

## Environment, Ecology, & Nature 1<sup>st</sup> Quarter Biology Project

**Introduction:** The natural world consists of a wealth of beauty, mystery and enjoyment that can fill a lifetime of discovery and excitement for the most inquisitive of minds. Welcome to God's World. The following activities involve a direct "Hands On Study" of biology and ecology, dealing with our natural environment.

The purpose of this project is to:

- enjoy the time spent in God's World
- experience the diversity in Creation
- recognize the fragile balance in nature
- relate to work done in nature by ecologists and biologists

**Reminder:** We try to leave God's glorious world intact. We don't disturb an organism that is protected, rare, or has taken a long time to establish itself in that location.

**Directions:** Each student is required to complete one of the activities of his/her choice from the list provided below. Each activity lists the requirements for all of the things that must be turned in. Students may turn in projects before the due date.

**Materials:** Your awesome instructor may assist by directing students to resources and helping to find supplies. The student will cover all expenses.

**Style:**

- a. Provide complete and correct citations (i.e. references, bibliography) for any references or pictures used; this is likely to be needed for each activity! These must be presented according to the proper format as given in *Writer's Inc*.
- b. Neatness and quality of work is important no matter how God has blessed you. Pictures do not have to be printed in color, black and white is acceptable. All pictures should be clear, not blurry, and NOT pixelized.
- c. All organism names are to be identified with both common and scientific name (Genus and species). See pg. 486 in text for proper formatting of scientific names.
- d. All paragraphs or papers will be word-processed, double spaced, using formal language and grammar, 12-pt, Times New Roman font, 1-inch margins. Please proofread and edit this work.

**Due Date:** \_\_\_\_\_

### List of Activities

1. Visit a zoo or wildlife sanctuary.
  - a. Identify a minimum of 4 threatened/endangered animal species including both common and scientific name
  - b. Write a short profile of each (include natural habitat, biome, food, predator/prey relationships, life style, biotic/abiotic factors that may influence their life, their location in the world, etc.) Some information may need to be obtained from non-zoo sources. Minimum length is one full page per animal.
  - c. Include the reasons they are threatened/endangered and what could be done to help them
  - d. Give location, date, and persons attending
  - e. Attach program or ticket stub for verification
  - f. Draw a simple line sketch or provide a photo(s) of the enclosure for each animal. The entire enclosure and objects in it should be readily identifiable; do not just provide a close-up of the animal.

2. Owl pellets.
  - a. Purchase an owl pellet (from your instructor or perhaps at nature center gift shops)
  - b. Dissect out the indigestible remains
  - c. Neatly reconstruct, on stiff cardboard, the remains of the skeleton(s). See if you can correctly build at least one complete animal.
  - d. Write a minimum 1-page paper describing how you did the project, “**what an owl pellet is**”, how pellets are made, what kind of remains were in the pellet you had, what kinds of organisms typically make up pellets, and the sources used for information about pellets.
  
3. Collect a minimum of 12 wild flowers found in Wisconsin.
  - a. Place them in-between wax paper, pressing them in the pages of a large book for a minimum of 3 days.
  - b. Mount them for display.
  - c. Identify each flower with both common and scientific names.
  - d. Describe their true color as they may have faded.
  - e. Identify the number of petals and/or other flower parts for each and identify whether each flower is a monocot or dicot.
  - f. Describe the leaf arrangements of the plants (see page 645), average plant height, and the location where you collected it.
  - g. Write a paragraph describing the reproductive parts of a flower and the nonreproductive parts of a flower (see pp. 668-669). Attach this or mount it on the front of your display.
  
4. Make an insect collection of 20 different kinds of *insects*.
  - a. Minimum of twenty different genuses (for example, do not include 2 different spiders, 3 different ants, etc.). Make sure they are insects; refer to pp. 762-780 in your textbook for information about insects and what an insect is.
  - b. Neatly display the specimens with pins and labels.
  - c. Identify each with both common and scientific names, and give location of collection.
  - d. Using Table 26.2 as a guide, identify the mouthparts of each insect
  - e. Write two paragraphs. In the first, describe the benefits of insects to humans (minimum of three). In the second paragraph, describe how they are harmful to humans (minimum of three). Attach this or mount it on the front of your display.
  - f. Don't collect any rare butterflies or moths (you probably won't have this problem around here).
  
5. Make a leaf collection booklet.
  - a. Minimum of 12 different tree species.
  - b. Dry and press the leaves in books (some wet ones may ruin books so on each side of the leaf put a piece of white typing paper or wax paper. They also mount better and last longer when they are pressed.
  - c. Display, label, and describe each leaf with these contrasting features (see page 645):
 

- margins (edges):	smooth	vs.	non smooth	
-if non-smooth edges:	-fine sawtooth	vs.	-coarse sawtooth	
- leaf arrangement:	opposite	vs.	alternate	vs. whorled
- veins:	parallel	vs.	palmate	vs. pinnate
- leaf type:	simple	vs.	compound	
- lobes:	deep lobed	vs.	not deeply	
- surfaces:	hairy, rough	vs.	smooth	
  - d. Identify each leaf with common and scientific names, and give the location where leaves were collected.
  - e. Make a creative cover for your booklet (note: overall neatness counts!)

6. Explain the differences between Endangered, Threatened, and Extinct.
  - a. Write a full 2-page paper (minimum length) in which you specifically and thoroughly define and describe the differences between the concepts of “Endangered”, “Threatened”, and “Extinct”.
  - b. Describe and discuss the causes for organisms to become endangered, threatened, and extinct. You should list a minimum of six causes, three of which should be discussed in detail.
  - c. Describe what could be done to improve conditions or prevent further harm to the organisms. In your description, discuss in detail a minimum of three of these. *Check your textbook!*
  - d. Construct a table that provides three or more examples each of plants, birds, and animals of Wisconsin for each of the three categories (that’s 27 organisms). The Wisconsin DNR website has lists. Look for the January 2004 printable version (.pdf) for extirpated (extinct). Hint: *See your teacher for help!*
  
7. Book Report.
  - a. Read **one** of these books, Never Cry Wolf, Mowat; Sand County Almanac, Leopold; Silent Spring, Carson; or The Forest, Caras.
  - b. Share the contents in a minimum 2-3 page book report in which you describe the characters, the main points of the story, and how the book is related to the environment or to ecology.
  
8. Plaster wild animal tracks.
  - a. Find two different *wild* animal’s or bird’s tracks. No pets allowed!
  - b. Make casts of them out of Plaster of Paris.
  - c. Write a full, one page (minimum length) profile of the organism’s biome, habitat, niche, feeding habits and food web, predator/prey relationships, life cycle, where the tracks were found, and other miscellaneous ecological information.
  
9. Wild plant seeds.
  - a. Collect the seeds from 12 wild plants found within your area.
  - b. Display the seeds in an egg carton.
  - c. Identify each seed with both common and scientific names, and give the location where the seeds were collected.
  - d. Write a minimum 1-page paper describing:
    - the two different kinds of plants that produce seeds (angiosperms and gymnosperms)
    - four different types of fruit and the relationship of a seed to a fruit
    - the different methods of seed dispersal
  - e. Indicate how each seed of your collection would be dispersed (e.g. wind, animals, etc.). Refer to pp. 617 and 676 - 679.
  
10. Invasive Species.
  - a. Define what an invasive species is, describe a minimum of three reasons how they occur (or why), and discuss a minimum of three means how man has attempted to combat them.
  - b. Identify 9 invasive species that are now found in Wisconsin (and pictures, if possible) according to the following directions – a minimum of two examples from each category of plant, animal, and fish (or other aquatic animal); the remaining three may be from any of these three categories.
  - c. Minimum length of paper is two full pages.
  - d. Check out your textbook and see web sites from DNR, Fish & Wildlife Service, etc.

Rubric – please see the next page.

## Rubric

This project will be graded according to the criteria listed in this rubric. Each activity will be evaluated according to the instructions and information provided in the list of activities as well as the following guidelines. Each activity is worth 100 points. If you impress your teacher by doing awesome, incredible, outstanding, complete (exceeding the minimum requirements) and excellent work, then you will receive 100 points. Points will be deducted for work that doesn't measure up, is sloppy, incomplete, done the night before it is due, or by not following instructions or by showing little thought.

**PLEASE NOTE: Projects that do not have references will receive a 60% F because that is plagiarism. References provided after the project due date will receive a 10-point penalty.**

All materials for a project must be turned in together to receive full credit and to be considered on-time.

### Points Possible

a	Handwritten information (except on display boards)	5				10	Double-spaced typed information
b	<b>No references = F</b> ; References that are incorrectly formatted	0		5		10	Complete and correctly formatted references
c	Incomplete number of samples	2	4	6	8	10	Complete number of samples
d	Minimal or poor content, information, and details	5		10		20	Detailed or correct and thorough content and information
e	No display / sloppy linework, drawings, captions, labels, photos / paper frizzies / incomplete graphs	5		10		20	Nice display / clean and neat linework, drawings, captions, labels, photos / no paper frizzies / complete graphs
f	Incomplete or incorrect specie or common identifications	0		3		5	Complete and correct specie or common identifications
g	Not following directions	2	4	6	8	10	Follows directions
h	Written work has poor grammar, punctuation, sentence structures, paragraphing, incorrect fonts, margins, style, etc.	3	6	9	12	15	Written work has excellent grammar, punctuation, sentence structures, paragraphing, correct font, margins, style, etc.

### General Advice:

- Use the Writing Center for help and editing on written work
- Proofread so there are 0 writing errors
- When instructions say 'describe', you need more than just a list; be detailed and specific
- When instructions say 'minimum of ...', that gives the baseline for complete work; less than that is failure.