University of Wisconsin-Madison Arboretum
Waxy leaf surface (waxed paper) Waxy coated leaves retain water and retard evaporation. Similar to how chapstick is used to prevent lips from drying out.
Hairs on leaf surfaces (piece of fur) Hair reflects sunlight, keeps leaves cooler, creates a local high humidity “boundary layer” on leaf surface.
Finely divided leaves (paper doily) Finely divided leaves allow wind to pass, retarding evaporation from the leaf surface.
Narrow, curled leaf (green ribbon) Narrow vertical leaf can curl up retarding evaporation from the leaf surface.

Prairie plants have developed adaptations in response to conditions other than drought, such as competition for space, light, and pollinators, as well as conditions of high wind, grazing and fire. However, the drought-related adaptations are distinctive, varied and relatively easy for students to observe and often parallel adaptations for grazing or fire conditions.

Several prairie plants have rough leaves that are thought to deter predators. A piece of sandpaper in the scavenger hunt bag can represent the rough leaf of a Silphium, sunflower or coneflower. The rough leaf is a good example of how a plant’s feature could be an adaptation or could be an artifact of another aspect of the plants development and physiology. For instance, large stomata on the leaf surface might cause roughness that is unrelated to predator deterrence.

Note: If you have poison parsnip in the site for this activity, be sure students recognize it before starting.

ACTIVITY DESCRIPTION:
Divide into groups of 3-4, each group receives a bag. How many different plants you can find that have leaf adaptations represented by the objects in your bag? Trace a leaf, sketch the plant or tie a piece of yarn around it to show others. Be careful not to harm the plant. Regroup and compare findings.

EXTENSIONS:
✓ Find example of adaptations to other factors such as competition for space, light or pollinators.
✓ Create a “perfectly adapted” prairie plant. Build a model of the plant and present it to others. After discussion and examining other students’ work, revise your own plant.
✓ For each adaptive trait observed, hypothesize a different condition that could have caused the same trait.
✓ Describe animal adaptations that could have arisen in response to the dry prairie conditions.

ASSESSMENT:
✓ Describe 3 examples of how plant structures are modified due to low water availability and high temperatures.
✓ How do prairie plants survive drought, high temperatures, and intense sunlight?
✓ Given the specific adaptations prairie plants have developed in response to low water availability, what kinds of adaptations would you predict plants might develop in response to excess water availability?
What's Happening?

Listen
Write 3 words that describe what you hear

Look
Write 3 words that describe what you see

Feel
Write 2 words that describe what you feel

Smell
Write 1 word that describes what you smell

What's the Weather?
circle one

Temperature
in
COLD between HOT

Wind
in
WINDY between STILL

Water
in
WET between DRY

Light
in
SUNNY between CLOUDY
Leaf Size Measurements

Plant # 1

Name: ____________________________
Leaf Length (from leaf base to leaf tip):
Leaf Width (at widest point):
Surface Area (width \times length):

Draw your leaf here.

Plant # 2

Name: ____________________________
Leaf Length (from leaf base to leaf tip):
Leaf Width (at widest point):
Surface Area (width \times length):

Draw your leaf here.

Can you find things that are...

□ Soft
□ Fuzzy

□ Hard
□ Waxy

□ Smooth
□ Scratchy
Draw an example of each stage in a plant's life cycle.

What animals, birds or insects do you see or hear?

I see a ____________________________________________.

I see it ____________________________________________.

(What is it doing?)

I see it ____________________________________________.

(Where is it?)

I hear a ____________________________________________.

I hear it ____________________________________________.

(Where is it?)
Take A Look

<table>
<thead>
<tr>
<th>Flowers</th>
<th>Plants that reach the top of your shoes</th>
<th>Plants that reach your knees</th>
<th>Leaves bigger than your hand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bird Calls</td>
<td>Insects</td>
<td>Butterflies</td>
<td>Spiders</td>
</tr>
</tbody>
</table>

Tally how many you find

Earth Partnership Program, UW-Madison Arboretum

Show Me

Draw the smallest thing you see

Draw your favorite thing

Draw the biggest thing you see

Earth Partnership Program, UW-Madison Arboretum
Winter Observations

Name: ___________________________ Date: ___________________________

Earth Partnership Program, UW-Madison Arboretum

Take A Look in Winter

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Plants below your knees</th>
<th>Plants above your knees</th>
<th>Green Plants (hint: look under the snow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bird Calls</td>
<td>Different Animal Tracks</td>
<td>Bird, Insect, Animal Shelter</td>
<td>Different Colors</td>
</tr>
</tbody>
</table>

Tally how many you find

Earth Partnership Program, UW-Madison Arboretum
Winter Food Sources

Circle the food type you find.

Fruit
Bark
Other: __________

Seeds
Leaf Buds

Nuts
Leaves

Circle how much is available.

in
a little
between
a lot

What, if any, evidence do you see of animals eating this food?

________________________

________________________

Earth Partnership Program, UW-Madison Arboretum

What if I Was a __________

How would I survive in the winter?

I would eat ____________________

and __________________________.

I would live ____________________

Choose an animal that is active in the winter and find a place for it to live and 2 foods it could eat. Draw what you find.

Earth Partnership Program, UW-Madison Arboretum
How Do You Measure Up?  
Plant Height in the Prairie

Introduction

Research Question
How tall are the plants in the prairie? Which ones are the tallest? Are the grasses and forbs the same height?

Equipment
Measuring sticks  
Clipboard with pencil and data sheet

Instructions
Go to a spot on the prairie where you can walk off the trail. When you get there, look at the plants. There are two types of plants on the prairie, the grasses and the forbs. Forbs are herbaceous plants that are not a grass, sedge or woody.

Use the measuring stick to measure (in centimeters) the tallest 5 grasses you can find. Measure from the ground to the tip or the tallest point on each plant. Record these measurements on your data sheet. Next, measure the tallest 5 forbs you can find and record these on your data sheet.
How Do You Measure Up?
Plant Height in the Prairie

Data Sheet

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Researcher names</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>School Name</th>
</tr>
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<tbody>
<tr>
<td>--------------</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Grass Heights (in centimeters)</th>
<th>Forb Heights (in centimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ___________________________</td>
<td>1. ___________________________</td>
</tr>
<tr>
<td>2. ___________________________</td>
<td>2. ___________________________</td>
</tr>
<tr>
<td>3. ___________________________</td>
<td>3. ___________________________</td>
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<tr>
<td>4. ___________________________</td>
<td>4. ___________________________</td>
</tr>
<tr>
<td>5. ___________________________</td>
<td>5. ___________________________</td>
</tr>
</tbody>
</table>

Your questions about plant height:

---

Earth Partnership for Schools Program, University of Wisconsin-Madison Arboretum
How Do You Measure Up?
Plant Height in the Prairie

Student Worksheet

1. Graphing
What can you tell from your graphs?

2. Calculating the average

Grass Heights (in centimeters)  

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
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<td>___</td>
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Forb Heights (in centimeters)  

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<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
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</tr>
</tbody>
</table>

TOTAL SUM
Grass Height Average = Total Sum + 5 =
Forb Height Average = Total Sum + 5 =

3. How long are the roots?

2/3 of a prairie plant is below ground and 1/3 is above ground. Calculate the length of the root of your average grass and average forb.

Grass height average x 2 = (grass root length)

Forb height average x 2 = (forb root length)
How Do You Measure Up? Plant Height in the Prairie

Height (cm)

Plant Height-Forbs

Plant #1  Plant #2  Plant #3  Plant #4  Plant #5

Plants
How Do You Measure Up? Plant Height in the Prairie

Plant Height - Grasses

Height (cm)

<table>
<thead>
<tr>
<th>Plant #1</th>
<th>Plant #2</th>
<th>Plant #3</th>
<th>Plant #4</th>
<th>Plant #5</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm</td>
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</tbody>
</table>
Sweeping Discoveries

SUBJECT: ___X__ SCIENCE  GRADE: ___ K-2
___ MATH  ___ X__ 3-5
___ LANGUAGE ARTS  ___ X__ 6-8
___ SOCIAL STUDIES  ___ X__ 9-12
___ ART
___ MUSIC
___ OTHER


ACTIVITY TIME: 1-2 hours, depending on time spent observing, distinguishing, and identifying insects.

MATERIALS NEEDED: sweep nets, white sheet or large white paper, bug box and/or magnifying glass

SEASON: Spring, summer, or fall

OBJECTIVES: Students will:
- Practice observation skills
- Perceive the relationship between insects and their environment
- Consider the impact of humans on the environment

SUMMARY: Students will conduct insect surveys in the interior, edge and outside of a prairie restoration, and compare their results.

Background:
Scientists are learning something about the plants that were once native to the North American prairies, however, very little is known about the insect life associated with the native prairies and grasslands. Historical records often give us information about native plants; little is written in the historical records of the insect life. We know that insects play an extremely important role in any ecosystem as pollinators, decomposers and food sources. In a natural area, the habitat at the edge of the area's boundary is very different ecologically from its interior. The edge of a prairie can differ from the interior with respect to:
- temperature
- relative humidity
- penetration of light
- exposure to wind
- availability of pollinators
- availability of seed dispersers
- success of seed dispersal
- competition from exotic species
- suitable animal habitat
- soil organism populations

If the majority of our remaining natural prairie is in small remnants, there will be more “edge” habitat and less “interior” habitat and the proportions of various species will be modified. Today we are going to compare insect populations at the edge of a prairie with populations in the interior and exterior of the prairie.

Earth Partnership for Schools Program, University of Wisconsin-Madison Arboretum
Activity Description

Today we are going to compare insect populations at the edge of a prairie with populations in the interior and exterior of the prairie.

1. Starting at the restoration’s edge, pace off about 20 feet (7 meters) into and out of the prairie. These are the three sampling areas - interior, edge, exterior.

2. Sample an area by sweeping the net, in a single direction six times. Empty the contents on a white sheet and examine. Record your findings on the data sheet. This is one “sweep”.

3. Repeat process three more times and record.

4. Compile class findings and discuss.

EXTENSIONS:
✓ Keep tallies of the number of individuals of each type of insect; students can create names to distinguish species or use books to identify species to order (e.g. grasshopper, beetle), then create names to distinguish species within an order (e.g. green fly with long legs). Graph the results. In most ecosystems, there are a few abundant species and many uncommon ones. Discuss the concept of endangered species. See http://www.dnr.state.wi.us/org/1and/er/factsheets/etlist3.htm#INSECTS for a list of threatened and endangered insects in Wisconsin.

✓ Repeat these same methods at a remnant prairie. Compare the insect communities in the restoration and the remnant. Were any of the insects species present in one environment, but not the other? Did you find any species in both environments? Speculate on these findings. Design a research project to address your hypotheses.

✓ Repeat the same methods in a woodland. Compare the insect communities.

✓ Have student groups observe blooming plants. Are the same species of insects found on different plant species?

ADDITIONAL RESOURCES
✓ Borror, Donald and Richard White. Field guide to the insects of America north of Mexico

ASSESSMENTS:
✓ Have students make oral presentations of their findings.
✓ Have students hypothesize about the reasons underlying the results they found.
**CREEPING DISCOVERIES**

We discovered:

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of ants</th>
<th>Different kinds of ants</th>
<th>How long until ants arrived?</th>
<th>Other things found or heard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td>3</td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Team: ___________________________
We discovered:

<table>
<thead>
<tr>
<th>Sweep</th>
<th>Number of insects</th>
<th>Different kinds of insects</th>
<th>Color of flowers near insects</th>
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Sweeping Discoveries

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Sweeping Discoveries
Soil Texture Feel Test

SUBJECT: ___X___ SCIENCE
_____ MATH
_____ LANGUAGE ARTS
_____ SOCIAL STUDIES
_____ ART
_____ MUSIC
_____ OTHER

GRADE: ___X___ K-2
_____ 3-5
_____ 6-8
_____ 9-12


ACTIVITY TIME: 1 hour

MATERIALS NEEDED: Soil samples, spray bottles of water, paper toweling, Key to Soil Texture by Feel.

SEASON: Any season

OBJECTIVES: Students will:
manipulate and feel soil to classify soils by texture using a key
understand the relationship between soil particle size and plant growth and water

SUMMARY: Students collect soil samples and classify soil texture using a soil texture feel test key.

SPECIFIC BACKGROUND: Soil is made up of three particle sizes—sand, silt, and clay. Sand is the largest particle (0.05 to 2 mm diameter); silt is intermediate (0.05 to 0.002 mm); and clay is the smallest (less than 0.002 mm). Soils have different textures depending upon the proportions of sand, silt, or clay particles in the soil. A soil texture is graded into 14 texture classes such as sand, sandy loam, silty clay loam, loam, sandy clay, or clay. Sandy soil is any mix with over 90% sand; sandy loam is 70% sand, 15% silt, and 15% clay; clay soil is 50% clay, 25% silt, and 25% sand; heavy clay is any mix with over 60% clay.

The texture of the soil influences moisture holding capacity of soil, the drainage rate, and the soil’s ability to hold nutrients. Coarse, sandy soils drain water quickly and are poor storehouses of nutrients. Plants must be able to tolerate droughty conditions in most sandy soils. In clay soils water drains slowly, as a result, soil remains wet for long periods and often root development is hindered. Plants growing in clay must be able to tolerate long periods of excessive moisture with low oxygen conditions, or endure dry, hard soil. The medium texture of silt-sized particles creates a loamy soil that is well drained and holds nutrients. It is ideal for most plant growth. Consequently, different soils support different plant species or communities. Determining the soil texture of your restoration plot is one of the informational tools for assessing which community type the soil will sustain.

Soils can be classified into texture classes by the way they feel and respond to handling. Sand feels gritty and the grains do not stick together when squeezed. Silt feels velvety or flour-like when dry and forms a weak ribbon when wet. Pulverized dry clay feels smooth; aggregates and clods are very hard and difficult to crush by hand. Wet clay feels sticky or very smooth and satin-like when rubbed and forms a long, flexible ribbon.

Earth Partnership for Schools Program, UW-Madison Arboretum
ACTIVITY DESCRIPTION:

Collect soil samples from different areas around the school grounds. Collect 1 ½ cups of soil per sample for your classroom. The following soil texture feel test using a key will help you classify your soil. Step-by-step directions are written on the key.

EXTENSIONS:
✓ Soil textures vary from one horizon (soil layer) to the next; therefore, try to determine the texture in each of the A, B, and C horizons. Learning the soil texture of each horizon will help you assess the soil's permeability at different levels. In some soils, the water drains quickly in the topsoil but drains poorly in subsoil. In this example, plant/community selection would be modified due to the change in soil texture. See Earth Partnership activity "Soil Profile Examinations" for more information about soil horizons.
✓ Determine soil type using a soil chart and measuring percentages of sand, silt, and clay. See following article from Fine Gardening magazine. Compare results of the two different methods.
✓ Classify and compare soil textures from different plant communities such as restored prairies, remnant prairies, woodlands, old fields, and lawns.
✓ Classify and compare soil texture at different locations on a slope or in eroded areas. Which particles collect at the base of the slope or remain on top? Which particles erode first? Is the pattern similar to particle movement on a slope? Can you predict which soils are more susceptible to erosion?

Assessment:
✓ Explain how soil is classified and 2 to 3 properties of each soil textural type.
✓ Explain the relationship between soil particle size and plant growth and water.
✓ Determine the soil texture of three soil samples.
Factors of Soil Formation

- **Parent Material**  
  Chemical and physical aspects

- **Climate**  
  Precipitation and temperature

- **Organisms**  
  Fauna and flora

- **Relief**  
  Elevation, slope, depth to water table

- **Time**

---

**A Soil Metaphor: “The Soil Recipe”**

**Activity:** Demonstrate the process of soil formation through baking a cake.

**Materials needed:** Mixing bowl, cake pan filled with soil, large spoon, rocks, thermometer, spray bottle of water, leaves, gummy worms, a picture of a topographic feature, and a watch.

**Directions:**

1. **Add the first ingredient in the mixing bowl.**  
   Rocks = the parent material. Rocks are the main ingredients.

2. **Stir (stir after each ingredient is added)**

3. **Next add the climatic factors -- the climate begins the process of eroding the rock.**  
   - Thermometer = temperature -- heating / cooling causes cracking.
   - Water = Rain -- washes particles off the rock, seeps into cracks, freezes and thaws further splitting the rock.
   - Have everyone blow into the mixing bowl = wind -- beats at the rock breaking off particles.

4. **Then add the living organisms, the flora (plants) and fauna (animals).**
   - Leaves = flora -- adds organic matter.
   - Gummy worms = fauna -- mixes and churns the developing soil.

5. **Finally, add topography and time to the bowl.**
   - topographic picture = topography -- mountains, hills, valleys, plains.
   - Location of the lock determines how the climate affects soil formation.
   - Watch = time -- it all takes time -- hundreds and thousands of years. Wisconsin’s soils are relatively young because glaciers rearranged the landscape 10,000 years ago.

6. **Bake for a very long time.**

7. **Finale:** Present the finished product in the cake pan.
Key to Soil Texture by Feel

Begin at the place marked "start" and follow the flow chart by answering the questions, until you identify the soil sample. Please note that soils having a high organic matter content may feel smoother (siltier) than they actually are.

Place approximately 2 teaspoons of soil in your palm. Add water by drops and knead soil until it is moldable and feels like moist putty.

Does soil remain in a ball when squeezed?
YES  NO

Place ball of soil between thumb and forefinger. Gently push the soil with thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow the ribbon to emerge and extend over forefinger, until it breaks from its own weight. Does soil form a ribbon??

NO  YES

Does soil make a weak ribbon <1" long before it breaks?
YES

Does soil feel very gritty?
YES  NO

SANDY LOAM

LOAM or SILT LOAM

SANDY LOAM

CLAY LAOM or SILTY CLAY LOAM

SANDY CLAY

CLAY

Source: Adapted from WOW! : The Wonders of Wetlands, Environmental Concern Inc. Earth Partnership for Schools Program, UW- Madison Arboretum, (608) 262-9925
What goes on under your feet?

Soil Meditations

Are you walking on air? Think about the earth under your feet. It seems solid. You can jump on it and nothing appears to collapse under you. But if the earth is so solid, where do trees and other plants put their roots? How do earthworms breathe? And why does rainwater soak into the ground?

Soil comes from solid rock that has broken down into very tiny particles, and also from decomposed plant and animal tissues. These bits of rock and organic matter are many different shapes and sizes, so they don't fit solidly together, but contain many tiny spaces.

The open spaces between soil particles are filled with air, water and life. One ounce of soil can contain as much as 250,000 square feet of surface area, or about 6 football fields. Millions of bacteria, fungi, algae, protozoa and nematodes can exist in just a handful of soil (for more on microorganisms see p. 17). Other larger soil residents include earthworms, roots, springtails, seeds, moles, badgers and insect larvae.

The world under your feet is wonderfully diverse and complex. Soils vary greatly, not just between regions, but even from one part of a garden to another. You can see, feel and even smell many different soil characteristics, which in turn tell you something about a soil's chemical and mineral makeup. Factors that influence soils include the types of rock they come from, their age, rainfall and other climatic factors, topography and human activity.

You can use the Sedimentation Bottle, the Soil Column and other explorations in this chapter to look at many different soil characteristics, including texture and how soil holds water. You can even “cook with soils,” and grow plants to test your results.

Connections:

microbiology, geology, agriculture, soil ecology, plant nutrition, physics, math, geometry. Scientific process skills — observing, data recording, quantification, inferring, comparing.
1. Remove the label from a 1-liter bottle (see p. 3).

2. If your bottle has a base, trim away sides of base to expose entire bottle.

3. Using a graduated cylinder, or some other known measured container, add water to the bottle in 100 ml increments, marking your bottle every 100 milliliters (or cubic centimeters) from the bottom to the 1000 ml point.

Use a waterproof pen. You'll notice the spacing between marks changes as the bottle changes shape.

MATERIALS:
- one 1-liter bottle plus cap
- Bottle Biology Tool Kit (p. 2)
- graduated cylinder or other measured container
- 200 cubic centimeters (ccs) soil
- water
Particle fallout: How many different layers can you identify? After everything has settled, re-shake the bottle and time the settlement rates of the various particles. Can you graph your results?

Some soils may have many fine clay particles that remain suspended in the water for hours or even days. You may also observe a layer of decomposing plant material or organic matter floating on the surface of the water. You will see some of these particles fall slowly as they soak up enough water to sink.

Gas bubbles: Let the bottle sit for a day or two and then tap the sides. Does anything happen? Photosynthesis and respiration by algae and soil bacteria may have produced many tiny gas bubbles, which will rise to the surface when you tap the bottle. You may also see crumbs of soil rising to the surface, buoyed up by gas bubbles produced by soil microbes. What happens if you make two identical soil columns and keep one in a dark place?

Darkle, darkle little grain
I wonder how you entertain
A thousand creatures
microscopic.
Grains like you from Pole to Tropic
Sustain land life on this planet!
I marvel at you, crumb of granite.

— Francis Hole, 1992
Soil Scientist,
Professor Emeritus
University of Wisconsin,
Madison
Soil Column: How much water can your soil hold? **Water holding capacity** is the ability of soil to hold on to moisture against the force of gravity. The ability of a soil to retain water depends in part on the soil's texture (see p. 43).

A soil's water holding capacity is important to farmers and gardeners because it indicates how much water is available to plants.

**Just add water:** Fill the Soil Column with 500 ccs of a sample soil. Add water, 20 mls at a time, until the soil is thoroughly wetted, or when water just begins to drip out of the bottom of the column.

Your soil may contain lots of organic matter, which resists absorbing water. This may cause water to channel through the soil and leave dry areas.

If this happens, thoroughly wet all the soil by stirring the column contents until the soil has been thoroughly moistened. Dump any water that has dripped into the bottom chamber of the column back into the top.

Follow the chart on the next page for directions on determining water holding capacity.
### Soil Observation Chart

**Determine water holding capacity:** Thoroughly wet 500 ccs of soil in your Soil Column, keeping careful track of how many mls of water you add. Call this amount $W_1$. Cover the column to minimize evaporation and let it sit for 24 hours. After 24 hours, measure any water that has drained into the bottom of the column and call it $W_2$. Subtract $W_2$ from $W_1$. The result is the total amount of water now held by the soil in your column, and is an estimation of your soil sample's water holding capacity.

| Water added to wet 500 ccs of soil ($W_1$): | ____________ mls |
| Water drained from column after 24 hours ($W_2$): | ____________ mls |
| Total amount of water held by 500 ccs of soil, or water holding capacity, $(W_1 - W_2)$: | ____________ mls |

**Measure soil pH:** Test the pH of the water before you pour it through your column and compare that to the pH of the water that drips through your column. For more on pH and how to measure it, see p. 26.

Soils in wetter regions tend to be more acidic, and those in dry regions more alkaline, or basic. This is because water moving through soil tends to carry basic minerals deeper into the soil. The soil surface is then left more acidic. Some soils such as those derived from limestone, however, have a **buffering capacity**. That is, their mineral makeup has a neutralizing effect. This is why lakes in limestone areas are less susceptible to the detrimental effects of acid rain.

| pH of water before addition to column: | ____________ |
| pH of water after running through column: | ____________ |

**Describe soil changes:** Has the soil swelled or settled in your column in response to the water you added? Changes may occur for several days after the initial watering due to certain types of clay and organic materials that swell in the presence of water.

Has the **color** changed in response to moisture? How about **odor**? Let your column sit for a week or two to see if anything grows. Very often any soil you collect will contain plant seeds, moss or fern spores, or even worm cocoons and insect eggs.

**Soil height** (from bottom of column to soil surface)
before soil saturation: ________ cm

**Soil height** after ___ hrs or ___ days: _____ cm
Film Can Mysteries: How dense is dirt?

Density: In this exploration, you will fill film cans with several different soil components and soil types, and compare their densities. A soil's density is determined by the type of material it is derived from and how loosely or tightly soil particles are packed.

Collect soil samples and/or soil components such as gravel, sand, silt, vermiculite, clay and organic matter such as peat moss, compost, or manure. Air dry any samples you collect since moisture content can affect density. You will also need five to eleven black film cans.

Completely fill each film can with a sample soil or soil component and snap on the lids. Leave two cans empty. Fill one of the last two cans with water and leave the other empty. Randomly number all the cans, but keep a list indicating which numbered film can corresponds to which type of soil, soil components, water, or air. You will also need a Bottle Balance (p. 115), or another balance to weigh your film cans.

Teacher's note: If you make five or six identical sets of the mystery film cans, you can divide your class into five or six cooperative groups. Group members can take turns weighing, balancing, recording answers and writing their results on the board.

How heavy are they?: Pick up the mystery film cans. Weigh them in your hands. How heavy are they? Shake them next to your ear. What do you hear?

Next, weigh the film cans in your hands and rank them from lightest to heaviest. Use the numbers on the lids to identify them, and write a series on the blackboard like this:

\[ 2 < 1 < 3 < 6 < 5 < 4 \]

Now you have an idea of how the film cans compare to each other in weight. But how would you figure out the exact density of each film can?

We will estimate the densities of different types of soil by comparing their weights.
Observations from a Single Spot

SUBJECT:  X  SCIENCE  GRADE:  X  K-2
_____ MATH
_____ LANGUAGE ARTS
_____ SOCIAL STUDIES
_____ ART (in extension)
_____ MUSIC
_____ OTHER


ACTIVITY TIME: 30 minutes in the prairie, 15 minutes debriefing observations

MATERIALS NEEDED: journal, pen or pencil, clipboards

SEASON: Any

OBJECTIVES: Students will:
  practice observation skills
  create expressive writing in response to direct observation
  perceive seasonal and/or phenological changes in a natural setting

SUMMARY: Students observe a single spot and record impressions of it. Later, they return to note the changes in the spot.

SPECIFIC BACKGROUND: Developing observational skills is both an art and a science. Artist and naturalist writer, Clare Walker Leslie, once stated that "the goal of journaling should be to capture one exceptional moment each day." Making observations from a single spot helps you to recognize those exceptional moments as you take the time, space, and effort to enjoy a special place, observing both the large and small details of the area. You can use your senses to perhaps smell the richness of the soil, feel the roughness of a leaf, or maybe glimpse a hawk soaring overhead. By revisiting a single spot over time, you can also witness seasonal changes that occur each year at about the same time. Focusing on the natural world can also be a springboard for personal reflection.

ACTIVITY DESCRIPTION:
Go out to a natural area and select a spot. You will need to identify this spot so you can return to it at a later date.

Settle into your place for at least 10 minutes without writing. After 10 minutes, the teacher will indicate the time and you can begin writing at any time after that.

Get to know your spot. Think, observe, and experience it. Write down the things you sense or your thoughts as you sit. Write in any way that you want. You can list of observations, write an essay, compose some poetic lines or just jot down thoughts as they come to you.
Following are some things you may wish to consider:

- **What do you see?** Look close up, far away and in between. Examine the soil grain, leaf margin, and decomposing fibers; the waving landscape and distant horizon; and things in between the two.
- **What do you hear?** Listen sounds close up and far away, loud and soft. Put your ear to the ground and listen to the minute rustlings and hold your head high and listen to the wind.
- **What do you feel?** Feel the small, big, soft and hard things around you; feel the cool leaf, wet detritus, sharp grass blade, the hot wind and hard ground.
- **What do you smell?** Tune into different smells. Try to smell the soil, the ant, and the water drop as well as the breeze, the plant community and the earth.
- **What feelings do you have as you sit in your spot?**
- **What processes are happening on your spot?**
- **Who or what has been at your spot?**
- **How is your spot a part of the larger area surrounding it?**
- **What words describe your spot?**

Return and share your observations and insights with others in the class. How were your observations similar and different? If you visited your single spot many times, do you think you would see the same things if you made observations at another time? What would be the same and what might be different?

**EXTENSIONS:**
- ✓ Create a personal journal for recording your observations over time.
- ✓ Draw a picture of the spot. The drawing can capture a close up or vista view (see Earth Partnership for Schools Activity, "A Prairie through an Artist’s Eye").
- ✓ Create a poem about the spot. The poem could be in haiku, cinquain, diamonte or other appropriate form. (see Earth Partnership for Schools Activity, "Prairie Poetry").
- ✓ Visit your spot monthly and create a record of the changes.
- ✓ Make a calendar that describes the changes you witness along with the observations of classmates.

**ADDITIONAL RESOURCES:**
- **Sample Nature Writing:**

**ASSESSMENT:**
- ✓ Create a short story based on your single spot observations.
- ✓ Keep a nature journal or portfolio of observations over time.
- ✓ Have students make oral presentations of their observations and related prose to their peers.
- ✓ Develop 2-3 scientific explanations for possible connections among living and non-living things observed in a single spot over time.
- ✓ Have students name 2-3 living plants, animals, or insects observed in their “single spot” and how those organisms may have adapted to their environment.
Prairie Poetry

SUBJECT: ___ SCIENCE ___ MATH ___ LANGUAGE ARTS ___ SOCIAL STUDIES ___ ART ___ MUSIC ___ OTHER

GRADE: ___ K-2 ___ 3-5 ___ 6-8 ___ 9-12


ACTIVITY TIME: varies from 30 minutes or more

MATERIALS NEEDED: outdoor natural space

SEASON: Any

OBJECTIVES: Students will:
- write expressive pieces in response to direct experience
- develop writing that expresses creative and aesthetic content
- practice observation skills

SUMMARY: Students write poetry to express their feelings and experiences in a natural system.

SPECIFIC BACKGROUND: Incorporating poetry writing into field experiences and other ecological restoration project activities can provide students with a new perspective on the natural world. Poetry can be a way to enhance observation skills, make personal connections to a subject, or understand the subject of the writings more clearly. Insisting that students experiment with concise verse will help them hone their message and become more clear about exactly what they wish to convey to their reading audience. Four poetry forms are highlighted below: Haiku, Cinquain, Noun Verse, and Diamonte.

ACTIVITY DESCRIPTION:
Locate yourself in a comfortable spot in the natural area. You might find yourself more inspired by walking slowly, sitting still, or a combination. Consider what you are seeing, feeling, hearing, smelling, thinking and observing. Pick one of the four poetry styles described below and try to convey something about what you are experiencing.

Haiku
An ancient poetry form from Japan built on three lines using 17 syllables, usually in a 5-7-5 pattern.
*Example from Kathleen Morgan, teacher, Verona Middle School:*

*Indian Grass*
*Once upon a time*
you brushed chins of buffalo.
*Come, tickle mine now.*

Earth Partnership Program, UW-Madison Arboretum
Cinquain
Line 1 title
Line 2 description of title
Line 3 action of title
Line 4 statement or feeling
Line 5 repeated title, synonym, or rename

Example from Sylvia Marek, UW-Arboretum Naturalist

Feathers
Colorful, Light
Flying, Preening, Fluffing
Wish I could fly
Birds

Noun Verse
Line 1 noun
Line 2 2 adjectives
Line 3 2 gerunds ("ing" verbs)
Line 4 synonym

Example from Joan Field, teacher, Mendota Elementary School

Leadplant
purple, spiky
growing, stretching
Amorpha canescens

Diamonte
Line 1 First noun
Line 2 2 Adjectives
Line 3 3 Verbs
Line 4 2 words for first noun and 2 words for second noun
Line 5 3 verbs
Line 6 2 Adjectives
Line 7 Second noun (opposite of first)

Example

Prairie
Hot, multi-colored
Teaming, steaming, dreaming
Wild fired, stately crowned
Crawling, canopying, quieting
Cool, green
Woodland

EXTENSIONS:
✓ Sometimes it is useful for the class to generate a list of nouns, adjectives and verbs that can be used to describe prairie, wetland, and woodland plants and animals.
✓ Encourage students to create a poetry journal for their writings
✓ Establish a poetry reading circle at your school.
✓ Incorporate poetry writing in any future field trips or restoration project activities.

ADDITIONAL RESOURCES:

ASSESSMENT:
✓ Describe 2 types of poetry writings and provide an example of each.
✓ Write a poetry sample indoors before visiting a natural area and after visiting a natural area. Take note of the differences in writing content and style.
✓ Student poetry journals can become a portfolio of their writing abilities over time.
SPRING FEVER:
*TAKING A PRAIRIE’S TEMPERATURE*

During the winter, the soil beneath a prairie is frozen. When spring arrives, the air is warmer, the ground thaws, and the soil begins to warm up. The living roots of prairie plants have been in the ground all winter, waiting for *signals* that it is time to grow again. Finally, when the soil temperature is warm enough, the plants begin to send up their green shoots, and a new growing season begins.

Today you will measure the temperature of the air and the soil in your prairie.

**STEP 1:** *Write down today’s date and weather conditions.*

Today’s date is _____________________________.

Today’s weather is (sunny? cloudy? partly cloudy? raining? snowing?)

**STEP 2:** *Go outdoors to your prairie. Follow instructions to measure the temperature of your prairie at three places: in the air above the ground, in the soil near the surface, and 3” deep in the soil.*

**STEP 3:** *Write down the three temperatures you measured.*

The temperature of the air is ____________________________ degrees F.

The temperature of the soil near the surface is __________ degrees F.

The temperature 3” deep in the soil is ______________ degrees F.
STEP 4: Draw bar graphs of the temperatures you measured.
STEP 5: *Answer the questions below.*

1. Which was warmer, the air or the soil?

2. Which was warmer, the soil at the surface or 3” deep?

3. Why might the three temperatures be different?

4. In the spring, plants wait for the right *signals* before they begin to grow. Warm soil temperature is one *signal*. Can you think of some other *signals* that tell plants that it is time to grow? (Clue: Think about other things, besides temperature, that change in the spring).
5. Prairie roots go deep into the soil, sometimes more than 10 feet deep. What soil temperatures do you think these very deep roots would feel?

6. Fire is a part of the prairie ecosystem. Prairie fires can be extremely hot, and fires can move across the land very quickly. Where would you go to survive a prairie fire if you were:

- a bird?
- a bison?
- a rabbit?
- an earthworm?
- a prairie plant?
Creating an Underground Prairie

SUBJECT:  ___ x__ SCIENCE  ___ MATH  ___ LANGUAGE ARTS  ___ SOCIAL STUDIES  ___ ART  ___ MUSIC  ___ OTHER

GRADE:  ___ K-2  ___ 3-5  ___ x__ 6-8  ___ x__ 9-12

STATE STANDARDS MET:  Science: C.4.6, F.4.1, F.4.2, F.4.4, F.8.1, F.8.2, F.8.8, F.12.1, F.12.4


ACTIVITY TIME:  1-2 hours

MATERIALS NEEDED:  Construction materials such as thread, pipe cleaners, yarn, fabric, raffia, pompoms, crepe paper, paper clips, twist ties, burlap twine, wire and scissors

SEASON:  Any

OBJECTIVES:  Students will:
- create a model prairie root system
- learn about the structure and function of plant roots
- gain a better understanding of soil ecology, flora and fauna (see extension)

SUMMARY:  Students build a full-sized model of a prairie plant’s roots.

BACKGROUND:  Perhaps the most striking view of the prairie is one that we never see. Underneath the unassuming soil surface is an enormous, dense forest of prairie roots. The roots interlace throughout the soil, creating a complex and biologically active world. The roots are frequently twice as large as the aboveground portion of prairie plants. Think about inverting the prairie and doubling its size and you begin to gain a sense of what lies below the soil surface.

In addition to the roots, there is a complex collection of flora and fauna nested in some of the most rich and fertile soil on earth. The broadly branched and deep taproots annually slough off and regenerate approximately 50 to 80 percent of their root mass. This root matter adds a tremendous amount of organic matter to the soil contributing to the extremely high soil fertility. It is said that on any acre of prairie there was more total weight in soil organisms below the ground than there was in a bison herd above ground.

In this activity, students create full-sized models of prairie plant roots. (You may wish to provide a maximum root length for the room.) By attaching them to the classroom or assembly room ceiling, the room is then transformed into an underground prairie.

ACTIVITY DESCRIPTION:
Choose a plant from the “Prairie Plant Roots” descriptive list on the following page. With the materials supplied, you are to create a full-sized model of the root system of that plant. Try to represent all features of the root as accurately as possible. When finished, attach a name identification label to your root.
EXTENSIONS:
✓ Add models of other organisms that inhabit the underground portion of the prairie. These may include:
  prairie dog
  badger
  black-footed ferret
  mole
  thirteen-lined ground squirrel
  other rodents
  snakes
  other reptiles
  soil insects and other soil organisms

✓ Do further research on root information about a specific plant.
✓ Students can try to grow seedlings of their plant and record root growth over time. What is the ratio of root biomass to above-ground biomass change over time, if any?

ADDITIONAL RESOURCES:
✓ Prairie Enthusiasts’ Website: http://www.prairie.pressenter.com/

ASSESSMENT IDEAS:
✓ Students can make presentations on their root models and describe the plant’s unique adaptations related to the root structures.
✓ Write short narratives describing their plants’ root system and how it may aid in a prairie plants’ survival.
✓ Ensure student root models are accurately constructed and identified.

PRAIRIE PLANT ROOTS
Adapted from Where the Sky Began, by John Madsen, Houghton Mifflin Company, 1982, Boston

Compass Plant or Prairie Dock
These have deep, heavy rootstocks that drive far into the earth to subsoil moisture supplies. The tap root of an old plant may be as thick as a person’s wrist just below the surface of the earth. Although it may be less than an inch in diameter only 3 feet down, this main root may drive almost 14 feet into the prairie earth (see illustrations).

Blazing Star
The drought-resistant western blazing stars, such as dotted button snakroot, may penetrate as much as 16 feet. Professor John Weaver of the University of Nebraska found that such a plant might have few lateral rootlets until an extreme depth is reached, and then it fills the soil with small, silvery-white rootlets. A less drought-resistant eastern blazing star, the large button snakroot, has a root system that may extend only two feet into the soil.
Prairie Rose
Although not really a forb, the "half-shrub" prairie rose has a mighty root system; the roots of one older plant were found to extend almost straight down for 21 feet.

Purple Coneflower
This has a thick fleshy taproot that is almost unbranched and may reach 8 feet into the prairie soil.

Purple Prairie Clover
In the first two feet of soil, this plant has relatively few absorbing roots and rootlets but the root systems often extend downward almost 6 feet and branch widely at the lowest levels. This is a legume so its roots contain small nitrogen-fixing nodules (see illustration).

Leadplant
Leadplant roots are so strong that the pioneer plow points were said to make a sharp snapping sound when they tore through them. It was nicknamed the prairie shoestring (see illustration).

New Jersey Tea
Also called redroot, this plant was the champion bane of the pioneer plowmen. Its huge burl-like rootstocks defied many a breaking plow and ox team. The pioneer nickname "rupture root" just about says it all.

Grasses: Big Bluestem, Indian Grass and Switch Grass
Grasses produce an extremely dense mat of lateral roots and rootlets. The majority of growth is usually in the first five feet of soil (see illustrations).

Prairie Violet
Prairie violets have very shallow root systems, which grow entirely in the top foot or two of the soil (see illustration).

Prairie Sunflower
The deep roots can extend 5 to 10 feet down but the majority of the lateral root growth is in the top couple of feet. The plant spreads through underground rhizomes (see illustration).
From Seasons of the Tall Grass Prairie, Carol LaFay, Illion, Honrulda, 1980
Mixing the Seed

SUBJECT:     ___ x ___ SCIENCE  GRADE:     ___ x ___ K-2
              ______ MATH         ______ x ___ 3-5
              ___ x ___ LANGUAGE ARTS     ___ x ___ 6-8
              ______ SOCIAL STUDIES     ______ 9-12
              ______ ART
              ______ MUSIC
              ______ OTHER

ACTIVITY TIME: 15-30 minutes

MATERIALS NEEDED: seed mix, filler (sawdust, vermiculite or sand), 2 large tubs (5 gallon buckets or 30 gallon trash cans)

SEASON: spring or fall, when the seeds are going to be planted

OBJECTIVES:  Students will:
              become familiar with plant species names, scientific and common
              observe a variety of seed shape and sizes
              understand that an ecosystem must have a wide diversity of plants

SUMMARY:  Students mix the seeds and filler noting each species that is being added.

BACKGROUND

You have the seed in hand, the site is prepared and the planting celebration date is set. What do you do with that seed? While you could quickly prepare the seed mix by yourself, this is a great opportunity to involve students of almost any age. It is an opportunity to get younger and older students working together and can be done as part of the celebration with the entire school or earlier in the day with a smaller core of students.

The seed needs to be thoroughly mixed and, if you are planning to hand broadcast, an inert medium must be added to the mix. The inert medium or "filler" can be sawdust (make sure the dust is only from untreated lumber), vermiculite (available from most garden stores), or sand. It should be slightly dampened so that the seed will stick to it.

The filler serves several functions. It transforms a small volume of seed into a large volume of seed mix enabling the mix to be spread more evenly over the site. While you need to mix in at least an equivalent volume of seed and inert material, there is no problem and several benefits to adding far more filler. A large volume allows more students to be involved by planting a larger volume of mix. Why have each student plant ¼ of a small cup full of mix when they could plant 2 or 3 large cupfuls? Furthermore, if the seed mix is more "dilute," accidental spills or uneven distribution by individual students are less problematic. The filler also makes it easy to see where the mix has been spread which is especially helpful when many students are planting on a single site.

Depending on the total volume, the seed and filler can be mixed in a white 5 gallon bucket (available from most supermarket deli counters) or, for larger volumes, in a 30 gallon trash bin. After the filler has been thoroughly mixed in, divide the mixture in half and put into two containers.

If you are planting any legume seeds, legume inoculant must be mixed into the seed mix. Innoculant can be purchased at garden stores or from prairie seed distributors.
**ACTIVITY DESCRIPTION**

Distribute the packages of prairie seeds amongst yourselves. Take turns as each person with a package of seeds comes up to the front and says the name of their species. Other things about the species can be said such as the what the plant looks like, when it blooms or one fact about the plant. If you wish, the name can be written on a piece of tagboard that will then contain the names of all species in the mix.

While saying the plant’s name, pour the seed into the bucket that will contain the mix. Continue until all seeds have been added. Mix the seeds carefully by hand until it looks well mixed. Add the filler and mix again being careful to get the smaller seeds from the bottom well distributed. Carefully divide the mixture into two, equal portions. The seed mix is now ready! The next step is to sow the seed which can be done with as many students as possible and in the context of a school planting celebration.

**EXTENSIONS:**

Creating the mix is a good time to consider how the plant looks when it is flowering. Photographs from prairie seed catalogues (back issues of which are often donated to schools if requested) or coloring sheets from wildflower coloring books, could be mounted on a prairie poster or mural.

When creating a seed mix, a few seeds can be set aside to germinate so the students can observe the appearance of seedlings of each species. This will help in identification of seedlings in the spring. A seedling identification guide could be created. For more information on seed germination procedures see the Seedling Germination Procedure sheet with the Activity entitled Seed Stratification Experiments: What Does a Seed Need?

**ADDITIONAL RESOURCES:**

**Wildflower Coloring Books:**


Sowing the Prairie Seed

SUBJECT: ___ SCIENCE ___ MATH ___ LANGUAGE ARTS ___ SOCIAL STUDIES ___ ART ___ MUSIC _X_ OTHER
GRADE: _X_ K-2 ___ 3-5 ___ 6-8 ___ 9-12

ACTIVITY TIME: 1 hour

MATERIALS NEEDED: prairie seed mix, cups (enough for each participant)

SEASON: October 15 – July 1

OBJECTIVES: Students will:
- Plant their restoration and evenly distribute the seed mix
- Work as a team sowing prairie seed
- Participate in a educational and unique event

SUMMARY: As a school-wide and/or special event, students mix and sow prairie seed for their school restoration.

BACKGROUND:
For the actual planting as few as one and as many as 500 people can participate. Depending on the size of the site more than 500 could be accommodated! The potential for many students, teachers, parents and community members to become involved is one of the beauties of hand sowing a prairie restoration site. If involving many people, the planting could be done in one large group or in several small groups. In either case, make sure the boundaries of the group’s planting area are very well marked and clearly understood. Regardless of group size, we recommend organizing the sowing of seed in the way described below. While sowing seeds needs to be done carefully and everyone must clearly understand what they are to do, this can be a joyous and fun celebration.

ACTIVITY DESCRIPTION:
When sowing the seed, it is important that all areas are covered with seed, that no areas are missed and that no areas get dumped with too much seed. Line up all “sowers” along one edge or side of the planting area. Spread out the line so you are evenly spaced and the line stretches from one end of the planting area to the other. If your planting is an irregular shape, you will have to spread people out so that each person will be covering approximately the same area.

Each sower should get a container or cup. Take half of the total seed mix (see Earth Partnership for Schools activity “Mixing the Seed”) for that area and walk down the line allowing each sower to take a small, equivalent portion (half or a cupful, one handful or even have a cup or scoop in the mix). If there is seed left, go down the line again letting each person take another equal portion. The idea is to have each sower plant the same amount of seed. When everyone is ready, walk across the planting spreading your seed as you go. Plant up to where your neighbor is planting so no areas get missed. Try to make your quantity of seed last until you get to the far edge of the planting site. If you have seed left over, turn around and walk back, planting the rest of the seed.

After all of that seed has been planted, line up as before along an adjacent side of the planting. This time your planting paths will cross at right angles to the paths you planted before. Divide up the second half of the seed and plant as before.

After sowing the seeds, it is important to make sure that the seeds have good contact with the soil. The seeds can be raked in (which is a lot of work) or danced in (which is a lot of fun!). This step is quite important to get the seeds set to germinate. Dance all you want, but make sure that all areas are danced in.

Earth Partnership for Schools Program, University of Wisconsin-Madison Arboretum