BioBlitz Field Study & Research

This is a working document; feel free to contact Kelly Vorron, Rahr Memorial School Forest coordinator for the most updated version of this plan.

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Sixth Grade Camp

Rahr Memorial School Forest

Manitowoc Public School District

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" … an area ought to be provided for study, experimentation, and research, an area which is available during all of the years of a child's school career."

~ Eugene Krejcarek, 1998

Core Idea

Scientific Principles

*Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.

*Organisms, and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving factors.

Overarching Questions

How does a system of living and non-living things operate to meet the needs of the organisms in the ecosystem?

Is your study site at the School Forest diverse?

How can diversity help make an ecosystem healthy?

TEACHER PREPARATIONS:

- Read this lesson plan.
- Each school will have the pre-lesson box for at least 3 days. Combination: 12-30-24
    - It should arrive by Tuesday morning the week before you go to camp.
    - You will have the kit for all of Tuesday, Wednesday, and Thursday.
- Divide the class into 4 teams, and if more than 1 class is going to the forest at a time, divide the group into 8 teams TOTAL.
- Share student data sheets with students through google docs. School Forest Coordinator will send you the data sheets to share. Student computers can either be brought to the School Forest or data entered after you return to school after camp. Paper copies of the data sheet will be at the forest for students to record data in the field.
- Teach pre-lessons. Pre-lesson data sheets will be sent to you prior to the start of your pre-lesson week from the School Forest Coordinator.
- Send the material box to the next school in the Friday morning delivery.
    - ***(please put in delivery Thursday afternoon before you leave)***
- Materials needed for Monday and Friday will be provided to you ahead of time by the School Forest Coordinator.

NEXT GENERATION SCIENCE STANDARDS:

MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. ***(Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.)***

- Analyze and interpret data to provide evidence for phenomena.

MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. ***(Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.)***

- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.

ENGLISH LANGUAGE ARTS COMMON CORE STATE STANDARDS:

RI6.7: Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

W6.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.6.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

W.6.6: Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others.

W.6.7: Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

W.6.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

RST.6-8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

WHST.6-8.1b: Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

MATERIALS:

Pre-Lesson Materials (provided by SF coordinator before camp):

- PowerPoint program
- *Young Naturalists: Counting Critters* articles- 30 copies sent to each school http://www.dnr.state.mn.us/young_naturalists/counting_critters/index.html
- "Counting Critters" vocabulary and questions sheets - copies sent to each school for all students

Pre-Lesson Box:

- 1 backpack with all of the materials (including iPad #9 and walkie-talkie #9)
- iPad charging cord
- Walkie-talkie
- Walkie-talkie charger
- *Young naturalists: Look down in the woods* article (10 copies)
- *Young naturalists: Ready Set Grow* article (10 copies)
- *Young naturalists: Beetlemania* article (10 copies)
- *Young naturalists: Awesome Opossums* article (10 copies)
- *Young naturalists: Slinky, stinky Weasel Family* article (10 copies)
- *Young naturalists: Natures Recyclers* article (10 copies)
- *Young naturalists: Nature's Calendar* article (10 copies)
- *Young naturalists: Wild Ideas* article (10 copies)
- *Young naturalists: The hole story* article (10 copies)
- *Young Naturalists: Tremendously Marvelous Trees* article (10 copies)
- *Young Naturalists: Let's Go Birding* article (10 copies)
- *Young Naturalists: Six Slippery Salamanders* article (10 copies)
- *Young Naturalists: Lichens: Two Lives In One* article (10 copies)
- *Young Naturalists: The Greatest of Feet* article (10 copies) *Young Naturalists: Ubiquitous Conifers* article (10 copies)
- Tree cookies - one small, one large
- Track mold
- Timer
- Field guides

School Forest:

- 8 Backpacks with all the materials listed on the checkout sheet
- Backpack sign out sheets (8 per camp)
- Clipboards
- Power strip
- Data sheet print outs (if needed)
- 8 iPads (in locked cabinet)
- iPad charging cords (8)
- iPad connector for LCD projector
- LCD projector
- Walkie-talkie for teacher (2)
- Walkie-talkie chargers (5)
- Teacher map
- Student maps

Post-Lesson:

- Group data from the school forest
- Group photos from the school forest
- Internet access
- Field Guides

PRE-LESSONS

The purpose of the pre-lesson is to introduce the project, its importance and familiarize the students with the materials they will be using at the School Forest.

Depending on your situation and the time you are able to devote, there are two possible scenarios on how to cover the information:

A.) Approximately 3 hours over the course of 3 days.

a. Tuesday: Introductory PowerPoint presentation (20 minutes) – Use the accompanying slideshow notes to talk through the presentation. This will introduce the project and encourage excitement in the research the students will complete at the School Forest.

b. Tuesday, Wednesday, Thursday: Train on all of the jobs (160 minutes). See station descriptions below in 45 minute lay out. While at the School Forest, the students will work in research teams. Each team will be assigned a piece of land to study. During sixth grade camp, the students will go to their study site each day to work. We will not have time at the School Forest to learn the different tasks that need to be completed. In the classroom, set up the seven stations and have students rotate around the room to complete their worksheets and learn how to use the equipment. In this format, students will have about 20 minutes per station. You may have to stop a station early and restart it the next day, allowing students to complete the 20 minutes.

c. Evening Assignment: Have students pick specialties: Wildlife Biologist: Big animals (2 students), Wildlife Biologist: Small Animals (2 students), Botanist/Mycologist (2 students), Forester (2 students) If more than 8 students per group, assign more per specialty group. Assign each member of a research team a supporting article to read that evening. This is meant to help familiarize the team members with some of the species they may encounter at their study site, while creating "specialists" within each team.

B.) One-week science (45 min/day) mini-topic study.

Monday: Watch the Introductory PowerPoint presentation and have a discussion. Assign the article *"Counting Critters,"* by Bob and Jan Welsh, to help the students understand the *why* behind this project and how the information will be used. After handing the article out, make sure to go over the vocabulary the students will

encounter. Have the students write a summary of the article to show their understanding of wildlife research projects.

Tuesday, Wednesday & Thursday: Introduce each of the stations and give a brief run-down of what the students need to complete at each. Have each research group work through the stations to gain a good understanding of the field guides and how to use the materials. Students will have about 18 minutes per station. You will have to cut off stations and restart them next day.

Stations:

- Naturalist: Practice writing a site description. Review Poison Ivy and Stinging Nettle Cards
- Technology: Practice with their data sheet, ipad and walkie talkies.
- Wildlife Biologist Big Critters: Look at the track mold, photos, and use the field guides for identification.
- Wildlife Biologist Small Critters: Use field guides to learn about amphibians, insects and other small critters the students may encounter.
- Botanist (plants) : Use the field guides to identify photos provided and answer questions.
- Mycologist (fungus & lichens): Use the field guides to identify the provided photos and answer questions.
- Forester (trees): Learn how to use a dichotomous key for trees, identify photos of trees, and practice measuring trees.

Wednesday Night Assignment: Have students pick specialties: Wildlife Biologist: Big animals (2 students), Wildlife Biologist: Small Animals (2 students), Botanist/Mycologist (2 students), Forester (2 students) If more than 8 students per group, assign more per specialty group. Assign each member of a research team a supporting article to read that evening. This is meant to help familiarize the team members with some of the species they may encounter at their study site, while creating "specialists" within each team.

Friday: Project the image of the pond onto your whiteboard. Have the kids look at the picture through the eyes of a scientist and write a descriptive paragraph about it. Remind them that the primary purpose of descriptive writing is to describe this place in such a way that a picture is formed in the reader's mind. This involves paying close attention to the details by using all of the five senses and including; landscape features (rocks, sand, hills, water features) and vegetation (trees, grasses, bushes). Lead a class discussion about aspects of the scene that scientists would highlight and emphasize.

Then have all the students write the paragraph like a scientist would. After collecting these, choose a few to project and talk about, focusing on those that really do a great job at describing the scene. Remind them that at the forest each group will need to write a really good description of their site.

C.) If you have time you could also:

1.) Go outside at school – take the tree field guides and pick a few trees in the school yard to identify and measure (this will really help the students when they get to the School Forest).

2.) Descriptive writing – bring in leaves (rocks, shoes, something) and describe, play game where the students each describe similar items and then the objects are all placed out and the class reads the descriptions and tries to match them with the correct item

FIELD STUDY AT CAMP

Student responsibilities (6-9 students per group):
Have students pick specialties: Wildlife Biologist: Big animals (2 students), Wildlife Biologist: Small Animals (2 students), Botanist/Mycologist (2 students), Forester (2 students)

If more than 8 students per group, assign more per specialty group.

Preparations (day 1)

Goals for Day 1:

- check out equipment
- find sites
- measure radius of plot and hang small flags around to make the circle
- site descriptions
- start data collection

MAP READING – Look over maps of the School Forest with class. Point out the north arrow. Talk about the different trails and where the buildings are located. Then point out where each group's station will be. There are 16 stations. The stations are in different areas of the forest. Each group will have their own plot to study for the 3 days (they go to the same place each day). The teacher may decide to put groups in areas close to each other. Use the map to determine where you would like each group to go.

PLOTS – Each plot has a center post with the number of the site on it. Plots are in a variety of habitats at the School Forest.

SIGN OUT BACKPACKS – Groups should use the same backpack (and iPad) each day. There are 8 backpacks for use at the School Forest. Go through the "check out" checklist with the students and sign off. If anything is broken or missing, make a note of it on their check out paper.

- When putting the backpacks and iPads together to hand out, make sure to coordinate the same numbers together (backpack #4, iPad #4).
- Each backpack & iPad should only be used and assigned to one study group. That way the photos and information will not get mixed up.

REVIEW BACKPACK CONTENTS – Discuss radius rope and hanging the flagging (just tear off a few inches of flagging for each flag, use about 6-8 flags around site).

TEST THE WALKIE-TALKIES – Each group number should correspond to the number on their backpack and walkie-talkie. Show the different buttons on the device. Leave "On" the entire time you are out in the woods. The teacher should press the "scan" button on theirs. Remind the kids that the teacher may not hear you the first time you call because they are talking to another group… in this case, just keep trying. When you call the teacher say "Group ___ calling Mrs/Mr. ___" THREE TIMES then wait for a response before you continue. Hold the button down for a second after you are done talking (otherwise your voice may get cut off). TEST WITH EACH GROUP.

Discuss the end time of class, where to meet the group, etc.

Jobs At Site:

Have students pick jobs before heading out to the site.
Day 1 jobs: Mark site (2 students), Take photos and write description (2 students), air and soil temperature and abiotic observations to be added to site description (2 students), Forest tree ID can start measuring and identifying trees (2 students)

FINDING THE SITE – The students should use the map to locate their site. Walk together to the general area and then the groups can find their post. They can also put the Latitude and Longitude in the GPS app to plug in their coordinates and locate their plot.

PHOTOGRAPH SITE -- Take photographs of each direction from your plot post (North, East, South, West). Make sure the post with the number is visible in the photographs.

GENERAL DESCRIPTION – A couple students should work on writing the description of the site; coniferous, deciduous, topography, water present, on the iPad.

SET-UP PLOT – A couple students should work on measuring out the radius (1/20 acre = radius of 26 feet 4 inches) and marking it with flags.

Make sure to gather all materials before you leave your plot.

Data collection (day 2)

BIOTIC DATA INPUT – Input data onto paper sheets to be put in google docs.

Group works together to identify, measure, and record the species within their plot. Use field guides to identify.

Photograph anything of interest to prove what you find at the site.

Wrap up (day 3)

Share plots… point out interesting observations, take down flags can go with small groups or large groups… Recommend that for the larger camps (2+ classes) that the camp schedule is set for small group rotations. For a small camp, stay together to visit sites.

Go through supplies and make sure all is accounted for.

Input data into google docs if computers were brought to the school forest.

Email pictures to one of the group members if computers were brought to the school forest. OR download photos onto teacher computer.

Post-lesson (at school):

Individually, the students will now analyze the data using the Claim – Evidence – Reasoning (CER) method of scientific explanations, to state whether or not their site was diverse.

Prior work by the students using the Claim – Evidence – Reasoning method would be very helpful, but is not necessary to produce the scientific paper.

Print and hand out *Appendix A* and *Appendix B* for your students to use.

Read through each handout with your students explaining how they will use the data they collected now to produce a scientific paper analyzing, explaining, and summarizing the results.

Use *Appendix B* as a planning sheet for writing the paper.

When typing the final paper for publication, students should then place some of the photographs and create graphs showing the information that was collected. Students should DEFINITELY include N, S, E, W photos taken at site as well as other photos taken that relate to project.

In Addition:

Each group will need to reassemble at school and go over the data they collected.

Give each group the historic photos from the sites, if they are available. Groups with the historic photos & descriptions should do a compare/contrast of the site.

Long-term:

After all of the camps are complete, the School Forest Coordinator will read through the data that the students collected. The best data for each site will be printed and saved. The photos will be added to the photo collection.

ADDITIONAL HELPFUL RESOURCES

"Claims, Evidence, and Reasoning: Demystifying data during a unit on simple machines"
http://searkscience.pbworks.com/w/file/fetch/70117336/2-Claimsevidence.pdf
This article explains how one teaching introduced this new concept to his 5th grade class, including rationale, and examples you can use in your classroom.

"Designing Science Inquiry: Claim + Evidence + Reasoning = Explanation"
http://www.edutopia.org/blog/science-inquiry-claim-evidence-reasoning-eric-brunsell
This resource contains good information and excellent videos to use when introducing the concept of Claim – Evidence – Reasoning (CER).

"Inquiry and Scientific Explanations: Helping Students Use Evidence and Reasoning"
http://primaryconnections.org.au/professional-reading/images/Inquiry-Scientific-Explanations-Helping-evidence-reasoning.pdf
This is a helpful article explaining CER, and how to use it in the classroom.

"Scaffolding for Claims, Evidence and Reasoning: An Introduction to Science Unit"
http://www.paesta.psu.edu/sites/default/files/scaffoldingforcer.pdf
This resource is a great way to start the school year by setting up the use of the Claim – Evidence – Reasoning format for scientific explanations, practicing it, and building the understanding in your students.