A TREE IDENTIFICATION PROJECT FOR
VAN BRUNT ELEMENTARY (HORICON SCHOOL DISTRICT)
FOURTH GRADE STUDENTS

by

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ABSTRACT

The project's goal was to determine whether a tree identification unit implemented with some outdoor activities versus no outdoor activities would have a measurable affect on fourth graders' abilities to identify trees on Van Brunt (Horicon School District) Elementary/Middle School's Outdoor Site. The study could strengthen the theory of how important it is to teach about outdoor concepts, such as tree identification, in the outdoors. Moreover, it could show that not only is outdoor education imperative for higher rates of knowledge retention about outdoor concepts but also it is vital for a child's sense of place in his/her community. In addition, this project provided the opportunity for each fourth grade student to create a page describing one of Van Brunt's trees. These student-created guide booklets have been assembled and used to start an "Outdoor Site Education Bin" for Van Brunt's Outdoor Site. This type of resource provides other teachers at Van Brunt with more practical techniques for using the outdoor site for environmental education.

The methodology of this project included the creation of a fourth grade tree identification unit that infused several subjects, most notably – science. The experimental group, my homeroom, was taught the same unit with appropriate variations to the activities that allowed for them to be outdoors. Another fourth grade teacher's class was used as a control group and, therefore, only taught the tree identification concepts indoors. Instruction for the experimental group occurred in September 2006 while the control group's instruction occurred in October 2006. The experimental group was taken outside on the outdoor site at least once per week for some type of academic activity (non-tree unit related) even during October when the control group was being instructed
on the tree identification unit. This allowed for the experimental group to stay connected
to the outdoor site, while waiting to take the post-test on the same day as the control
group.

Both pre- and post- assessments were given in the outdoor setting on Van Brunt’s
Outdoor Site. In September 2006, a pre-assessment was conducted for all fourth graders
involved in the project. The post-assessment was instituted for all fourth graders, as well,
in November 2006. All students took the two tests on the same day to insure consistency
in tree appearances.

A comparison between the pre- and post- assessments’ results showed a 46% increase in correct answers for the experimental group and only a 29% increase for the control group. Also, both groups of fourth graders produced forty-three colorful and informative tree identification pages. These were separated into eight booklets, and a scavenger hunt activity was created to help guide their use on the Van Brunt Outdoor Site.

The intent of this project was partly achieved. Students benefited from nurturing
their sense of place relationship with Van Brunt’s Outdoor Site. They also created a tree
guide page that can be part of their lasting legacy at Van Brunt. However, to strengthen
the case of how important it is to teach outdoor concepts in an outdoor setting, several
changes are recommended. These recommendations include altering several activities in
the tree identification unit and then teaching the unit to more groups of fourth graders for
at least three years. It is hoped that with a larger sample size, more conclusive
conclusions could be made regarding the importance of outdoor education.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>viii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>6</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>15</td>
</tr>
<tr>
<td>RESULTS</td>
<td>18</td>
</tr>
<tr>
<td>CONCLUSIONS AND RECOMMENDITIONS</td>
<td>31</td>
</tr>
<tr>
<td>SELECTED BIBLIOGRAPHY</td>
<td>37</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>39</td>
</tr>
</tbody>
</table>
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Pre-assessment Correct Identifications</td>
<td>24</td>
</tr>
<tr>
<td>4.2</td>
<td>Comparison of Correct Identifications on Pre- and Post-Assessments</td>
<td>26</td>
</tr>
<tr>
<td>4.3</td>
<td>Gender Comparison of Experimental Group</td>
<td>27</td>
</tr>
<tr>
<td>4.4</td>
<td>Gender Comparison of Control Group Assessment Results</td>
<td>27</td>
</tr>
<tr>
<td>4.5</td>
<td>Post-assessment Correct Identifications</td>
<td>28</td>
</tr>
</tbody>
</table>
# List of Appendices

<table>
<thead>
<tr>
<th>Letter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Photographs</td>
<td>40</td>
</tr>
</tbody>
</table>
| B      | Tree Identification Unit  
Unit Scope and Sequence  
Tree Identification Unit Daily Planner Overview  
Activity sheets  
Student samples  
Additional activities  
Resources | 48   |
| C      | Assessments | 85   |
| D      | Map of Van Brunt School Outdoor Site | 88   |
| E      | Student Tree Guidebooks | 90   |
| F      | PTO Grant Application | 97   |
| G      | Project Timeline | 99   |
| H      | Student Work Samples | 101  |
CHAPTER 1
INTRODUCTION

The Purpose

The purpose of this project is to determine if outdoor tree identification activities, conducted with fourth grade students, increases their knowledge of tree types on the school’s outdoor site.

The Subproblems

Subproblem 1: Seek support from the school administration and a cooperating teacher regarding the project’s relevance and importance to the fourth grade participants and curriculum.

Subproblem 2: Create a unit focusing on tree identification which will be taught by infusion into the following subjects: language arts, math, technology, and science.

Subproblem 3: Organize two classes of fourth grade students to participate in the project. One class will be the control group with no outdoor activities while the experimental group will participate in outdoor activities.

Subproblem 4: Create a pre/post assessment to measure student knowledge of tree identification on the school outdoor site.

Subproblem 5: Facilitate the creation of tree identification guidebooks by the fourth graders for Van Brunt School’s outdoor site.

Hypothesis

A comparison between pre- and post- assessments will demonstrate that the fourth grade class at Van Brunt School that participates in the outdoor activities (experimental group) will have a significant increase in their tree identification knowledge over the class which receives no outdoor instruction (control group). A significant increase will be measured as a score of ten percentage points or higher difference between both tested groups.
Limitations

1. This guidebook will only include trees found on the Van Brunt School outdoor site.
2. This project will involve teaching across curriculum specifically integrating language arts, technology, math, art, and science.
3. The project will be aligned with Wisconsin state standards for fourth grade math, language arts, science, technology, and environmental education.
4. The project will only involve fourth graders in two classrooms during the months of September and October 2006.

The Definition of Terms

**Infusion** means to instill or inculcate a concept or concepts (e.g., tree identification) while using the skills of the focus subject (e.g., Language Arts) (Dictionary.com). The teacher infused the concept of seasons into a read aloud of *Charlotte’s Web*.

**Significant increase** refers to a gain of ten percentage points or more difference between both tested groups.

**Trees** will be defined as living plants with a noticeable woody trunk.

**Tree identification** concepts include things such as reading a dichotomous key, distinguishing between alternating and opposite leaf growth, and determining leaf vein types.

**Tree identification guidebook** is a booklet containing pictures taken of trees indigenous to the Van Brunt outdoor site. Each tree in the booklet will have pictures of its leaves, bark, seeds, and/or flowers with written characteristics and their names.

**Van Brunt Elementary/Middle School** is a part of the Horicon School District and is located in the heart of Horicon, Wisconsin (Appendix A). Horicon has a population of about 3,750, and is located in Dodge County which is found in Southeastern Wisconsin. Of the approximately 650 students that attend the school, most of its population draws from the City of Horicon, but some from the surrounding villages like Iron Ridge and Burnett. Horicon is mostly a blue collar community with the John Deere tractor plant being its main employer.
Van Brunt School Outdoor Site encompasses all school property in the direct vicinity of the school building. Finch Street separates the building from a portion of the playfields. These playfields across Finch Street to the east of the school building are also considered part of the school grounds. (Appendix D)

Assumptions

1. Tree identification books are needed for fourth grade students to use when exploring the Van Brunt School Outdoor Site.
2. The tree identification unit is appropriate for fourth graders.
3. The Van Brunt School Outdoor Site is available for us to use most of the time.
4. The production of these guidebooks will be relatively simple and inexpensive.
5. A guidebook with authentic color photographs and student-created captions will be more practical for an intended audience of first through fifth grade students.

The Importance of the Project

It is essential that teaching this unit provides students the opportunity to be outdoors! This is extremely important for the current new generation considering Richard Louv’s theory of nature-deficit disorder. According to Louv, this disorder is “the cumulative effect of withdrawing nature from children's experiences.”(2005). While at school, providing opportunities for students to learn in an outdoor environment is extremely positive. It is also important for children to have a mentor, in this case a teacher, who facilitates the outdoor learning experience. In addition, by getting them outdoors to a space which is rarely used, there is a bridge built for these students’ sense of place. They are given the chance to forge a lifelong connection to this natural place. Moreover, the emotional connection created by educating students on the tree species surrounding Van Brunt School is strengthened.

This study will also show the importance of teaching students in the outdoors. By creating a tree identification guidebook, the students have a solid purpose for learning; something that the research indicates is a benefit of outdoor learning. And, it is always important to provide kids with opportunities like this to improve their environmental sensitivity and increase the value they place on natural surroundings.
Since this project focuses on educating the students about their school outdoor site, it naturally becomes a “sense of place” issue. It is essential to a child’s “sense of place” that they connect to their local environment through people, places, and things. This project will endeavor to strengthen these connections, in general, by providing more frequent outside learning opportunities for one group of students. Thus, they will be given chances to personally connect to the outdoors. At the age of nine, having this special connection to a natural place, as a result of a mentor (teacher), provides a basis for personal investment in natural places in the future.

An instructional unit on tree identification will be the primary way in which the students will be intentionally connected to their immediate locale. They will be taught how to identify the types of trees on their school’s outdoor site. This project will increase the students’ knowledge of the many different tree species on the school’s outdoor site. By knowing the names of our school trees, as well as the natural history of and ecological impact on the outdoor site, these students will have the background knowledge necessary to ask more questions to enhance their future learning about the various tree species as well as the natural history of the area.

This project also has the potential to reinforce the theory about teaching outdoor concepts in the outdoors and how this improves the learning of outdoor environmental concepts. The students in the experimental group will become more knowledgeable of Van Brunt outdoor site tree identification through the duration of this unit.

In addition, the culminating product of the instructional unit will be for each student to create a page to contribute to a Van Brunt Outdoor Site Tree Identification Guidebook. The idea that this guidebook may be used as a reference, for years to come by other students, will give these fourth graders a great sense of purpose and direction in their learning. The prospect of leaving a legacy for future students to learn from will be a great motivator throughout the unit. When students have a purposeful motivation for learning, such as the creation of this guidebook, they are more productive in what they do. They are motivated to listen more carefully and stay on task more consistently; thus, they learn more.

Finally, this student-created tree guidebook will provide the school with a valuable and practical reference material that will give teachers something tangible to use
when they take their students to the outdoor school site. Activity ideas and basic materials will be included to make this a practical kit for learning tree identification outdoors.
CHAPTER 2

LITERATURE REVIEW

The Importance of Utilizing an Outdoor Site to Enhance Environmental Education

"Oh yes, many times our classes were held outside. I do not mean that the teachers just turned us loose! It was more like we needed the out-of-doors to complete what we learned in the primary classroom." (Hungerford and Volk, 1990)

“We may need experience in nature more than we know.”
Richard Louv
(2005)

As time ticks through this electronic age of sound and light overuse, it is vital that schools give kids opportunities to form bonds with their outdoor surroundings. It has become difficult for many children to develop a bond with nature due to urbanization, industrialization, predominance of automobiles, deteriorated social conditions, and the side effects of technology (Miller, et al. 1998). To have a healthy relationship with nature, people need to develop what is called a “sense of place”. In his book entitled, Last Child in the Woods, Louv discusses Robert Michael Pyle and how he contrasts a current world view with his view on how nature provides a more realistic sense of place (Louv 2005): “Place is what takes me out of myself, out of the limited scope of human activity... A sense of place is a way of embracing humanity among all of its neighbors. It is any entry into the larger world.” (67) The larger world can only be accessed by going
outside, not via technology. School is the channel many children need to gain that exposure to the outdoors in order to feel that sense of place in the “larger world” to which Pyle refers.

Children must be frequently exposed to the large world of nature in a close context to encourage their sense of place. Teaching students about distant nature can not be done in a consistent hands-on format, and is therefore not an effective way of teaching EE to young children. In fact, the North American Association for Environmental Education (Simmons, 2004) maintains some basic guidelines for teaching EE to fourth graders, the subjects of this researcher’s study. These guidelines include statements such as: “In these early years of formal education, learners tend to be concrete thinkers with a natural curiosity about the world around them. EE can build on these characteristics by focusing on observation and exploration of the environment – beginning close to home.” (Simmons, 2004)

As far as examining environmental issues with fourth graders, the NAAEE states a few more basic guidelines with a consistent message: “Keep it simple, keep it local, and make close links with what they’re observing and learning about the local environment.” (Simmons, 2004)

The school outdoor site is an obvious choice for encouraging the development of a sense of place in children. By teaching these fourth graders about their school outdoor site’s trees, the researcher will develop their sense of place and create a lasting emotional bond between them and the local trees. This lasting bond is vital as Louv (2005) maintains: “If children do not attach to the land, they will not reap the psychological and spiritual benefits they can glean from nature, nor will they feel a long
term commitment to the environment, to the place.” (157) Children will not fight to protect nature if they are not emotionally attached. And, a generation or more of would be caretakers of our planet will be lost.

This is a day and age of testing, testing, and more standardized testing. How to utilize time most effectively with the end goal in mind of getting a high percentage of students to test proficiently on standardized tests is a high priority. Knowing that this project will provide extra time in the outdoor classroom (and away from desks), it is reassuring to refer to Richard Louv’s article, “The Nature-Child Reunion” (2006). Louv claims “schools that use outdoor classrooms and other methods of direct-experience learning produce students with improved standardized test scores and grade-point averages and enhanced skills in problem-solving, critical thinking and decision-making.”

This project will require numerous trips outside to observe the trees of Van Brunt Elementary School’s outdoor site. To frame this project in a positive light to administration, as well as to parents, it is valuable to note what Louv (2006) maintains: “Anecdotal evidence suggests that time in natural surroundings stimulates children’s creativity.”

Educators should always try to reach every child through lessons aimed at each intelligence type. The Van Brunt School outdoor site will provide excellent hands-on learning opportunities. This will be beneficial for students with the ‘naturalist intelligence’ (from Howard Gardner’s Theory of Multiple Intelligences). They get to be involved in activities that work for their learning style. According to Maggie Meyer’s (1998) article entitled, “Learning and Teaching through the Naturalist Intelligence”, “teachers should provide opportunities (for the naturalist) that encourage sensory
observation, and data collection from observation.” Handling real leaves and observing real trees in their natural setting will provide these types of opportunities.

Teaching the infused EE concept in part in the outdoors makes sense. EE by nature focuses on the outdoors and must be taught in a real setting – the outdoors. Randler, Ilg, and Kern (2005) supported this point with their study of an amphibian conservation program for elementary students. They felt that students would retain more knowledge about newts and toads studied in the thematic unit, if they were to have some learning time with these creatures in their real habitat. Students who took part in the outdoor activities did retain a significantly higher amount of tested knowledge related to these amphibians (Randler, et al, 2005).

**Importance of Infusing Environmental Education into the Curriculum**

Infusion is a term with which many teachers are familiar. Many elementary teachers do it all the time in their day-to-day teaching. Infusion is the act of purposefully including an additional subject area into the lesson or unit of another subject. An example of infusing science and language arts into a social studies unit on the Fur Traders of Wisconsin might involve having the students write a journal entry in the first person as if they were a fur trader who had to decide what to do about a dwindling supply of beavers in the wild. Ramsey, Hungerford, and Volk (1992) explain that, “in the case of environmental education (EE), the educator carefully analyzes existing courses for places where environmental content and associated skills could be incorporated.” In other words, teachers look for places in their curriculum to use environmental activities and lessons.
Teaching about environmental concepts integrated with many subjects is a good way to help the students make real world connections. Connecting through many subject areas provides more opportunities for students with different learning styles to understand a concept. The more avenues through which a concept can be explored increases the likelihood that more kids will have a chance to be successful. In her study of learning transfer of young children, Basile (2000) reflected that, “with young children, it appears that instruction must be very clear. There is no time for hidden purpose.” It would seem that infusion of EE provides multiple points of clarification.

With infusion, instruction is clearer. A child, who may not learn a concept by listening, may learn by reading. Alternatively, a different child may learn better by handling items in a science activity. Singley and Anderson (1989) point out “effective education depends on curricula with an eye on transfer.”

Connecting curricula presents knowledge in a real world format. Infusing EE into other subjects is effective and one of the only ways of teaching about its topics. According to Wisconsin’s Department of Public Instruction (1998), “EE is interdisciplinary (so) previous efforts to define discipline-centered standards have not fully captured its essence”. This means that EE must be taught through infusion into other subject areas to be truly authentic and therefore valuable. Cohen (1994) backs this up by positing, “In early years, effective EE should begin by providing a knowledge base that is developmentally appropriate, occurs in real settings, and involves children’s active participation.”

Research supports Project Learning Tree (PLT), a main source for infusion of outdoor instruction in this project. Ramsey, Hungerford, and Volk (1992) refer to PLT as
a “window” for infusion. “It provides interdisciplinary activities “designed to supplement existing curriculum” (1992). On PLT’s website (2008), part of its goals states something similar: “PLT uses the forest as a "window" on the world to increase students' understanding of our environment.” Using PLT will only enhance the effectiveness of this researcher’s current science unit on “Ideas and Inventions.” For example, the invention of the dichotomous key was instrumental to practical species identification. The students can become knowledgeable on how to use this tool.

Infusion incorporated in EE instructional practice has a helpful impact on other core subject areas like math and science. Research conducted by the California Department of Education and the American Institutes for Research supports the notion that effective EE can have positive effects on kids’ academic success in other subject areas. They discovered that sixth-grade students in environmental based programs “improved their math and science scores 27 percent.” (Louv, 2006).

Making Environmental Knowledge Seem Important

“What we can’t name can hurt us.” (Louv 2005)

In A Guide to Curriculum Planning in EE, published by the Wisconsin Department of Education, “the knowledge subgoal (in EE) should receive major emphasis grades 3-6” (Engleson and Yockers 1994). It is interesting to note this because Randler, Ilg, and Kern (2005) maintain that, “within the context of ecology, many educational researchers have emphasized measuring psychological constructs, such as attitude, perception, and other personality factors, rather than knowledge.” That points to a possible gap in research on EE knowledge gain. With that said, it would seem valuable
to measure knowledge gain on tree identification in relation to outdoor versus indoor education treatments.

In a study of young children’s memory of natural versus synthetic creatures, Balmford (2002) discovered that children at the age of eight were able to identify almost 80% of 150 Pokemon characters. While, eight year-olds on average could only identify about 50% of wildlife species. This shows that kids at this age have the mental aptitude to learn and remember creatures. Balmford protests that, “conservationists are doing less well than the creators of Pokemon at inspiring interest in their subjects,” and that, “during their primary school years, children apparently learn far more about Pokemon than about their native wildlife.” Balmford (2002) concludes “conservationists need to reestablish children’s links with nature if they are to win over the hearts and minds of the next generation.” Linking children to nature through their school outdoor site seems like a logical avenue to try, as this project does.

In a study conducted by Bebbington (2005), “the ability of A level (high school biology) students to recognize and name common wild flowers was shown to be very poor.” Bebbington also mentions having conversations with students that suggest, “a general feeling that being able to name organisms is not important to them and that they have little interest in acquiring identification skills.” This would indicate a need to make environmental knowledge gain and specifically organism identification skills seem important some how. Making it a part of a science unit, as this project does, where it is assessed as any other school subject will strengthen its importance. And, although this level of importance may not be significant to survival as it used to be when people were
more directly dependent on the land, it does legitimize organism identification enough to keep it in their sights.

The Development of Instructional Objectives and Assessment Tools

In Marcinkowski’s “Assessment in EE” (1993), he relates there being, “basically three bodies of environmental knowledge which are commonly taught and learned.” The one body that this study will focus on is a natural science knowledge base. To assess the capturing of this knowledge, Marcinkowski (1993) relates that “alternative forms of assessment (practical, authentic, performance assessment, and portfolio) can make it easier for students to demonstrate learning relative to goals and objectives” With this in mind students will be assessed using practical and authentic methods. For example, instead of using photographs of trees, real trees on the school grounds will provide the real examples to assess knowledge of.

It is also important to recognize that students in fourth grade will one day need a knowledge base to help them act on opinions they have about environmental issues. In their 1990 article on changing learning behavior through EE, Hungerford and Volk note that “knowledge of the (issue) appears to be a prerequisite to action” Since retention of information is improved with repetition, starting to fill children’s brains with knowledge earlier in their schooling seems beneficial. Namely, filling the students’ knowledge bank with tree names could lead them to act toward saving those trees later in life.
Summary

It is important for elementary age kids to get outside and bond with their local natural surroundings. Society is at a critical juncture in its history. Children need to be given the chance to form an attachment with their local natural environment. This is not happening in today’s society as often as it should. However, as children become distanced from nature, schools can be a vehicle of connecting them to nature. By utilizing the school’s outdoor site for teaching EE, their sense of place can be nurtured.

Research shows that teaching students in the outdoors versus indoors is more multisensory, real, and enhances educational achievement.
CHAPTER 3
METHODOLOGY

Sub problem 1 – Seek support from the school administration and a cooperating teacher regarding the project’s relevance and importance to fourth grade participants and curriculum.

Before continuing this project, it is necessary that the researcher meet with Scott Miller, Van Brunt School’s principal, for approval to proceed with the study. It will be the researcher’s first year employed by the Horicon School District, and therefore it is vital that the communication about this project begins positively. Points to be addressed at the meeting will include:

- The overall purpose of the meeting is to seek approval for the researcher’s Master’s Degree project, a fourth grade tree identification unit.
- Approval will be sought for involving another fourth grade class.
- The time frame will be discussed. (September, 2006 – October, 2006)
- Background information on why this needs to be done will be provided to the administrator.

It will also be necessary to ask another fourth grade teacher to allow for his or her class to participate in this research project. These meetings need to take place before the end of August, 2006 so that the researcher will have ample time to prepare the unit of instruction.

Sub problem 2 – Create a unit focusing on tree identification which will be taught by infusion into the following subjects: language arts, mathematics, technology, and science.

It will be necessary to create a tree identification unit for fourth graders that meets with both Wisconsin and Horicon School District academic standards for language arts,
math, technology, science, and art. It is important to infuse other subjects into this environmental education (EE) unit to make it a valuable use of time in the eyes of administration, parents, and colleagues. Also, it will be necessary to incorporate some lessons from the school’s current science program (Full Option Science System - FOSS) into the tree unit. This will assist both fourth grade classroom teachers address their regular science curriculum.

In addition, outdoor and indoor variations of certain activities will need to be created and implemented to accommodate the indoor instructed control group versus the outdoor instructed experimental group.

**Sub problem 3** – Organize two classes of fourth grade students to participate in the project. One class will be the control group with no outdoor activities while the experimental group will participate in outdoor activities.

The researcher will meet with the study’s cooperating fourth grade teacher, Nancy Keller, to communicate plans for the facilitation of the project before the school year begins (August, 2006). During this meeting, the following aspects will be addressed:

- It is vital that the implementing of the tree unit be done during the same season.
- Both groups will need to be taught during consecutive time blocks in fall of 2006.
- Keller’s fourth grade class will be the control group and all activities will be conducted indoors.
- It is important for sequencing purposes that she teaches a portion of the *FOSS Ideas and Inventions* unit to both classes while the researcher precedes with the implementation of the tree unit. The tree unit will include one portion of the *FOSS Ideas and Inventions* unit.
- Scheduling issues will need to be discussed.

Also, the computer technology teacher, Linda Southworth, will be communicated with regarding use of the computer lab. The researcher will inform her regarding the
technological requirements of the project and will request her assistance in accomplishing this goal.

Sub problem 4 – Create pre- and post- assessments to measure student knowledge of tree identification on the school outdoor site

To acquire valid results, it is important that all participating students be tested with equality in mind. Since the researcher desires to know the fourth graders’ knowledge of the school outdoor site’s tree names, all students will require testing on the outdoor site. To keep confounding variables to a minimum, both groups will need to be pre-tested on the same day in early September 2006 and post-tested in late October 2006. Assessments will need to be designed to account for ease in taking in an outdoor setting. Limiting time spent on the assessments will be important to scheduling considerations. Also minimizing reading and writing components of the assessments will ensure that only the intended knowledge is assessed and not language arts skills.

Sub problem 5 – Facilitate the creation of tree identification guidebook by the fourth graders, for Van Brunt School’s outdoor site.

As a culmination to the tree unit, the fourth graders will need to be instructed on how to create a page identifying their chosen tree. They must be informed of which pieces of information will be required per page, as well as other publishing expectations. A grading rubric outlining expectations will be created by mid-September 2006.

Other materials will need to be collected or purchased by mid - September 2006. Photographs of the various parts of each tree on the outdoor school site will be taken and developed for use on each page. Also, the researcher will create a model example to show the students what is to be expected of them.
CHAPTER 4
RESULTS

Sub problem 1 – Seek support from school administration and a cooperating teacher regarding the project’s relevance and importance to fourth grade participants.

Crucial to proceeding with this project was approval from the school administration. In a phone conversation with Scott Miller, principal of Van Brunt School, the research project was discussed. From the beginning of the conversation, Mr. Miller seemed receptive regarding the points that this researcher made about the study. It was conveyed that he had a familiarity with research projects and their importance to attaining a Master’s degree.

In an earlier conversation, Mr. Miller told this researcher that he was against the practice of teachers sending their classes to other teachers for core subject instruction. He had claimed that adhering to a departmentalized schedule deterred from the spontaneity and flexibility that a homeroom teacher needed to teach effectively in an elementary classroom. However, during this particular phone call Mr. Miller stated that he would make an exception in favor of this research study and allow for this practice to take place.

As a result of this exception, the researcher felt confident contacting Nancy Keller, fourth grade teacher at Van Brunt School, to inquire as to whether she would be willing to cooperate and allow her class to participate in the research project. She agreed. This permitted the researcher to send his homeroom class to another fourth grade teacher, Nancy Keller, during October 2006. On certain days in October 2006, this researcher taught the tree identification unit to Keller’s class (control group), while she taught the researcher’s class (experimental group) another portion of the regular science curriculum.

The administration at Van Brunt School was completely supportive of this research project as indicated by the following agreements made by the principal and researcher. Permission to:

- Conduct a research study based on a fourth grade tree identification unit
- Teach a tree identification unit to two different fourth grade classes.
Teach a tree identification unit during the first two months of school in the fall of 2006.

**Sub problem 2** – Create a unit focusing on tree identification which will be taught by infusion into the following subjects: language arts, math, technology, and science

This researcher developed the unit of study on his own time outside of school. There seemed to be less room for flexibility with curriculum and academics for this researcher in his first year with the Horicon School District than would be allowed a teacher with more seniority. Therefore, all activities had to be constructed to tightly align with Wisconsin and Horicon School District academic standards. However, since no other teacher would be teaching this particular unit on tree identification, the decisions regarding unit design were made solely by the researcher. Early in the unit, it was essential to assist the students in making personal connections with trees on the school outdoor site. Instruction of tree identification concepts was the focal point in the middle of the unit. As a culminating activity, the students used what they had learned to create a guidebook page of their “adopted tree”. Several sources for lesson and activity ideas were accessed. Some of these included: Project Learning Tree (PLT); Wisconsin Forestry Education Program (LEAF); National Wildlife Federation (Ranger Rick’s Nature Scope); University of Wisconsin Arboretum; Wisconsin Department of Natural Resources (DNR EEUK website); AIMS Education Foundation, and the school’s science curriculum, FOSS (Full Option Science System). (Appendix B)

The following is a short synopsis of various curricular activities and materials used in the project. It is organized by subject area. A complete overview of the tree identification unit can be viewed in Appendix B.

**Language Arts**

- Picture books read aloud to give different perspectives on trees and provide insight into the idea of how people become emotionally attached to trees: *Someday A Tree* by Eve Bunting; *The Giving Tree* by Shel Silverstein, and *The Big Tree* by Bruce Hiscock.
Creation of tree pages – research mostly conducted using the Wisconsin Department of Natural Resources (WDNR) Forest Trees of Wisconsin Guidebook

- Leaf venation patterns packet
- Tree pages published to specified expectations on a rubric
- Write-around activity – Students wrote letters to each other explaining how to identify a tree. (student samples in Appendix H)
- Tree songs – The outdoor class sang or recited their songs while standing beside their tree; the indoor class sang in the classroom.

Math and Science

- Leaves were rubbed and measured for lengths and widths
- “Adopted trees” were observed and described (See photos in Appendix A)
- Dichotomous key was taught using a Ranger Rick Nature Scope activity.
- Properties of tree leaf and branching were taught using a Project Learning Tree (PLT) activity – Students acted out compound and simple leaves, lobed and toothed leaf blades, and opposite and alternate branching. Later, they went outside and used clues provided to find several trees on the outdoor site.
- FOSS unit, Ideas and Inventions – Students took part in an investigation which involved rubbing several varieties of leaves in order to identify the three different venation patterns. (See photo in Appendix A)
- Tree types keyed and identified using the Wisconsin Forestry Education Program (LEAF) website.

Art

- Leaf mountings (See Appendix B for the lesson and Appendix E for student samples)

Other

Several other lessons/activities remained the same for both classes, while others were either customized for the indoor class or left out altogether. These synopses discuss some of those lessons:
➢ "Outdoor Scavenger Hunt" – The outdoor class participated in a scavenger hunt to introduce the idea of “working” in the outdoor classroom. The indoor class did not participate in a scavenger hunt.

➢ Outdoor Survey – This was conducted as an introductory activity for the researcher to obtain background knowledge about each student in both groups.

➢ “Observe a Tree” – While the outdoor class had the opportunity to visit, choose, adopt, and describe properties of a tree on Van Brunt’s outdoor site, the indoor class received several photographs of trees to choose from in order to do a similar activity indoors.

➢ “Name that Tree” – While the outdoor class went outside and used the given clues to find trees on Van Brunt’s outdoor site, the indoor class was provided photographs of the various trees at various stations around the classroom.

➢ Tree guidebook culminating activity – Both classes were required to create a guidebook page to showcase their adopted tree.

In addition, the outdoor class was able to go outside on the school site for several daily routines such as: teacher read-aloud, Self Select Reading (SSR), and writing class. No tree identification information was discussed during these outings. The outdoor class was given an opportunity to participate in a photography club, as well. Six students of the outdoor class chose to give up their recess and take photos of our class’s adopted trees on the outdoor site. Several of these photos were used in the student-created guidebooks. A highlight of one of these mornings was when a photo club student caught a monarch butterfly. It was an awesome sight! (See photo in Appendix A)

Sub problem 3 – Organize two classes of fourth grade students to participate in the project. One class will be the control group with no outdoor activities while the other group will participate in outdoor activities.
During the initial meeting with Nancy Keller, fourth grade teacher of the control group at Van Brunt, a schedule was developed for the study. It was determined that the study would begin in September of the 2006-2007 school year.

The tree identification pre-test was given to both the control and experimental groups on September 6, 2006. Each child was given a set of seven sheets of paper with the name of a tree typed on each. (Appendix C) Keller and this researcher administered the test to each of the respected classes. As each class walked around the outdoor site in a line, both the researcher and Keller stopped in front of seven pre-assigned trees. At each tree, students independently displayed the sheet with the tree name that he or she thought matched the tree next to him/her. Keller and this researcher recorded whether the student was correct or not on a “Tree Test Recording Sheet”.

The unit was taught to the experimental group in September 2006. The experimental group participated in an outdoor site scavenger hunt one day prior to the tree pre-test, while the control group did not. This was done to provide an introduction to working in the “outdoor classroom.” Rules of how to behave when learning outside were discussed. For fourth graders, the novelty of learning outside versus between four walls can sometimes interfere with what is learned. With increased visits outdoors, it was hoped that the students would adapt to being outdoors and the novelty would wear off. Thus, this researcher wanted to establish from the beginning that going outside to learn would be common. Self-control was expected during these times. (See list of outdoor classroom rules in Appendix B.) The experimental group participated in outdoor activities at least once a week until the tree post-test was given.

In contrast, the control group’s only time outside was during the pre- and post-tree identification tests. The control group was taught the tree unit throughout October 2006. As far as scheduling goes, the tree unit was taught approximately three to five times per week with each period usually lasting about forty-five minutes to one hour.

A portion of the FOSS unit entitled *Ideas and Inventions* was implemented during both groups’ units of tree study. This researcher utilized the investigations on leaf venation patterns. Keller taught the remaining non-tree related portions of *Ideas and Inventions* to both groups.
Linda Southworth, the computer lab teacher, organized each computer so that particular websites with age-appropriate dichotomous tree keys could be accessed. These tree keys were utilized by both classes at various times during the tree identification unit. Southworth also agreed to monitor this researcher’s class while groups of six to eight were given the tree post-test on the outdoor site on November 9, 2006.

**Sub problem 4** – Create a pre/post assessment to measure student knowledge of tree identification on the school outdoor site.

This researcher prior to September 2006 created a tree identification pre-assessment. Each child was given the opportunity to show the tree name answer sheet they thought matched the tree in question. (Appendix C) To ensure the fairest results, the children stood in a straight line, one behind the other. Students lined up in this fashion assured less chance for a child to see another’s answer sheet. Talking was kept to a minimum. Additionally, the pace was quick to limit chances for dialogue about possible answers. It was assumed that the children would either know the tree type or not, so little time was allowed for answer consideration.

One of the parameters established at the onset was that the identification sheets could only be shown once. This was mainly enforced via the honor system. Even still, this parameter seemed to cause minor frustration with some children. Several came to a tree they thought they recognized only to realize they had already used that tree’s sheet to answer for a previous one. This displeasure occurred most often at the last tree visited; usually identified by the students as the “cherry” tree”. It was discovered later during the unit that this in fact was a crab apple tree. Nonetheless, it was the only tree on the test with noticeable fruit. The students would see the crab apples on this tree and immediately want to display their “cherry tree” answer sheet. However, they could not because they realized they had already used it for a previous identification.

Another point to note is that it appeared that most of the students were merely guessing on many of the trees. Several students were observed merely flipping to the next answer sheet behind the one just used without glancing at the other possibilities.
This seemed to indicate a complete lack of knowledge on the part of the student regarding what the tree could have been.

Table 4.1 shows detailed results of how many times each tree was identified correctly by both groups on the pre-test. Only results for trees both on the pre- and post-assessments were included in the Table 4.1. The tree most commonly identified correctly was the sugar maple. A combined total of seventeen students correctly identified the sugar maple tree. To this researcher’s surprise, the least commonly identified tree species by both classes was the largest tree on the school property, a bur oak (photo in Appendix A).

<table>
<thead>
<tr>
<th>Table 4.1: Pre-Assessment Correct Identifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td><strong>Experimental group</strong> (n = 23)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Control group</strong> (n = 22)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This researcher created a post-unit assessment prior to November 2006. (Appendix C) This assessment was also implemented outside on Van Brunt’s outdoor site. Five of the original nine trees from the pre-test were labeled with a laminated letter (A through G). Two not included in the pre-test, a green ash and red oak, *were included in the post-test*. These were included purely to satisfy the researcher’s curiosity. The researcher merely wanted to know who would recognize them. *Only the five trees assessed on both tests were counted in the final comparison tallies*. These five trees included: elm, sugar maple, river birch, basswood, and bur oak.

Groups of seven to eight students were given one of three different versions of the “Tree Identification Test” and a clipboard. (Appendix C) This researcher read the instructions of the test aloud to each group and answered any questions. The students were instructed not to talk or compare answers in any form. This was easier to monitor in such a small group.
On the afternoon of the post-test, November 9, 2006, it was partly cloudy and about 55 degrees. Tree appearances were similar to how they had been for the pre-test in early September 2006. Only a few leaves had begun to change and fall. These conditions were important because this researcher wanted to assess each student’s ability to name the trees in a similar state as they had been during the pre-test. Discussion of how trees change from season to season had been minimal during the units of study. If the trees had lost a considerable amount of leaves, it would have been difficult to fairly compare the results of the pre- and post-test.

At the tree in question, each student drew a line from a letter (A through G) to the corresponding tree name on the test form (Appendix C). No tools, such as dichotomous keys or field guides were allowed. After completion of the tests, it was discovered that not enough space was left between the answer choices, so at times the connecting lines ran together. This created some confusion during the scoring of the test. It may also have confused some of the more careless test-takers while matching letters to tree types; he or she may not have been able to tell which ones they had already connected.

Test Comparisons

After calculating the correct identifications on the post-test from both groups, several comparisons were made between the pre- and post-test results. The first was an overall comparison of correct answers from pre- to post-test counting both groups. When the total number of correctly identified trees by both groups was tabulated, there was an approximately forty percent increase. An improvement by both sets of students in identifying the assigned trees was evident.

The second comparison came between the experimental group and the control group. This comparison illustrated an overall improvement in correct tree identifications between the pre- and post-tests by both groups. However, the experimental group improved seventeen percentage points more between the two tests than the control group. Table 4.2 specifically shows the control group having less of an improvement in identifying the school’s trees when compared to the experimental group.
Table 4.2: Comparison of Correct Pre- and Post- Assessment Identifications

<table>
<thead>
<tr>
<th></th>
<th>Control group (N = 22)</th>
<th>Experimental Group (N = 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assessment</td>
<td>21/110</td>
<td>18/115</td>
</tr>
<tr>
<td>Post-assessment</td>
<td>53/110</td>
<td>71/115</td>
</tr>
<tr>
<td>Percent increase</td>
<td>29%</td>
<td>46%</td>
</tr>
</tbody>
</table>

Some variables that could account for this difference could be:

- varying levels of test-taking abilities
- test-anxiety
- test-taker indifference
- control group may have experienced outdoor novelty effect (being asked to take part in an academic task outside of four walls)
- experimental group had more direct contact with the outdoor testing site during the tree unit

Gender Comparisons

After looking at the pre- and post-test data in a few different ways, this researcher became interested in a gender comparison. When comparing boys and girls, the students in the experimental group had a smaller difference in the number of correct answer improvement. (See Table 4.3)
Table 4.3: Gender Comparison of Experimental Group Assessment Results

<table>
<thead>
<tr>
<th></th>
<th>Boys (n=15)</th>
<th>Girls (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number correct in Pre-test</td>
<td>6/75</td>
<td>6/40</td>
</tr>
<tr>
<td>Number correct in Post-test</td>
<td>47/75</td>
<td>24/40</td>
</tr>
<tr>
<td>Percent increase</td>
<td>55%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Meanwhile, the boy versus girl comparison in the control group had a greater difference. Table 4.4 confirms that the boys in the control group improved their scores more than the girls in the control group between the two tests. Each pre-assessment had five tree identifications to analyze. The eleven boys in the control group only identified two (4 percent) as a collective group. The eleven girls, meanwhile, only identified eight (15 percent) as a collective group. The post-assessment would reveal improvement for boys and girls in the control group. However, the boys in the control group correctly identified fifty-six percent, while the girls in that same group identified forty-two percent. These results could be attributed to any of the variables stated earlier under Table 4.2.

Table 4.4: Gender Comparison of Control Group Assessment Results

<table>
<thead>
<tr>
<th></th>
<th>Boys (n=11)</th>
<th>Girls (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number correct in Pre-test</td>
<td>2/55</td>
<td>8/55</td>
</tr>
<tr>
<td>Number correct in Post-test</td>
<td>31/55</td>
<td>23/55</td>
</tr>
<tr>
<td>Percent increase</td>
<td>52%</td>
<td>27%</td>
</tr>
</tbody>
</table>
Final Comparisons

When comparing the results of individual tree identification in the post-test, the experimental group had more correct identifications of all trees except for the maple species. (See Table 4.5) For that particular type, the control group had one more student than the experimental group correctly identify it. It is not too surprising that the students combined to identify the sugar maple more frequently than any of the others. Of all the many types of tree leaves, the maple leaf is probably the most recognizable, in Wisconsin.

The biggest noticeable difference in individual tree identification results was the fact that the experimental group correctly identified the bur oak ten more times than the control group. A possible explanation for this would be that this researcher used that particular bur oak, a major natural landmark on Van Brunt’s school grounds, as a meeting place for many of the outdoor activities conducted with the outdoor group. The experimental students’ familiarity with this tree may have grown with every casual mention of it whenever they met in front on the school site. (Map of school outdoor site in Appendix D) It is also worth noting that the student in the indoor group who had “adopted” that same bur oak incorrectly labeled it as a red oak during the post-test. Of course, that student had only seen his bur oak in photographs. By contrast, the student in the outdoor group who had adopted that same tree did correctly identify it. For the record, this experimental group student only correctly identified three trees with his bur oak being one of the three.

Table 4.5: Post-Assessment Correct Identifications

<table>
<thead>
<tr>
<th></th>
<th>Elm</th>
<th>Sugar</th>
<th>River</th>
<th>Basswood</th>
<th>Bur</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Number correct/ 22)</td>
<td>9/22</td>
<td>17/22</td>
<td>9/22</td>
<td>7/22</td>
<td>11/22</td>
<td>53/110</td>
</tr>
<tr>
<td><strong>Experimental Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Number correct/ 23)</td>
<td>12/23</td>
<td>16/23</td>
<td>10/23</td>
<td>13/23</td>
<td>21/23</td>
<td>72/115</td>
</tr>
<tr>
<td><strong>Total students</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Number correct/ 45)</td>
<td>21/45</td>
<td>33/45</td>
<td>19/45</td>
<td>20/45</td>
<td>32/45</td>
<td>125/225</td>
</tr>
</tbody>
</table>
Sub problem 5 – Facilitate the creation of tree identification guidebooks by the fourth graders, for Van Brunt School’s outdoor site.

As a culmination to this unit on trees, each student from both groups was given the task of creating a tree identification page for their “adopted” tree. (Appendix E) Several examples of real tree identification books were shown to the students. (Appendix B) Also, a teacher-created model example of a page was developed. This model of the aforementioned green ash tree included photos and showed what kinds of information student pages would require. Components like branching type, fruit/nut, leaves, and bark were expected to be included. (Appendix B). Students were then given a rubric to assess the model with. (Appendix B)

Students utilized a Wisconsin Department of Natural Resources tree identification booklet entitled, *Forest Trees of Wisconsin*, to collect any information they were missing. Photographs of their trees were provided for each student to put into his/her page. The children were asked to include their leaf onto the page, as well. Each student created a rough copy layout of their pages before they were given the final paper to publish on.

Overall, the process in creating the booklets went smoothly. The students seemed motivated to create their pages and worked diligently on them. This researcher informed them that these pages would be compiled into a booklet that other kids throughout the school would have the opportunity to look at and use as a reference guide for the school site’s trees. In a way, it could be a lasting legacy that the fourth graders of 2006-07 could be remembered by.

At first glance, many of the pages seem well organized, colorful, and neatly done. Many interesting and informative facts were included. (Appendix E) For example, one student commented on his basswood stating that “(it grows) throughout the state on rich, well drained loamy soil.” Reading some of the captions, one can clearly hear the voice of a child. This was in fact the intent of these pages, for kids to speak to future kid readers about their trees. For example, one student’s page focused on the crabapple variety. She commented about the fruit of this tree by saying: “The fruit may look like cherries, but they are actually apples.” Or, another child described the bur oak’s acorn as
a nut that “looks like it has a bumpy, fuzzy cap on.” Yet another described the berries on her tree as, “blue but black inside.”

When working with kids, some imperfections are to be expected. This occasion was no different. At times, the students strayed from scientific tree identification terminology. For example, instead of calling the seeds of the maple, samaras, one student referred to them as helicopters. Another student referred to the shape of her tree as a “lollipop.” Still another student incorrectly spelled the name of his tree. Finally, a page identifying the tree as a crabapple repeatedly refers to the fruits incorrectly in the photographs as cherries.

A mini-grant from Van Brunt’s Parent Teacher Organization (PTO) in the sum of one hundred dollars was put towards supplies needed for publishing these tree booklets. (Appendix F). Some items like plastic sleeves, binding rings, and special paper were purchased with this money. Eight booklets were produced. Each booklet contains about five student-created tree pages.

With some of the remaining PTO grant money, it was later decided to purchase a clear plastic bin to hold the tree booklets. This researcher developed a scavenger hunt activity to be used with the tree guides. (Appendix E) A variety of other objects (tree posters and dichotomous tree keys) pertaining to trees were included in the plastic bin. It continues to be a work in progress.
CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

The main purpose of this study was to determine if outdoor tree identification activities conducted with fourth grade students would increase their knowledge of tree types on the school’s outdoor site. The data suggests that, yes, outdoor tree identification activities did increase the experimental groups’ knowledge at a greater rate than the control groups’. A conclusion could be made, based on the results, that outdoor education led to better tree identification outcomes for the experimental group. However, despite this researcher’s initial beliefs that outdoor education would make a positive difference, there were probably too many variables to this study. Further analysis of the data showed too many variables involving the students, such as varying levels of test-taking abilities, test-anxiety, and test-taker indifference. Thus, the door opened for other conclusions to be drawn. Therefore, it is recommended to conduct this study over a longer period of time with more test groups and an adjusted tree identification unit which would focus more on tree identification skills.

Other purposes of this study did come to fulfillment, though. The student-created tree identification guides are an attractive piece for a developing school tree identification kit. Another underlying consequence of this study became a reality, as well. The experimental group had the opportunity to spend quality time outside learning about their local environment, essentially enhancing their sense of place. It was very rewarding to hear the students from the study casually comment about how much they enjoyed the tree unit they participated in the prior year. In a letter, one student essentially thanked this researcher for “teaching me to care more about nature.” Those anecdotal remarks make it hard to deny positive impacts that teaching outdoors has on students.

Community and School Support

The administration began to support and cooperate with this researcher with this project in 2006. Principal Miller’s support regarding environmental topics has been easily attainable and forthcoming thus far. Following this project’s tree unit, in winter
2006, he emailed this researcher an internet link to an environmental grant website. Also, in response to an inquiry that this researcher had to a vacated spot (due to a tree death) on the school’s outdoor site, Miller commented on e-mail: “make your dream (to replant this patch of grass with something more diverse) a reality”.

Other avenues of staff support at Van Brunt School and the city of Horicon have begun to appear since this project began in 2006. This researcher continues to maintain a cooperative professional relationship with fourth grade teacher Nancy Keller regarding environmental issues. She has expressed as recently as May 2008 that she would like to teach a summer school class on forests and trees. The Physical Education teacher has discussed the idea of beginning a compost bin at school. A former teacher at the school, Bonnie Katzman, who had given this researcher a walking tour of the school outdoor site in October 2006, and a current member of Horicon’s “Tree City USA” tree board, invited this researcher’s class to a city of Horicon Arbor Day ceremony in April 2008. Additionally, in December 2007, Andrew Rothman, assistant naturalist for Horicon Marsh State Wildlife Area, expressed an interest in a potential school site restoration project. These school and community connections all hold promise for possible future environmental education initiatives.

The Tree Unit

It is this researcher’s recommendation that the tree identification unit created for this project be altered before being implemented again. More of an emphasis should be placed on letting students use a dichotomous key to identify trees. Providing the students with the skill of using a dichotomous key would provide them with the knowledge to identify trees in any location, not just on Van Brunt’s school site. Although, dichotomous key use was taught, it could be more of a focus for student practice and assessment in a revamped tree unit. For example, dichotomous keys could be introduced differently. Through an inquiry activity, students can be led to discover important structures and characteristics of trees that assist students with identifying them. Also, the importance of knowing the names of trees can be discovered. This would enable students to recognize that the invention of the dichotomous key is very important and valuable to identifying trees.
Therefore, it is recommended that:

- More outside activities be planned for the experimental group
- More time be spent on activities that promote practice for how to use a dichotomous key
- “Adopt a tree” activities not to be conducted on the school outdoor site until more trees are planted in a condensed area of the site. In the meantime, these activities should be conducted at an alternate site such as Kiwanis City Park.

With these changes, there is hope that students would become independent tree identifiers in Southern Wisconsin and beyond – not just on Van Brunt’s outdoor site. Although, the students learned the names of several tree types on Van Brunt’s site, they may or may have been able to identify random trees in other locations due to the way the unit was designed.

Outdoor Site

In order to make this unit more practical and effective, some physical changes would have to be strongly considered, as well. With the way that the school’s trees are situated on the property, it is difficult to monitor and effectively assist up to twenty-three students in a timely manner when doing activities that require a large amount of trees. (See map of school outdoor site in Appendix D) In the near future, going to a city park a half mile away to conduct the outdoor portions of the unit might be feasible and more practical. Down the road, planting a diverse array of tree seedlings in close proximity to one another on the school’s site would be advantageous to conducting certain activities in this tree unit. With those changes to the unit’s emphasis and learning environment, it would be interesting to teach this unit to another set of experimental and control group fourth graders. Providing an opportunity for new students to demonstrate their knowledge of tree identification to members of the community would be a motivating culminating activity to this unit. It is this researcher’s belief that students would work hard to become effective tree identifiers. The tree identification pages created could be utilized to help guide the tour for community members.

33
Research Study Variables

Conclusions to this project’s question may be more decisive if some variables were brought under control. For example, the post-assessment could easily be given at the end of each unit per group instead of waiting to give it on the same day to both groups. If teaching of the units was timed correctly, seasonal changes would not be a factor. The current results could be considered skewed because the experimental group was aware of the trees and the tree unit for a month longer than the control group. This may have been an unfair advantage for the experimental group.

Secondly, with student-teacher rapport being very important at this age, it could be fairer for this researcher to teach the unit as an indoor unit one year and as an outdoor unit the next school year. This way, the variable of teaching to another teacher’s homeroom would be eliminated. The researcher would guide solely his homeroom students through the units. There is no way to measure the impact this variable might have, but as indicated earlier, it could be fairer for both groups. It may have been an advantage for this researcher’s students to be taught the tree unit by their homeroom teacher.

A conclusion could be made based on the experimental group’s better performance on the post-assessment that outdoor education led to this result. The results of this research project seem to indicate that outdoor concepts, such as tree identification, would be most effectively taught in the outdoors. However, data from only one set of fourth graders seems difficult to rely on. Important considerations are the many variables of individual test-takers: motivation, ability, and anxiety. These will occur for any age group or academic area. In this case, a way to control these testing variables might be to conduct the same tree unit for at least three years. Finally, comparing the post-assessment results to determine if there are any trends between the experimental and control groups over that period of time would be of interest to this researcher.

As far as comparison studies go, it is recommended to access what the students who participated in the tree identification unit in fourth grade retained after a couple of years. Both groups of students could be given the post-assessment the following year after the unit completion. Once the scores were compiled, the results of these post-tests
could be compared to see which groups retained more tree identification skills and knowledge.

Project Assessments

As a result of the above stated, this researcher recommends changing the scope of what is assessed during the post-assessment. These changes would coincide with the suggested changes for the unit itself (see sub problem 2 in this chapter). For example, instead of completing the assessment on the school outdoor site, students would be led to a different site. At this new site, the children would be asked to identify trees that they had not formally seen during the tree unit. Use of a dichotomous key would be required. A clearer idea of what they know about the skill of tree identification could be attained in this way. Identification of tree parts could be included in the assessments. For example, they would be asked to name tree “A’s” branching type.

Tree Unit Culmination Activity

Creation of the tree identification guidebooks should be continued for the next tree unit. Becoming very familiar with a particular tree on the school outdoor site, or near the school, is very beneficial for the student’s sense of place. Creating this guidebook page is a tangible project to conclude this unit. Why stop there, though? The student-created guidebooks would be used during tours of the outdoor site. This would provide a chance for each student to share what he or she learned about trees in a much more direct and perhaps fulfilling way. It also would be an opportunity for the fourth graders to connect to the community. It might also be possible to use this tour as a fund raiser to raise money to purchase new trees for the school outdoor site. Students who participate can experience a feeling that goes beyond the four walls of the classroom. They can experience what it feels like to impact the school and city community in a positive way!

Implications

Regardless of the results of this study, this unit on trees has provided a spark for what can be accomplished when an outdoor unit is well planned and implemented. It can
be a positive educational experience as well as enjoyable and memorable. Much more can be realized from what was started here, however. There are many more objectives to consider in the future. Firstly, this unit or other themed science units (perhaps even birds) could become mainstays in the fourth grade science curriculum. Teaching the unit this way would be an expectation, not a novelty. Thoroughly involving the school outdoor site in the tree unit on a yearly basis can unite a community of kids who will always remember something about their school outdoor site; again, nurturing their sense of place in the school community.

It will be vital for the future growth of the outdoor site’s use for educating students to involve at least one other teacher in the process. The designated teacher would understand the value of the school’s outdoor site and how it can be used to help educate students. Perhaps a way to lure another educator may be to develop a more diverse landscape on the school site. Follow the “If you build it, they will come” mantra. As was mentioned before, with fund-raising, new tree purchases would enhance the site. Replacing some grass lawn with a small prairie habitat would make the school site’s landscape even more attractive for educational use opportunities. A great deal of work will be involved, but the cause of a strong environmental education program is very worthwhile.
SELECTED BIBLIOGRAPHY


Appendix A

Photographs
Proud of his newly adopted crabapple tree!
Proud of her newly adopted river birch tree!
“Hey, my very own GIANT bur oak tree!”
Rubbing for Leaf Vein Patterns
Photography Club: Special Visitor!
Bur Oak – largest tree on Van Brunt School property (located on NE corner)
Van Brunt Elementary/Middle School
Horicon, Wis.
(Est. 1921)
Appendix B

Tree Identification Unit
Unit Scope and Sequence
Tree Identification Unit Daily Planner Overview
Activity sheets
Student samples
Additional activities
Resources
Tree Identification Scope and Sequence

Day 1: Experimental group does scavenger hunt.

Day 2: Issue the Tree Identification pre-assessment

Day 3: “Observe a Tree” (Students adopt trees)

Day 4: Measure adopted trees – Read from “Leafy Facts”

Day 5: “Name that Tree”

Day 6: FOSS (Full Option Science System) activity – rubbings/leaf vein patterns

Day 7: FOSS (Full Option Science System) activity – rubbings/leaf vein patterns

Day 8: “Keying out Trees” – dichotomous key introduction

Day 9: “Keying out Trees on the Internet”

Day 10: Make your own tree guidebook page!

Day 11: Make your own tree guidebook page!

Day 12: Tree Songs

Day 13: Write around assessment activity, review, and study guide for practical portion of final assessment

Day 14: Issue the Tree identification post-assessment and wrap-up
Tree Identification Unit Daily Planner Overview

Day 1 – Issue the Tree Identification pre-test/ Scavenger Hunt

Part 1- The procedures for giving the test will be the same for both groups. Both the pre and post test will be given the same way and day to each class in the same location, outdoors. I will explain to both groups that “they will be part of something I am doing to become a better teacher. In the process, they will get the chance to help put together a booklet that other classes will be able to use to identify what trees are on our school grounds.” Show them my old tree book – “What you help make may last a very long time at Van Brunt, like this one I did in 5th grade!” It still has leaves in it and it was poorly mounted in the first place! Emphasize this special opportunity!!!

Tell them that “the first thing I need to find out is how much they know about trees to begin with. One thing I’d like to know are which trees can they name on our school grounds.”

Then, each child will be given a file folder containing 7 sheets of paper with a large printed name of a tree type on each. We will walk as a class to a tree on the school grounds. There I will ask them to look at the tree and tell me what kind of tree they think it is by flipping to the paper with the tree name on it in their file folders. On my signal, they will all show me their answers. I will use the test recording template to record their answers using a symbol for what tree they answered. For example, if they show the ‘burr oak’ paper, I will mark a * for that answer, or if they show basswood, I will mark a smiley face.

Part 2 – Scavenger Hunt – Same lesson, different setting for each class. My class will get the outdoor treatment, while the other class will scavenge for a few natural items in the classroom. A different scavenger hunt template will be used for each group.
Outside Survey

Outside Recreation - outdoor activities that do not involve sports rules or organized competition.

1. What type of outdoor recreation activities have you participated in? (Please mark ✓, and write any others below)
   ___ Playing ___ Backpacking ___ Bicycling
   ___ Bird watching ___ Camping ___ Climbing
   ___ Cross-country skiing ___ Downhill skiing ___ Fishing
   ___ Hiking ___ Canoeing ___ Kayaking ___ Rafting
   ___ Snowshoeing ___ Running ___ Snowboarding
   Other: _____________________________________________

2. When you do these activities, who do you most often do them with?
   ___ Mom, Dad, and brothers or sisters
   ___ Grandma and Grandpa
   ___ Friends
   ___ Others _______________________________________

9. How often did you play outside this summer?
   ___ Everyday
   ___ Every other day
   ___ One time a week
   ___ One time every two weeks
   ___ Once a month
   Not at all
Activity 1: Scavenger Hunt

Objective: Students will begin to become acclimated to spending time outdoors in an educational setting. Students will learn of rules and expectations when spending time learning outside.

Materials: School Yard Scavengers sheet, ruler, disposable gloves, a paper bag, and a plastic container (variation for indoor group: leaves, barks, animal pictures (mealworms), pine cones, plant stems, feathers, animal track sheets, books containing animals, logs)

Procedure:
1. Ask “Did you bring your tools with you today?” Discuss senses and what they’re used for. Introduce the activity and touch on some vocab words on the sheet like hollow, moss, lichens, droppings.

2. Discuss outdoor classroom expectations (OCE’s). Guide them towards certain important ones like: respecting nature, respecting each other, staying on task, following directions/listening to the teacher. Stay within eyesight of me. I’ll be keeping track of all those expectations. Those not following will spend time out instead of in the action.

3. Lead them outside for a 30 minute ‘hunt’. Six groups of 4 (2 boys/ 2 girls; one group will be three. I select groups by seating arrangement/gut feeling.

4. Gather outside under the big Oak. Discuss how it went. I’ll tell them what I noticed, and they tell me how they thought it went –

leaders –

cooperation –

respect for each other examples –

staying on task –

good descriptions (verbs too) –

respect for nature examples –

Ask them if they noticed any examples that I didn’t mention from their groups. Tell them they have one last job to decide who will share what they found. Write names in each box. (Show them).

Come inside for closure: Groups share. Wrap-up by saying we’ll be spending hopefully lots of time in the outdoor classroom this year!
**School Scavengers**

**Directions:** As a group find each of the items on the chart below. You can use a ruler, disposable gloves, a paper bag, and a plastic container to collect your items. When we get back to the classroom, your group will get to show off your collected treasures. Stay with your group, follow outdoor classroom expectations, and have fun!

<table>
<thead>
<tr>
<th>ITEM</th>
<th>WHERE FOUND?</th>
<th>APPEARANCE (DESCRIBE)</th>
<th>SIZE (when appropriate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 different kinds of leaves</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>2 cones</td>
<td>1.</td>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>Evidence of animal life - tracks, feathers, droppings, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moss or lichens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals under rocks or logs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample of water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insect eggs on the underside of a leaf</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piece of bark</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hollow plant stem</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Day 2 – “Observe a Tree”

Part 1 -

*Title: “Observe a Tree”* – Content includes using observation skills (science) to describe a tree (language), collect and record data (math), and write a descriptive essay (language).

*Objective:* SWL to describe using verbs and adjectives.


*Procedure:* 1. Read *Someday a Tree* by Eve Bunting. Discuss how the tree was valued in the book and ask whether there’s anything they value that has recently been destroyed by a careless mistake (I will tell them about my accidentally thrown out baseball memorabilia story). Then, students could write further about these incidences in writing block of notebook.

1a. Brainstorm as a class verbs to describe – prompt w/ “Describe the oak in the story”. I record these on butcher paper.

2. Teach/model how to technically draw something (use a tree branch).

2a. Students choose a tree they’re interested in on the playground (picture of a tree will be used for indoor class). They will be given a “Tree Notebook” (from “My Nature Journal”, UW-Arboretum) to draw a picture of their tree in all 4 seasons starting with a late summer drawing in early September. They will really “get to know this tree” by observing it with their senses and describing it. They will also need to do a bark rubbing for use on Day 9’s lesson. I will have them draw a Circle Map on the back of their drawing sheet to use as a recording organizer for their descriptions (focus on verbs like “swaying”, “crackling”). Parent volunteers to help take pictures of the kids with their trees.
**Observe a Tree**

<table>
<thead>
<tr>
<th>Name</th>
<th>Observations about the Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start at the trunk and walk 30 steps away from your tree. Sit down and tell at least 5 things you notice about your tree from this new spot.</td>
</tr>
<tr>
<td></td>
<td>Tell your feelings about your tree.</td>
</tr>
<tr>
<td></td>
<td>What does it mean to you?</td>
</tr>
<tr>
<td></td>
<td>What do you hope for it in the future?</td>
</tr>
</tbody>
</table>

**Observations about the Tree:**
- Tell at least 5 things you notice about your tree when you lay under it. (Ideas: trunk, leaves, smells, berries, evidence of animal life, sounds, appearance)
- Tell your feelings about your tree. What does it mean to you? What do you hope for it in the future?
Day 3 -

Part 2 – Objective: SWL to measure the height or circumference of a tree.

1. They will also measure it using a thumb method (see “Measure a Tree”). Do some practice measuring and multiplying as warm-ups. Have them measure a couple different trees outside and record/compare measurements. Then, they measure and record their adopted tree. Indoor kids will learn to measure circumference. Where, I will bring in tied strings taken from the outdoor trees and have them measure and record those.

****Then, (Later in writing block, we can use this as a writing focus activity of descriptive writing; using their notes, they will be guided through the writing process to help them write an essay telling about their time spent with their tree as well as a detailed description of it. Share these with the class.)

2. Finally, require that the outdoor group go home and measure the tallest tree in their yard. This information will be part of an ongoing bulletin board displaying neighborhood tree information.

EE goal(s) addressed: Knowledge – Students learn many uses of trees, information (height, texture, smell, etc.) about their particular tree, and the diversity of kinds of trees on school grounds.

Attitudes/values – Students see examples of the importance of trees, as well as make a personal connection to a tree they may see everyday at school.

Teaching methods: read aloud, discussion, independent observation, journal recorders, guided/independent writing.


Assessment: I will observe their measurements and record their accuracy.

Wrap-up – Students need to give me a “how to do it” list for measuring a tree height or circumference.
Day 4 – “Name that Tree” PLT (On this day, tell the kids to bring in a couple leaves from trees in neighborhood or in yard, in a plastic bag for day 6 activity)

Objective: SWL what characteristics are used to identify trees.

HSD standards: S-B4, S-B2, S-B1,

WSS: EE-A.4.2, A.4.3

Materials – make copies of drawings of leaves of 7-10 trees, second sheet will contain clues about the tree w/ a place to write tree name, branches with several leaves of 2-4 types.

Mystery Tree – Ask kids what characteristics might be used to identify a tree. Record on chart paper.

Pass out branches – ask same question as above a second time. Record these on same paper. Have kids act out simple/compound and opposite/alternate branching.

2. Tell them about any other ways that weren’t brought up making sure to include: leaf characteristics (bases, tips, edges, compound/simple, alternate/opposite branching).

3. Pair activity – Assign pairs to use prepared matching sheets to identify the tree it describes. Do one or two together. The school grounds will be used for the outside group; indoor group will be shown pictures of trees and will have to use the collection of pictures to identify. No names will be used yet (and I will tell them this too) because they will be in charge of identifying the names of the trees in the coming week. So… each tree will be labeled with a number like it was in the pre test.

4. Discuss what they thought (under the big oak tree, if weather permits).

Wrap-up can be to name one way trees can be identified.
Trees to look for:

- Red Pine
- Norway Maple
- American Basswood
- American Elm
- Bur Oak
- Sour Cherry
- River Birch
Trees to look for...

- Slow-grower
- Broad leaves
- Has largest acorns and rounded lobes on leaf
- Bristles cover acorn cap

It's a: bur oak

Clues to help:

- Bark is very paper-like (hint: look up)
- Orange/brown twigs
- Toothy leaves

It's a:

- Bark is not paper-like
- Smooth and shiny fruit

It's a: sumac

- Alternating leaves
- Healthy one can live up to 275 years
- Huge droopy branches
- Under the leaf is fuzzy

It's a:

- Opposite leaves
- Gray/brown bark
- Yellow leaves in fall
- Not native to Wisconsin

It's a: Norway maple

- Fast growing
- Scaly looking bark
- Needles are in pairs

It's a: red pine

- Sometimes called the Bee Tree
- Heart-shaped leaf
- Long trunk
- Gray-brown bark

It's a: American beech
Day 5 – FOSS (Full Option Science System) “Ideas and Inventions” Module –
“Rubbing” Investigation – Introduction lesson –
HSD standards: S-A1, S-A7, S-B4
WSS: EE- A.4.1
Objective: SWL how “rubbings enhance textures/patterns that are not readily visible as well as the definition of texture.” (FOSS 3).
1. Follow the FOSS guide. It provides background information and practice for why rubbing to learn about texture is important.
2. (After the lesson) Read aloud block – Read The Big Tree (under the big Bur Oak) by Bruce Hiscock to discuss many aspects of trees like life cycle, growth, history, rings, etc… Have students collect a ‘good’ leaf from their adopted tree. (I will provide adopted tree leaves to indoor group.)

Day 6 - FOSS “Ideas and Inventions” Module – “Rubbing” Investigation – Leaf rubbings
Objective: SWL that rubbings improve our ability to see a leaf’s vein patterns, what a vein does, and the three types of vein patterns.
Materials: bags containing different leaves, clipboards/textbooks for rubbing board, (if doing outside)
Kids should bring in leaf samples (and should have theirs from adopted school grounds tree), but I will have quite a few sample bags made up of several types of leaves to use during rubbing activity.
Follow FOSS plan book. (Use p. 78 of “Budding Botanist” as a place for them to rub their own tree’s leaf.)
Wrap-up could be for them to name a type of leaf and what its characteristics are. (ex. Simple has only one stem)
Read aloud block or Guided Reading Block for Four Blocks: Read “More Leafy Facts” and “Leafy Facts” (“Budding Botanist”) to them or have them “Read to find out” facts off either sheet. Create a sheet of questions for this activity.
Day 7 – Tree Identification/dichotomous keys

Objective: SWL to key out trees using a dichotomous key.

HSD standards: S-B1, S-B2, S-B4, S-L3

WSS: EE-A.4.3, 4.2, 4.1, 4.4


Part 1:

1. Introduce dichotomous keys by doing the “Keying out Kids” activity in “Trees are Terrific”. Call it a “People Key”.
   - Key out myself as an example.
   - Pair them up according to plan
   - Extra: Have a guest come in and try to discover their names by keying them out.

Day 8 -

Part 2 – Leaf keying

Objective: SWL how to use a dichotomous key for identifying trees.

HSD standards: S-B1, S-B2, S-B4

WSS: EE-A.4.1-4.4

1. Review leaf vocabulary – ex. Lobes, simple, compound (drawings on board or show branches from the other day)

2. Dichotomous – Chant it (Dich – oto – mous) which means to divide into two parts. Do a couple of examples together on pp. 21-22. Then, in pairs have them key them out. Discuss answers
LEAF KEY

1. Leaves are shaped like needles ...................................................... [WHITI]
   Leaves are broad and flat ...................................................... [SITKA SP]

2. Long needles grow in bunches of five ........................................ [WHITI]
   Needles are short and grow singly along the branch ..................... [SITKA SP]

3. Leaves are opposite ........................................................................ [SILVER MAPLE]
   Leaves are alternate ....................................................................... [SILVER MAPLE]

4. Leaves are simple ........................................................................... [SILVER MAPLE]
   Leaves are compound, Leaflets grow around the stem in a circle .... [HORSE CHESTNUT]

5. Leaves are simple ........................................................................... [WHITI]
   Leaves are compound .................................................................... [WHITI]

6. Leaves are lobed .............................................................................. [WHITI]
   Leaves are toothed ......................................................................... [WHITI]

7. Leaves are long and slender ......................................................... [WEERING WILLOW]
   Leaves are rounded ........................................................................ [CHOKE CHERRY]

8. Branches have thorns ................................................................... [HONEY LOCUST]
   Leaflets are toothed ....................................................................... [BLACK WALNUT]

Opposite leaves grow directly across from one another, in pairs.

Alternate leaves grow singly along the branch, with space between each leaf.

A simple leaf is made up of only one leaf blade.

A compound leaf has many leaflets.

Toothed
Day 9 – Tree keying using a website

Objective: SWL. what their adopted tree species is.

HSD standards: S-B2

WSS: EE-A.4.1-4.3

Materials: “Tree identification checklist” sheet and “What kind of tree do I have?” sheet

1. Discuss final product and that they need to know what their tree is in order to make an identification page for it.

2. Ask if anyone knows how they might find that out. (Tree guides, dichotomous keys, ask an expert).

3. Go over the website activity with them. Do some examples on LCD projector for them on the LEAF and/or EEK! websites.

4. If they have their checklisted items with them, they may begin. Those without will key out the provided ones on the computer and/or finish missing checklist items in the lab.

5. Wrap-up with a discussion of how it went and what their tree is. Do they have any of those in their neighborhoods?, etc.....

6. Back in the classroom, have students press their leaves between newspaper and place a piece of cardboard and heavy book on them for tomorrow’s activity. (If leaves are not moist anymore, disregard.)
What Kind of Tree do I have?

1. Bring all of your checklist items for your tree with you to the computer lab. Double check your list now!
2. The website to type in is: http://www.uwsp.edu/leaf
3. Click on TREE IDENTIFICATION.
4. Click on LEAF TREE KEY.
5. Look on the right side of the screen. Start choosing by clicking on what you see your tree has - needles or broad leaves.

Some people may have chosen a tree that doesn’t seem to match this key. If this has happened to you, try this website. It’s called EEK!

Type in:
http://www.dnr.state.wi.us/org/caer/ce/eeek/veg/treekey/treestart.htm

If you have finished identifying your tree, try another tree on the LEAF website.

Look on the left side of the screen. Click on a number under where it says: “Choose a tree to identify”. HAVE FUN!
Keying Trees on the Internet

Directions: Circle the one that matches your tree.

Tree #1
1. My tree has (broad leaves - or - needles).
2. My tree has (simple -or- compound) leaves.
3. My tree has (opposite - or - alternating branches).
4. My tree has (rough ridged, smooth, or paper-like) bark.
5. Does your tree have any other special characteristics that might set it apart? ______________________

6. I think my tree is a ______________________

Tree #2
1. This tree has (broad leaves - or - needles).
2. This tree has (simple -or- compound) leaves.
3. This tree has (opposite - or - alternating branches).
4. This tree has (rough ridged, smooth, or paper-like) bark.
5. Does this tree have any other special characteristics that might set it apart? ______________________

6. I think this tree is a ______________________
Day 10 – Create tree identification pages

Objective: SWL to preserve a leaf by pressing it. They will create a published page to be included in a Van Brunt Elementary/Middle School Grounds Tree Guide Book!

HSD standards: Language – E.3, F.1
WSS: EE-A.4.4

Materials: cardboard, transparencies, masking tape, a helper parent, tag board, glue, crayons, colored pencils, scissors, all checklist items, and scrap paper.

1. Show my model page that I made of an Ash tree.
2. They will have to make a rough design (including spelling) of how their page will look and call me over to see it before starting on their final published piece. Again, remind them of the everlasting nature of this assignment.
3. Some may have more than one tree that they have collected from. They may work on multiple pages as long as they show me their rough design first.

Day 11 – Tree guidebook page work time.
# Tree Page Rubric

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>You have one helpful clue for every picture or display.</td>
<td>You have one helpful clue for 3-4 pictures or displays.</td>
<td>You have one helpful clue for 2 of the pictures and displays.</td>
<td>You have only one helpful clue on your page.</td>
<td>You have no clues written on your page.</td>
</tr>
<tr>
<td>All writing is neat and attractive.</td>
<td>Most of your writing is neat and attractive.</td>
<td>Some writing is neat but some sloppy.</td>
<td>Lots of writing is sloppy.</td>
<td>All of your writing is sloppy.</td>
</tr>
<tr>
<td>All glue and cutting looks nice.</td>
<td>Most glue and cutting looks nice.</td>
<td>Some glue and cutting is neat but some sloppy.</td>
<td>Lots of glue and cutting is sloppy.</td>
<td>All of your gluing and cutting is sloppy.</td>
</tr>
<tr>
<td>Capitals, spelling, and punctuation is used correctly all of the time.</td>
<td>You have one or two capital, spelling, and punctuation mistakes.</td>
<td>You have 3 or 4 capital, spelling, and punctuation mistakes.</td>
<td>You have 5-6 capital, spelling, and punctuation mistakes.</td>
<td>More than 6 capital, spelling, and punctuation mistakes.</td>
</tr>
</tbody>
</table>
Clues to Find My Tree

My Leaves are pinnate and compound with 7-9 leaflets per leaf.
Teacher non-example of a tree guide page.
Activity: Leaf Mounting

Objective: Students will preserve a real example of their tree's leaves.

Materials:
- a. leaf
- b. glue, scissors, and crayons
- c. think cardboard
- d. background paper (different color than leaf)
- e. masking tape
- f. clear plastic (i.e. transparency scrap, lamination scrap, saran wrap)
- g. ruler

Procedure:
1. Find a healthy leaf
2. Place leaf on cardboard and frame it. Using the ruler, draw four straight sides around it.
3. Cut out cardboard piece.
4. Trace cardboard shape onto background paper and cut out.
5. Trace cardboard shape onto clear plastic and cut out.
6. Glue background paper onto cardboard piece.
7. Attach leaf to background paper with a few light dabs of glue.
8. Cover leaf with clear plastic piece and attach using masking tape along the edges.
9. Color the masking tape frame with crayons if desired.
Assessment Activity: “Write around”

Objective: Students will explain how to identify a tree in a note to a classmate.

Materials: blank paper and pencil

Procedure:
1. Discuss rules of a write around
   a. Initially, they have three minutes to write about the prompt.
   b. Pass their paper to neighbor on left.
   c. They then have two minutes to read and respond (i.e. ask a question or state a disagreement) to neighbor’s writing.
   d. These paper exchanges continue for as many times as the teacher prefers.

2. Read the writing prompt aloud: “Tell someone how you would go about identifying a tree. What kinds of things would you do and think about?”

3. Closure: Teacher can read these over and share a few examples now or later.
Activity: "My Tree Song"

Objective: Students will create a song that helps themselves and their classmates remember important things about their tree.

Materials: paper and pencil, tree guide page

Procedure:
1. Discuss important things to help identify trees.
2. Model a song about a tree's helpful characteristics (i.e. simple or compound leaves) sung to the tune of "The Wheels on the Bus".
3. Name other children's tunes that may be used to write song (i.e. "Mary had a little lamb", "Row, row, row your boat").
4. Work time.
5. Share either in the classroom or outside standing by their tree.

*The Leaves on the Green Ash (sung to the tune of "The Wheels on the Bus")*

The leaves on the green ash are compound, Compound, compound
(repeat) all over the tree!

The branches on the green ash are alternate, alternate, Alternate
(repeat) all over the tree!

*Rustle, Rustle Little Tree (sung to the tune of "Twinkle, Twinkle, Little Star")*

Rustle, rustle little green ash
How I wonder what you are...
Leaves are compound with alternate branching,
And your bark is not papery....

Rustle, rustle little green ash
Now I know what you are!
My Tree Song

Your goal is to create a song that helps your classmates remember important things about your tree. Below are the key characteristics to help identify a tree. Use your tree page to help you remember these facts about your tree. Circle one for each choice.

You will need to use these facts in your song and your tree’s name (if you know it). HAVE FUN!

Leaves are: simple or compound
Branching is: opposite or alternate
Bark is: papery or not papery
Leaves are: toothed or lobed
My tree has fruits/nuts or no fruits/nuts showing
## Tree Study Guide

Important words to help identify trees:

<table>
<thead>
<tr>
<th>Leaves</th>
<th>Bark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - broad leaves or needles</td>
<td>1 - paper like or not paper like</td>
</tr>
<tr>
<td>2 - lobed or toothed</td>
<td>2 - ridged or scaly or smooth</td>
</tr>
<tr>
<td>3 - simple or compound stems</td>
<td></td>
</tr>
<tr>
<td>4 - alternate or opposite branching</td>
<td></td>
</tr>
<tr>
<td>5 - palmate or pinnate or parallel veins</td>
<td></td>
</tr>
</tbody>
</table>

- **Opposite Branching**
- **Alternate Branching**
- **Simple Leaf**
- **Compound Leaf**
- **Coniferous (Evergreen)**
- **Deciduous (Hardwood)**
Red Oak  Green Ash  Rock Elm

River Birch  Basswood  Hackberry

Sugar Maple  Bur Oak  American Elm

Cut apart

Red Pine or Norway Pine
(Pinus resinosa)
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad leaves</td>
<td>Broad leaves</td>
<td>Broad leaves</td>
</tr>
<tr>
<td>Alternate branching</td>
<td>Opposite branching</td>
<td>Alternate branching</td>
</tr>
<tr>
<td>Simple leaves</td>
<td>Compound leaves</td>
<td>Simple leaves</td>
</tr>
<tr>
<td>Pinnate vein pattern</td>
<td>Palmate vein pattern</td>
<td>Palmate leaves</td>
</tr>
<tr>
<td>Toothed leaf blade</td>
<td>Toothed leaf blade</td>
<td>Pointed lobed leaf blade</td>
</tr>
<tr>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad leaves</td>
<td>Broad leaves</td>
<td>Broad leaves</td>
</tr>
<tr>
<td>Alternate branching</td>
<td>Alternate branching</td>
<td>Alternate branching</td>
</tr>
<tr>
<td>Simple leaves</td>
<td>Simple leaves</td>
<td>Simple leaves</td>
</tr>
<tr>
<td>Palmate vein pattern</td>
<td>Palmate vein pattern</td>
<td>Palmate vein pattern</td>
</tr>
<tr>
<td>Toothed leaf blade</td>
<td>Toothed leaf blade</td>
<td>Toothed leaf blade</td>
</tr>
<tr>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
</tr>
<tr>
<td>Heart-shaped leaves</td>
<td></td>
<td>Bark is papery and orange in color</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad leaves</td>
<td>Broad leaves</td>
<td>Broad leaves</td>
</tr>
<tr>
<td>Alternate branching</td>
<td>Alternate branching</td>
<td>Opposite branching</td>
</tr>
<tr>
<td>Simple leaves</td>
<td>Simple leaves</td>
<td>Simple leaves</td>
</tr>
<tr>
<td>Pinnate vein pattern</td>
<td>Palmate vein pattern</td>
<td>Palmate vein pattern</td>
</tr>
<tr>
<td>Toothed leaf blade</td>
<td>Smooth lobed leaf blade</td>
<td>Pointed lobe leaf blade</td>
</tr>
<tr>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
<td>Bark is not papery</td>
</tr>
<tr>
<td>Uneven leaf base</td>
<td></td>
<td>Acorn nuts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Samaras (helicopters) seeds</td>
</tr>
</tbody>
</table>

Cut out these practice cards. Practice them by reading the clue side first. Many times you will notice that there may only be one difference between tree clues. Pay attention to those small differences. Match the correct clues to the correct picture card. Ask Mr. McKean for a key when you are done.

<table>
<thead>
<tr>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle-shaped leaves (coniferous)</td>
</tr>
<tr>
<td>Needles in cluster of two</td>
</tr>
<tr>
<td>Bark is not papery</td>
</tr>
</tbody>
</table>
Scavenger Hunt

Use the Forest Trees of Wisconsin booklet to find the answers to these questions. Hint: the Table of Contents is a great place to start.

1. I am a conifer. I am a type of cedar. I am a favorite winter food for some birds. My fruit is a dark blue berry-like cone. I am a

2. I am a deciduous tree. I am a type of maple. To find me, you’ll need to look on pages _____, _____ or ______. My wood is NOT used for maple syrup. I could be the __________________________ or the ___________________________.

My height can be as high as 100 feet. I am a

3. Turn to pages 16 and 17. My scientific name is Populus tremuloides. I am a

4. Turn to page 37. Draw a picture of this leaf. Label the drawing.

What months do my flowers appear?

_________________ and _____________

What month does my fruit ripen?
5. Go to page 57. Read the 3rd paragraph about "How to Prevent Forest Fires." There is a list of 5 things you must NOT do. Write the number of the law that each person or group of people is remembering to follow.

Law #

a. Mr. and Mrs. McKean and Benn and Adam get permission to cut down their Christmas tree from the forest.  
   ________

b. Chaz is on a hiking trip in the winter. He has a PERMIT TO BURN wood in the forest so that he can stay warm.  
   ________

c. Mr. Miller remembers to pour water on his fire before he leaves his campsite.  
   ________

d. Taylor and Jenna's campfire is built in a ring of rocks so that the fire will NOT SPREAD.  
   ________

6. Read about the slippery Elm on page ________.

Read about the RANGE to find these facts:

   The slippery Elm is rarely found in the ________________ portion of the state.

   The slippery Elm is usually found
   a. in the desert
   b. in Mr. Miller's front yard
   c. on banks of streams and hillsides
"We All Need Trees"

**Objective:** Students will examine various household products and work as a team to determine which ones are made from trees. Then, revise decisions based on a short article (listening comprehension).

**Materials:** various household products that contain tree ingredients, checklists, pencils, post-its, number cards, Tree Readings

**Vocabulary:** cellulose – is what gives trees their rigidity and support; it’s the number one ingredient in wood

**Procedures**
1. Hello!

2. Create interest: Chocolate and almonds

3. Intro activity/team guidelines: 1’s = recorders and reporters, 2’s = fair trackers, 3’s = on-trackers, 4’s = questioners
   - All must agree with what the R&I writes down. It’s okay to put a ‘?’ next to an item not everyone agrees on.

4. Activity: Each team must visit at least 5 items...

5. Read #3 Tree reading aloud to them. Point out the word cellulose. Listen for information to alter what they put down.

6. Short group discussion to revise lists...

7. Large group discussion – R&I people report their decisions. I record on the board (yes/no columns).

8. Wrap-up/assessment – Do students realize that all the products come from trees in some way!

9. Homework – Take home a chocolate and Tree article to share and discuss with a parent.
Lyrics:

Verse 1
Look down from an airplane, I'll tell you what you'll see.
From Madison to Menasha, Marinette to Menomonie
The great state of Wisconsin filled with trees.

Chorus
The forest is a place for you and me
From the little bitty willow to the bur oak tree.
From the city to the country it will grow and give
The forest is the place where we all live.
The forest is the place where we all live.

Verse 2
It gives us boards and paper, it gives us shade and heat.
Makes oxygen for us to breathe and maple syrup sweet.
A place to climb and dream and swing our feet.

Chorus

Verse 3
Home for hawks and badgers, home for deer and owls.
Hear woodpeckers tapping, and the black bear when it growls.
Listen as the distant wolf pack howls.

(Musical Interlude)

Verse 4
100 years before us, the pines had fallen fast.
Stumps decaying, wildfires raging through the piles of slash.
We have learned some lessons from the past.

Verse 5
We'll plant trees where we need them and manage them with care.
Let the woods reseed itself, as it does everywhere.
A greener world for everyone to share.

Chorus
Tree Identification Unit Resources

-Teacher resources-

AIMS Education Foundation – *The Budding Botanist*
http://www.aimsedu.org/aims_store/The-Budding-Botanist-p-875.html

Full Option Science System (FOSS) – *Ideas and Inventions*
FOSS Project - Lawrence Hall of Science – University of California
Berkeley, CA 94720
Phone: 510-642-8941

National Wildlife Federation
*Ranger Rick’s Nature Scope – Trees are Terrific*

American Forest Foundation
Contact: Wisconsin Project Learning Tree
Wisconsin Department of Natural Resources

The Wisconsin Center for Environmental Education Resource Directory
College of Natural Resources
University of Wisconsin – Stevens Point
Stevens Point, WI 54481

University of Wisconsin – Madison Arboretum – *My Nature Journal*
info@uwarboretum.org
Tel: (608) 263-7888 , Fax: (608) 262-5209
1207 Seminole Highway
Madison, WI 53711-3726

Wisconsin Department of Natural Resources
*Forest Trees of Wisconsin* – tree identification handbook

-Websites-

Wisconsin’s K-12 Forestry Education (LEAF) – *Tree Identification*

University of Wisconsin – Stevens Point
http://www.uwsp.edu/cnr/leaf
EEK! Environmental Education for Kids

http://www.dnr.state.wi.us/eek/

-Children’s Literature-

Someday a Tree, Eve Bunting

The Big Tree, Bruce Hiscock

The Giving Tree, Shel Silverstein

The First Forest, John Gile

Trees, Leaves, and Bark (Take Along Guide), Diane Burns
Appendix C

Assessments
Pre-Assessment Example Card

Bur
Oak
Tree Identification Test

Look at the tree. Decide what kind of tree it is. Draw a line from the tree's letter to the correct tree name.

C  •  Basswood
B  •  Green Ash
D  •  American Elm
F  •  Red Oak
G  •  Sugar Maple
E  •  River Birch
A  •  Bur Oak

A = Bur Oak
B = Red Oak
C = Ash
D = Basswood
E = R. Birch
F = Elm
G = Sugar Maple
Appendix D

Map of Van Brunt School Outdoor Site
Appendix E
Student Tree Guidebooks
Tree Identification Guide

Van Brunt School Grounds

Created by 2006-2007
Van Brunt Fourth Graders

Honesee, WI
Scavenger Hunt!

On this scavenger hunt, you will be using clues to identify Van Brunt's trees.

1. Look through your group's tree guidebook.

2. Use the clues provided on each page to find the trees marked with circles on the colored map of Van Brunt's school grounds. (Hint: visit the trees on the map and look at their leaves, branches, bark, fruit, and seeds and compare them to the pictures in your guidebook.)

3. Once you think you have matched one of the trees in the guidebook to a real tree, write the letter of the tree in the circle on your map sheet.

4. Use the guidebook to fill in the name of the tree you found on the back of the map.
Names of group members: ____________________________

Van Brunt Elementary/Middle School - Horicon, Wi.

Mill St.

Front lawn and trees

Elementary School

Courtyard

Middle School Annex

Lawn and Trees

Gym

Parking Lot

Field
1. Write the names of the trees you identified in the correct blanks below.

A. 

B. 

C. 

D. 

E. 

2. Can you find any other trees that are the same as the ones you found? Put a smiley face and the letter of its match on the map where you think you found one.

3. a. Have you seen any of Van Brunt’s trees somewhere in your yard or neighborhood? 

   b. Which ones and where have you seen them?
Leaves:
They have opposite branching and palmate veins. They are 3 to 5 inches long and usually 5 lobed.
In autumn they turn bright shades of yellow, orange, and red.

Bark:
On the young trees it has light gray to brown or somewhat smooth bark.
On older trees it has grey to almost black bark.
Twigs—The twigs are smooth and reddish-brown with sharp winter buds.

This tree is found throughout the state of Wisconsin on better soils.

It's a Sugar Maple!
Appendix F

PTO Grant Application
PTO MINI-GRANT FORM

Teacher Name: Jeff McKean  Grade 4  Date 10/12

1. Please tell us what you would like to use the grant money for.

I'd like to use the grant money to create tree identification guides for Van Brunt's school grounds. Money will be used for digital reprints of photographs and binding/publishing supplies.

2. Explain how receiving this grant furthers the goals of the curriculum for the School District of Horicon.

This tree identification unit integrates reading (read alouds, science content) and writing (description and science [tree parts, life cycle, observation] - all important components of 4th grade curriculum. Giving the students a project that provides a specific published goal is very motivating to them.

3. Please tell us why you think the above would be beneficial to your classroom.

I believe students learn better when outdoor education is integrated into the curriculum. Having students learn about the trees on school grounds (gets them outside) gives them a positive feeling of knowledge/ownership of their school, as well. It also provides them with a project which encourages literacy.
Appendix G

Project Timeline
Project Timeline

June 2006 – Initial idea for project is formed.

July 2006 – Researcher attains new employment at Van Brunt School, Horicon, WI

July 2006 – Researcher tours and assesses the school outdoor site

July 2006 – Initial phone call regarding project with Van Brunt School Principal, Scott Miller

July 2006 – Approval by Van Brunt administration to proceed with project

August 2006 – Initial phone call regarding project with prospective cooperating teacher, Nancy Keller

August 2006 – Agreement by Nancy Keller to cooperate on project

August 2006 – Discussion with Van Brunt computer teacher, Linda Southworth regarding use of the computer lab for activities during the tree unit

August 2006 – Planning of tree unit

September 5, 2006 – Researcher’s class participates in an outdoor scavenger hunt

September 6, 2006 – Outdoor Tree identification pre-test given to both classes of fourth graders

September 7, 2006 – Tree identification unit commences for experimental class.

October 6, 2006 – Tree identification unit concludes for experimental class.

October 9, 2006 – Both classes tour Horicon Marsh via a pontoon boat

October 9, 2006 – Tree identification unit begins for control class.


October 16, 2006 – Experimental class goes outside for writing activity

October 24, 2006 – Experimental class goes outside for an outdoor site hike/activity

October 30, 2006 – Experimental class goes outside for a tree song activity

November 6, 2006 – Experimental class goes outside for a read aloud

November 8, 2006 – Tree identification unit ends for control class.

November 9, 2006 – Outdoor Tree identification post-test given to both classes of fourth graders

November 14, 2006 – Notified of winning PTO mini-grant by Katie Schmidt, PTO president.

November 2006 – Result of the post-test calculated

January 2007 – Student created tree guide pages bound.
Appendix H

Student work samples
1. Pick a leaf and do a detailed observation. Draw and add color.

2. Describe the properties of your leaf:
   - Shape: round
   - Texture: bumpy
   - Length: 8 cm
   - Area: 109
   - Prickly
   - Color: greenish-brownish
   - Size: palmate
   - Width: 7 cm
   - Veins: palmate

3. Describe your leaf so someone else can identify it: It has a round shape. It's color is a greenish-brownish. The texture is bumpy and prickly. It's size is my palm size. It's length is 8 cm. It's width is 7 cm. The veins are palmate. The area is 109 squares.
### Observe a Tree!

<table>
<thead>
<tr>
<th><strong>Tell at least 5 things you notice about your tree (when you lay under it):</strong> (leaves, trunk, berries, evidence of animal life, sounds, appearance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>trunk, leaves, seeds, bare branches, moss</td>
</tr>
</tbody>
</table>

**Start at the trunk and walk 30 steps away from your tree. Sit down and tell at least 5 things you notice about your tree from this new spot:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>looks smaller, bare branches, bunch of leaves, thinner trunk, taller trunk</td>
</tr>
</tbody>
</table>

**Tell at least 5 effects on our school, the area, the animals, and anything or anyone else if your tree was cut down tomorrow:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>no shade, less oxygen, nothing to look at, less beauty, no life</td>
</tr>
</tbody>
</table>

**Tell your feelings about your tree:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>happy, relaxed, special, it's my tree, I hope my tree will be strong, healthy, and tall.</td>
</tr>
</tbody>
</table>

**Tell the tree what you hope for it in the future:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy, relaxed, special, it's my tree, I hope my tree will be strong, healthy, and tall.</td>
</tr>
</tbody>
</table>

---

*Name: Seth*
My Tree in Summer
Dear Group, you have to look at the bark and at the leaves. Then you have to look if the branches were alternate or opposite. The you would see what color the bark and is the bark paper-like. The have to see if the leaves have or not have lobes.

Peter: I think your idea will work.

Seth: I think you’re right about everything you wrote. Tell what you should be looking for while you’re looking at the leaf. You did good, would you look at if the leaf was palmate, pinnate, or pinnatifid. You could also look at the veins to.
Dear reader,

First, you look at the leaf. Is it broad or not broad? Then you look at bark. Is it papery or not? Next, you look at the branches. Is it alternately or opposite? Finally, look and see if the leaves are compound or simple. And if you have a hand lens, you should identify it. It is fuzzy or not. I disagree because you can put it in a hand lens. I think your tree is very interesting. I think that is cool.
Dear Group,

Nate job, some a way to identify a tree explaining some of identification, if they are palmate or parallel. You can tell by looking at the bark. You can look at the twigs if they are opposite or alternate. The bark can be white or brown colored and some green can be in the bark. There also be paper-like bark and if leaves have loops or not. But the rest of Dakota's stuff is right. Seth I agree with what you wrote. You should tell more about the leaves. You should also tell about the