

Wonderful Wetlands

A Secondary & Elementary Collaborative

Unit Outline

1. Project Team Members: Held, M. L. and Lane, T. G.
2. Title of Course: Science, 5th Grade and Natural Resources, 11/12th
3. Title of Unit or Project: Wonderful Wetlands: A Collaborative Unit Between Secondary and Elementary Students
4. Approximate length of Unit or Project: Our wetland unit will be approximately two weeks in length; however, it is but a component of a more extensive water unit that lasts for approximately six weeks.
5. Brief description of the Unit or Project with an expected final outcome:

This wetland unit is designated to introduce **elementary** students to what type of area constitutes a wetland, the functions and benefits of wetlands, and the components of a wetland habitat. **Secondary** students will extend their basic knowledge of wetland areas by mastering specific identification of these sites through hydric soils, plants, mammals, and macroinvertebrates. The entire water exploration unit will culminate with the secondary wildlife and natural resource students guiding the elementary students through a series of water related station activities at the high school nature trail. Afterward, the elementary students will perform wetland skits, and the high school students will present additional learned information to the children.

6. Major Goals of Unit:

Elementary Goals:

Students will be able to:

1. describe a wetland habitat and its components.
2. provide, in writing, at least one example of a wetland food chain.
3. relate wetlands to ecological functions, and relate the importance of wetland functions to their own needs and daily lives.
4. describe interrelationships among precipitation, runoff, and wetlands.
5. explore the influence of soils on water filtration and on human use of an area.
6. utilize their knowledge of metaphors to create metaphors for various wetland components.
7. create wetland skits (depicting story and accurate wetland food chain) for the secondary students.
8. create bird models and, in paragraph form, create an appropriate habitat to match their bird's adaptations.

Secondary Goals:

Students will be able to:

1. define the term “**wetland**”.
 2. describe and analyze the various types of wetlands.
 3. identify and describe hydric soils.
 4. identify and describe wetland plants.
 5. identify and describe typical macroinvertebrates found in wetlands.
 6. identify and describe typical amphibians and reptiles found in PA wetlands.
 7. identify and describe typical mammals that frequent wetlands.
 8. analyze the ecosystems of wetlands.
 9. prepare a presentation on one of the wetland topics for fifth grade student group.
7. Sequence of balanced and integrated activities for students:

Elementary Activities:

Day 1: “Wetland Metaphors” (Project Wild) Students will begin to complete a KWL for the unit. After being separated into groups, students will be given “mystery bags”, filled with various household items. The children take turns removing objects from the bag, and deciding how each one could be representative of a wetland. Metaphors for the objects are then created and visual projects made to the rest of the class.

Day 2: Presentations will be continued, and will be followed by teacher-provided background information.

Day 3: Students will survey a local wetland area.

- Students will choose a central landmark, and then lay out four quadrants with pre-measured 10’-20’ string.
- Students will be divided into smaller groups, and make a map or top-view sketch of the area.
- In each area, students should locate and label the various plants, animals, animal traces and non-living things.
- Students must select three of the plants and three of the animals from their area and list how they meet their basic needs for food, water, air, space and shelter.
- The instructor will then ask the following questions:
Plants: “How many different plants did you find? Were there more larger plants or more small plants? Why? Is there any way we could classify them? Do you think all of the smaller plants will stay the same size they are now? Which ones might grow larger and which will stay the same? Why?”
Animals: “How many animals or animal signs did you find? Do animals meet their needs the same way as plants? Do the animals depend on plants? Do the plants depend on animals? How?”

Day 4:

Students will create bird figurines using paper, glue, clay, etc., depicting at least 3 special adaptations. They will then write paragraphs explaining their habitat, and why their special adaptations are perfectly suited to their habitat. This will be followed by a teacher-led discussion and information on the adaptations of wetland plants and animals.

Day 5:

“Soil Stories” (Project Learning Tree) Instructor will obtain five soil samples – wetland, meadow, forest and schoolyard and garden. Students will compare samples using common soil texture chart. Discuss why vegetation might grow differently on the five sites. Students should address the following in their science logs: “Why did some have more organic matter?” “Which soil will drain better: sandy loam or clay loam?” “In which soil would a plant that needs a lot of water grow best?” “Which sample is the wetland soil?”

Day 6:

Using the same soil samples, students will conduct the soil percolation test described on page 257 of Project Learning Tree.

Day 7:

“Wetland In A Pan” (Wow! The Wonders of Wetlands) Students make a model that demonstrates the flood-buffering and filtering effects of wetlands. Upon completion of the lesson, they will be able to describe how wetlands function to reduce flooding and retain sediments, and analyze what would happen to water, sediments, homes and wildlife if wetlands were destroyed.

Day 8:

Students will be given handouts on nutrients (phosphorous and nitrogen) in wetlands. They will be asked to identify 5 key concepts, and jot down any questions that they may have. Students will be asked to debate, in small groups, the positive and negative aspects of nutrients. Information, provided lecture style, will follow.

Day 9:

Wetland Food Chains: Discuss how the sun is the source of energy for all living things. Divide students in groups, distribute pre-made wetland cards, and ask students to create a food chain with their group members in 60 seconds. Check for accuracy. Students must then include their food chains in a brief skit, to be performed for secondary students.

Day 10:

Nature Trail trip – stations and skits. (Stations include wetland demo., water trivia, hydrologic cycle bracelet making, and mammal station [hides and info. presented by secondary students]).

High School Activities:**Day 1 and 2:**

Students will: research hydric soil characteristics that delineate a wetland, and animal and plant species that would typically be found in a wetland using text, field guides reference books and the internet. Information to be written on teacher provided organizer sheets.

Day 3:

In an outdoor lab situation, students will study examples of wetland indicators provided by teacher.

Day 4:

In an outdoor lab situation, students will identify and write descriptions of: soils, plants, macroinvertebrates, amphibians, reptiles, birds, and mammals found in the wetlands on our Nature Trail.

Day 5:

In an outdoor lab situation, will explain and analyze on a teacher provided advanced organizer, the dynamics of the wetland ecosystem found on our Nature Trail.

Day 6 & 7:

Students will be assigned to groups which will prepare a presentation using posters, models or examples of one of the following: typical soils of a wetland, typical PA plants of a wetland, typical PA amphibians and reptiles of a wetland, typical PA macroinvertebrates.

Day 8 & 9:

Group presentations will be given in class. After assessing the presentations, groups will have the opportunity to revise any weak points.

Day 10:

Nature Trail trip – stations and skits. (Stations include wetland demo, water trivia, hydrologic cycle bracelet making, and mammal station [hides and info. presented by secondary students]).

8. Checklist or rubric of assessment components for students:

******Each individual lesson has a built-in assessment component, be it a performance task, question/answer, or a written product. Formal, summative, paper/pencil testing will occur upon conclusion of the entire water unit; this rubric will be used to evaluate overall student performance on the nature trail.***

Nature Trail Stations Scoring Rubric:

- 3 Student successfully completed each station task and/or led others in this endeavor.
- 2 Student completed station tasks, but needed some help in order to finish.
- 1 Student needed constant intervention from an adult leader in order to complete each station.
- 0 Student did not complete all required stations.

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- 3 Student actively participated with other group members during wetland skit practices.
 - 2 Student participated, but had to be coaxed and was less than cooperative.
 - 1 Student was not at all cooperative and hindered progress.
 - 0 Student refused to participate.

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- 3 Student presented an appropriate skit that was related to the concept taught and reflected a knowledge of the subject.
 - 2 Student skit was related to the concept, but the content was inaccurate.
 - 1 Student skit was not related to the concept.
 - 0 Student did not create skit.
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*Divide number of points earned by possible total points to assign a percentage.

“Stories In Soil”: A Rubric Assessment

- 3 Student thoroughly completed all steps of the investigation.
 - 2 Student completed all steps, but worked hurriedly; not all results were accurate.
 - 1 Student investigation was incomplete.
 - 0 Student did not attempt investigation.
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- 3 Student used soil samples and investigation lab sheet to answer all questions in great detail.
 - 2 Student answered all investigation questions completely.
 - 1 Student answered all questions, but responses were sloppy and incomplete.
 - 0 Student did not answer all questions.
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- 3 Student fully cooperated with group and completed tasks appropriate to his/her assigned role.
 - 2 Student completed job tasks, but talked and distracted others.
 - 1 Student distracted others and did not responsibly complete job tasks.
 - 0 Student did not participate.
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9. Specific Standards addressed in this Unit or Project:

<u>Ref. #</u>	<u>Name of Standard</u>	<u>Title of Individual Standard</u>
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Elementary Standards Addressed:

4.1.7.D	PA-EE	Watersheds and Wetlands (Goals 1 & 6)
4.1.7.E	PA-EE	Watersheds and Wetlands (Goals 3, 4, & 5)
4.4.7.B	PA-EE	Agriculture and Society (Goal 5)
4.6.7.A	PA-EE	Ecosystems and Their Interactions (Goals 2,7,8)
2.3.5.A	PA- Mathematics	Measurement and Estimation (Goal 5)
2.4.5.A	PA- Mathematics	Mathematical Reasoning (Goal 5)
1.3.8.C	PA- RWSL	Reading, Analyzing & Interpreting Lit. (Goal 6)
1.6.5C,D,E	PA- RWSL	Speaking & Listening (Goal 7)
1.5.8.B,C	PA- RWSL	Quality of Writing (Goal 2)

Secondary Standards Addressed:

4.1.12D	PA-EE	Watersheds and Wetlands (Goals 1-8)
4.6.12A,B,C	PA-EE	Ecosystems and Their Interactions (Goals 8 & 9)
2.3.11A	PA-Mathematics	Measurement and Estimation (Goals 3-7)
1.1.11A,C-G	PA-RWSL	Learning to Read Independently (Goals 1-9)
1.2.11A,B	PA-RWSL	Reading Critically in All Content Areas (Goals 1-9)
1.4.11B	PA-RWSL	Types of Writing (Goals 2-9)
1.5.11B,C,E,F	PA-RWSL	Quality of Writing (Goals 2-9)
1.6.11A,C-E	PA-RWSL	Speaking and Listening (Goal 9)
1.8.11B,C	PA-RWSL	Research (Goals 1-9)