Outdoor Classroom Impact Study
Julie Scott, Sand Lake Elementary School, Sand Lake Michigan

**Target Grade:** 5th Grade

**Essential Questions:** What impact will the use of the school outdoor classroom have on the organisms in the ecosystem? Can humans minimize the impact and implement plans to improve ecosystems?

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Objective</th>
<th>Materials</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identifying Our Outdoor Classroom</td>
<td>TWL define the boarders of the outdoor classroom ecosystem and measure its boundaries.</td>
<td>Journals, Pencils, Color Pencils, Stakes, Measuring Tapes</td>
</tr>
<tr>
<td>2</td>
<td>Identifying Plants and Trees in the Outdoor Classroom</td>
<td>TLW design a way to collect vegetative data for an in-depth nature study of the outdoor classroom ecosystem &amp; implement plan.</td>
<td>Picture Cards, Journals, Pencils, Color Pencils, Field Guides, Blog/Computer</td>
</tr>
<tr>
<td>3</td>
<td>Identifying Insects in the Outdoor Classroom</td>
<td>TLW design a way to collect insect data for an in-depth nature study of the outdoor classroom ecosystem &amp; implement plan.</td>
<td>Picture Cards, Journals, Pencils, Color Pencils, Field Guides, Blog/Computer</td>
</tr>
<tr>
<td>4</td>
<td>Identifying Larger Animals in the Outdoor Classroom</td>
<td>TLW design a way to collect larger animal data for an in-depth nature study of the outdoor classroom ecosystem &amp; implement plan.</td>
<td>Journals, Pencils, Color Pencils, Field Guides, Blog/Computer</td>
</tr>
<tr>
<td>5</td>
<td>Collecting and Keeping Data Over the Course of the Year</td>
<td>TLW design a way to continue to collect outdoor classroom data throughout the year and interpret when study is complete.</td>
<td>Journals, Pencils, Color Pencils, Field Guides, Blog/Computer</td>
</tr>
<tr>
<td>6</td>
<td>Interpreting Data and Making Plans to Maintain or Improve Ecosystem</td>
<td>TLW interpret data collected and make recommendation for future management of the outdoor classroom.</td>
<td>Journals, Pencils, Color Pencils, Field Guides, Blog/Computer, Other Items TBD</td>
</tr>
</tbody>
</table>
Unit Overview

These lessons provide the opportunity for students to study the effects of human impact on ecosystems by identifying and journaling the life found in the outdoor classroom and then watching it throughout the year. Students will learn how scientists identify, collect and maintain samples in the field. The lesson plan is inquiry in design, allowing the children to define how and what information is collected. There is also room for flexibility, allowing students to further investigate topics that they find interesting, or instructors to break for “teachable moments”. Students utilize technology by using a digital camera to record what they are seeing and creating a field guide blog of the outdoor classroom so they may share their findings to the outside community. The unit culminates with students assessing the data collected to determine the human impact on the classroom and creating an outdoor classroom management plan. Students are given time to put the first phase of their management plan into action. In the end, students write a letter inviting future students to pick up observation and management where they left off.

The Outdoor Classroom Defined

This set of lessons require students to identify a plot to create an outdoor classroom. The classroom can be on the school grounds or off. It is essential that students are able to access the site with some regularity. It is also ideal if other classes are accessing the site to use for their activities. The plot for your outdoor classroom could be as simple as a fence row or as extensive as a forest.

FORBES Top Ten Blog Publishers

This unit utilizes technology by allowing students to publish the happenings of the outdoor classroom and share their results with the community. Depending on the time allotted and the skill of the participants, you could do individual blogs or one large class blog that is teacher managed. Below is a listing of the Forbes top 10 blog publishers. I personally have used Blogger with good results as it is free, free of ads, and you are able to control who views/uses the publication. For a review of the list, please visit: http://www.forbes.com/bow/b2c/category.jhtml?id=311

<table>
<thead>
<tr>
<th>BLOG</th>
<th>SITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WordPress</td>
<td><a href="http://www.wordpress.org">www.wordpress.org</a></td>
</tr>
<tr>
<td>Blogger</td>
<td><a href="http://www.blogger.com">www.blogger.com</a></td>
</tr>
<tr>
<td>Blogsome</td>
<td>blogsome.com</td>
</tr>
<tr>
<td>Moveable Type</td>
<td><a href="http://www.movabletype.org">www.movabletype.org</a></td>
</tr>
<tr>
<td>Textpattern</td>
<td>textpattern.com</td>
</tr>
<tr>
<td>B2evolution</td>
<td>b2evolution.net</td>
</tr>
<tr>
<td>LiveJournal</td>
<td>livejournal.com</td>
</tr>
<tr>
<td>MSN Spaces</td>
<td>spaces.msn.com</td>
</tr>
<tr>
<td>Squarespace</td>
<td>squarespace.com</td>
</tr>
<tr>
<td>TypePad</td>
<td><a href="http://www.typepad.com">www.typepad.com</a></td>
</tr>
<tr>
<td>Yahoo 360</td>
<td>360.yahoo.com</td>
</tr>
</tbody>
</table>

Outdoor Classroom Impact Study
### Additional Teaching Resources

<table>
<thead>
<tr>
<th>Title</th>
<th>Media Type</th>
<th>ISBN/ISSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Teacher</td>
<td>Periodical</td>
<td>ISSN: 1192-1285</td>
</tr>
<tr>
<td>Last Child in the Woods: Saving our Children from Nature Deficit Disorder</td>
<td>Book</td>
<td>ISBN: 978-1565126053</td>
</tr>
</tbody>
</table>

### Recommended Regional Identification Resources

<table>
<thead>
<tr>
<th>Title</th>
<th>Media</th>
<th>Author</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insects of the North Woods</td>
<td>Book</td>
<td>Jeffery Hahn</td>
<td>ISBN:978-0-9792006-4-9</td>
</tr>
<tr>
<td>Amphibians and Reptiles of the North Woods</td>
<td>Book</td>
<td>Allen Blake Sheldon</td>
<td>ISBN:978-0-9673793-8-8</td>
</tr>
<tr>
<td>Dragonflies of the North Woods</td>
<td>Book</td>
<td>Kurt Mead</td>
<td>ISBN:978-0-9792006-5-6</td>
</tr>
</tbody>
</table>

Outdoor Classroom Impact Study
Digital Camera

As part of this unit, I will be writing a grant asking for digital cameras so that we will be able to record our findings and post them to an electronic field guide in the form of a blog. Below is information regarding the specific model I am asking for: Kodak Easyshare M530. This particular camera offers many features that a first time, 5th grade user would have success with. This is easy-to-use point-and-click model that has a re-chargeable battery built in.


Assessment Philosophy

The journal entries and final project will be graded on an A or I scale. To receive an A, the student needs to complete the assigned task and requirements. A student who does not complete the required task receives an I, or Incomplete, until the task is finished. When the I student completes the task to satisfaction, they receive an A. Students are not given credit for levels of incompleteness. A rubric, categorizing incompleteness, isn’t used. Re-teaching time is essential and built into an A or I scale classroom. If a student is missing an element, the teacher helps the student achieve it. Students are not allowed to “almost succeed” somewhere in between with levels of B, C, or D; instead, plans are put into place to support a student who is not able to finish the requirement within the time given. This grading procedure is consistent with the standards based report card given in elementary school which asks to report if student can do a task or not.

Picture Cards

Picture cards are an important part of my classroom as I often use them as a sorting activities. 5th graders are working on classifying, and it is important for them to start observing closely and classifying in a way scientists do. The uses for a set of picture cards are endless.

My picture cards are a set that my class made for me a few years ago and I use them for a multitude of tasks. These are particular pictures of various organisms that we cut from old National Geographics, put on tag board and laminated.

Pacing

This unit is intended to begin in September and continue through until the end of the school year. Many of the individual lessons will take several days to complete because they involve observation, identification, and blogging the field guide. As part of long-term observation, many of the basic data collection techniques will be repeated throughout the year. Hopefully, students will refine their scientific skills as they repeat the basic outline of the lesson of observing, identifying, and recording. Because this unit is inquiry driven, many lessons or “teachable” moments will occur outside of the stated objectives and may take more time to explore.

5th Grade Michigan Grade Level Content Expectations

L.EV.05.11 Species Adaptation and Survival:  Species with certain traits are more likely than others to survive and have offspring in particular environments. When an environment changes, the advantage or disadvantage of the species’ characteristics can change. Extinction of a species occurs when the environment changes and the characteristics of a species are insufficient to allow survival.

L.EV.M.2 Relationships Among Organisms:  Similarities among organisms are found in anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance.

Outdoor Classroom Impact Study
IDENTIFYING OUR OUTDOOR CLASSROOM
LESSON ONE

Objectives
TLW define the boarders of the outdoor classroom ecosystem and measure its boundaries.

Engage
• Working together in groups of 2 ask students to answer the question:
  • AN ECOSYSTEM IS...
• Ask students to share their answers and record responses on the board.
• Ask students to copy the class definition of Ecosystem into their journal.
• Explain to students that we are going to study an ecosystem in depth.

Lesson
• Take students to plot of land that has been allocated to study.
• Engage Students in a discussion about the boundaries of the outdoor classroom:
  • Today we are going to plot out our outdoor classroom and study the ecosystem it contains.
  • We need to decide how big the plot should be so we can collect data about who lives here.
    • How long will it be?
    • How wide should it be?
    • What kinds of things live here?
    • Will proposed boundaries be big enough or too big?
• After discussion, vote on the boundaries.
• Once boundaries are defined, provide teams with steaks to mark the boundaries.
• As a large group discuss the features of the classroom
  • Do you have hills, water, fence rows?
  • Canopy and Understory elements?
  • Define elements in the outdoor classroom that are inorganic: rocks, buildings, etc.
• Breaking into small groups provide each group with measuring equipment and ask them to measure the perimeter of the classroom.

Journal
• Have students sketch what the classroom looks like, providing the measurements and inorganic features. For now, organic elements do not need to be included specifically. Students can mark organic elements broadly; for example, tree, grass.

Closure
• Ask groups to join each other and share their journal measurements and drawings with one another.
  • Are measurements correct or do you need to look again?
  • Did you see a sketch you really like? What do you like about it?
  • Is it important to be accurate in measurements and drawings? Why?
• Share closure questions with group.

Assess
• Collect journals and check perimeter details for accuracy and completeness. If parts are incomplete or not finished, allow student time to complete the task. If students have mistakes, re-teach. Grade on an A or I scale.

Outdoor Classroom Impact Study
Identifying Plants and Trees in the Outdoor Classroom

Lesson 2

Objective
TLW design a way to collect vegetative data for an in-depth nature study of outdoor classroom ecosystem & implement plan.

Engage
• When students enter the room, give each child a picture card. Picture cards have various plants and animals on them.
• On the board draw 2 columns: PRODUCERS / CONSUMERS
• Ask students to place the cards into the correct category.
• Discuss findings and then create a class definition for each word.
• Ask students to copy the class definition for Producer and Consumer into their journal and provide a picture for each.
• Explain to students that we are going to study the producers in classroom today.

Lesson
• Take students to plot of land that has been allocated to study.
• Model how a scientist collects plant data.
  • Explain that we are not going to disturb the plants in our classroom. Be careful not to tromp!
  • Show students how to photograph plants and trees by choosing a specimen to study.
  • Once photo is obtained, try to identify it using field guide.
    • Explain how field guides are used and show them the features of the different guides.
    • Talk about leaf types and other identifiers that will help them to identify the plants.
  • Show them how to record data in a table by recording picture # and identification.
• Now it is time to release the student teams to do the same.
  • Assign each student team a section of the classroom to plot, recording plants in their plots by taking pictures and identifying. Remind them to also do any trees in their sections.

Journal
• As students are collecting samples, they are to create a way to keep track of data.
• Here are the data points--Picture Number, Species (if they can figure it out with the field guides).

Closure
• As a whole group, share the various ways that students recorded data and discuss the pros and cons.
• As a group, Correlate the individual data into one cohesive group data table.

Blog
• Students are publishing an outdoor classroom field guide as a blog.
• Ask students to download their pictures and species identification onto the blog.

Assess
• Collect journals and correct for accuracy and breadth.
• Check blog to see if it corresponds to journal entry.

Extension
• Did students collect things that are sometimes confused for plants, like mushrooms, fungus, or lichen? This is a perfect time to discuss how these things are different. Students who are ready for more, may work on collecting data on these kingdoms.
Identifying Insects in the Outdoor Classroom
Lesson 3

Objective
TLW design a way to collect insect data for an in depth nature study of outdoor classroom ecosystem & implement plan.

Engage
• Distribute picture cards of different insects to the classroom and ask them to define what an INSECT is by looking at the various cards.
• When they are finished, write the various definitions on the board and look for similarities. You should see things start to emerge, you may also point out how some insects have wings, and some do not, and so on.
• After looking at all the definitions, come up with an agreed upon classroom definition.
• Ask students to copy the class definition of INSECT into their journal and provide a picture for each.
• Explain to students that we are going to study the insects in outdoor classroom today.

Lesson
• Take students to plot of land that has been allocated to study.
• Model how a scientist collects plant data.
  • Explain that we are not going to disturb the insects in our classroom; if rocks are rolled, gently put them back into place before you leave.
  • Show students how to photograph insects by choosing a specimen to study.
  • Once photo is obtained, try to identify it using field guide.
    • Talk about identifiers and explain that this is a huge classification, we might not be able to classify the specimen with 100% accuracy.
  • Show them how to record data in a table by recording picture # and identification into journal.
• Now it is time to release the student teams to do the same.
  • Assign each student team a section of the classroom to plot, recording insects in their plots by taking pictures and identifying.

Journal
• As students are collecting samples, they are to create a way to keep track of data.
• Here are the data points--Picture Number, Species (if they can figure it out with the field guides).

Closure
• As a whole group, share the various ways that students recorded data and discuss the pros and cons.
  • Remind students that not all sightings are of separate insects; for example, the same flying insect might be seen and reported by several groups. How will that affect your data?
• As a group, Correlate the individual data into one cohesive group data table.

Blog
• Students are publishing a outdoor classroom field guide as a blog.
• Ask students to download their pictures and species identification onto the blog.

Assess
• Collect journals and correct for accuracy and breadth.
• Check blog to see if it corresponds to journal entry.

Extension
• Did students collect things that are sometimes confused for insects like slugs and snails? This is a perfect time to discuss how these things are different. Students who are ready for more, may work on collecting data on these organisms.
Identifying Larger Animals in the Outdoor Classroom
Lesson 4

Objective
TLW design a way to collect larger animal data, such as frogs, salamanders, snakes, birds, mammals for an in depth nature study of outdoor classroom ecosystem & implement plan.

Engage
• Explain to students that we are going to continue studying consumers by taking a close look at large animals in outdoor classroom today.
• Ask students to make a prediction as to what types of animals we will see in the classroom.
• Write the predictions on sticky notes to share with the class.
• Post the predictions and discuss.
  • Which ones are possible?
  • Which ones are probable?

Lesson
• Take students to plot of land that has been allocated to study.
• Model how a scientist collects animal data.
  • Explain that we are not going to disturb the animals in our classroom.
  • Show students how to photograph animals by choosing a specimen to study.
  • Once photo is obtained, try to identify it using field guide.
    • Talk about identifiers and explain that we might not be able to classify the specimen with 100% accuracy.
  • Show them how to record data in a table by recording picture # and identification into journal.
• Now it is time to release the student teams to do the same.
  • Assign each student team a section of the classroom to plot, recording animals in their plots by taking pictures and identifying.

Journal
• As students are collecting samples, they are to create a way to keep track of data.
• Here are the data points--Picture Number, Species (if they can figure it out with the field guides).

Closure
• As a group, Correlate the individual data into one cohesive group data table.
  • As with the insects, not all sightings are of separate animals; for example, the same bird might be seen by several groups.
• Discuss whether or not the class predictions given in “engage” were correct.
• Discuss if animals use the classroom that we might not have seen today.
  • Lead students in a discussion about scats and tracks.
  • Lead students in a discussion speculating where these animals might go during the day.

Blog
• Students are publishing a outdoor classroom field guide as a blog.
• Ask students to download their pictures and species identification onto the blog.

Assess
• Collect journals and correct for accuracy and breadth.
• Check blog to see if it corresponds to journal entry.

Extension
• Students who are “finished” can look for the evidence of animals: scats, tracks, etc.
Collecting and Keeping Data Over the Course of the Year
Lesson 5 (Throughout the Year)

Objective
TLW design a way to continue to collect outdoor classroom data throughout the year and interpret data when study is complete.

Engage
• When students enter the room, ask them to draw a picture of what they believe their outdoor classroom will look like in January.
• When students are finished, share the changes together.
• Have students choose one organism that they observed from their journal, and ask them to report what changes that the organism is likely to go through in the coming months.
• In small groups have students share their organism and the likely changes.

Lesson
• Explain to the students that we are going to be collecting data on the organisms in our classroom throughout the year and recording the changes.
• Discuss some of the changes that the students predicted from the “engage” that would occur.
  • Do we think we might see new things? Why...discuss migration, birth, seedlings, perennials, etc.
• Talk about how to collect the data throughout the year and use a calendar to make a plan.
  • Students can make a plan individually, and then come together to discuss how to make it something we can stick to throughout the year.
• Formalize the plan by making an scientific observation calendar with planned observation dates.
• When you go to do observations throughout the year:
  • Look for new specimens.
  • Record changes in old specimens.
  • Look for declining populations, is someone gone or going. Where did they go?
  • Are humans changing the ecosystem or are the changes natural?
    • Record human activity that is taking place.
• Discuss the changes with the class as they go.
• Follow the plan throughout the year.

Journal
• Students continue to collect pictures and identify samples in the format they chose.
• Students can also journal what the classroom as a whole looks like throughout the year by drawing or taking pictures.

Blog
• Update the blog by continuing to download pictures and identifying species throughout the year.
  • For blog update, and for organizational purposes, diary form may work best. Students time stamp the entry then download the pictures and species identification.

Closure
• As a follow-up question, challenge students to think like real scientists. Have them predict problems with the observation plan and think of ways to solve problems before they occur. Have them journal their thoughts.
  • This closure might take a lot of time, but it is important for kids to start learning how to foresee problems and try to solve them before they occur.
  • This closure will require some discussion the next day and might require some application to the existing plan. You might even want to allow some time for brainstorming to take place if students were not able to do this on their own. Teacher may have to model.

Outdoor Classroom Impact Study
Interpreting Data and Making Plans to Maintain or Improve Ecosystem
Lesson 6 (End of Year)

Objective
TLW interpret data collected and make recommendations for future management of the outdoor classroom.

Engage
• Have students respond to the journal prompt: Do you think that human activity can change an ecosystem? Explain and give examples.
• Discuss the journal responses.

Lesson
• Ask students to look over the blog and make a master list of all the organisms in the outdoor classroom.
  • Explain to students that one easy way to organize the list is by plants, trees, insects, birds, animals.
  • Once the list is prepared (this might take some time), go over any observations made as to the health of the population.
  • Go over journal entries and discuss impacts of human activity on the outdoor classroom ecosystem.
  • Were human activities changing the population?
• What kinds of things can we, as humans, do to help natural ecosystems?
  • Make a list on the board: remove trash, don’t let invasive species in, leave things intact, etc.
  • From the list, have the class choose some things that we could do specifically to improve the health of our ecosystem and highlight them.
  • Allow kids to work in teams to think of and create a plan to manage and improve the ecosystem.
  • What are the needs of the outdoor space?
  • How can both humans and other organisms share this space?
  • What resources do we need to improve the ecosystem?
  • How much time can we spend doing this?
  • Will we need help or money?
  • Is this something we can really do?
• Explain to kids that big ideas are born from little ones. In order to improve an area, a plan is usually needed. It is often hard to do everything at once. People often complete plans through phases which are logically stepped plans of action.
  • Look over the plans with kids.
  • Could we agree on a phase-one?
  • Perhaps phase-one could be installing a birdhouse or a assembling a team to remove litter?
  • Formalize the plan by writing out phase one.
    • The teacher could decide that phase-one is something the entire class could do or...
    • maybe there are several small phase-one components that could be done by small groups.
  • Implement the plan

Journal
• Write out phase one of the management plan. Be sure to include the goal and the specifics of how you implemented the plan.
  • Because this project takes several days, you may want to split this journal entry into smaller components.

Closure
• Celebrate the fruits of your labor by enjoying your outdoor classroom--journaling, reading, whatever you would like to do. Make sure your activities do not hinder the organisms that call this place home. Maybe you just want to be still and watch what happens!
Assessment
• This assessment is a way to link prior learners to future learners and keep the project going for multiple classes. It invites students to take ownership of the classroom and pass that ownership on to future students.
• Give the following assignment and make a checklist for the board:
  • Write a letter to future students:
    • Tell them what the outdoor classroom is.
    • Tell them a little about what kinds of producers and consumers live there.
    • Include a picture of your favorite organism in the classroom
      • and make sure you identify it.
      • tell them why this particular organism is a favorite; does it do something special?
    • Invite them to check out what else live here by reading our blog.
    • Suggest that they can add to the blog if they find something new!
    • tell them what you did to improve the outdoor classroom.
      • why you did it.
      • what you hoped would happen when you did it.
    • Is there a way that they, as future 5th graders, can help preserve the classroom as a place that both students and wildlife can use?
      • Tell them how.
    • Is there anything you want them to keep an eye on?
      • Tell them what you want them to watch for!
      • Is there something you are concerned about, tell them about it!
    • You helped to create this, now encourage future students to preserve it!
• Collect letters and correct for depth and breadth, making sure they answered all the key questions.
• Students must submit a clean, mistake free copy to give to future students.
• Grade on A or I scale. If needed, re-teach needed elements in small groups. For students with exceptionalities, video versions of the letter can be created.