# Wild About Wetlands

**An Integrated Unit**
by
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# Wild About Wetlands

**Introduction:**

Destruction of wetlands environments has been a controversial issue in North America for many years. Some people view wetlands as annoying at best, or as dangerous breeding grounds for disease-carrying mosquitoes and other health problems at worst. Others recognize them as valuable habitats for a variety of animal and plant life—much of which is useful to humans. In this unit, students will explore a variety of wetlands life as well as various attitudes toward wetlands. They will also explore underlying issues of how we deal with problems or people who are annoying, difficult, or different and develop strategies for dealing with such problems and people in an appropriate and Christ-like manner.

This unit is designed for students in grades 4-6, although much of the material can be adapted for older or younger students. It is designed to last 3-4 weeks. Activities will involve outdoor study as well as reading the novel Gone-Away Lake by Elizabeth Enright.

**Unit Goals:**

**Content Goals:**

1. Students will identify examples of various invertebrates, including arachnids, insects, and centipedes and describe characteristics of each.

2. Students will identify examples of various vertebrates living in wetlands areas.

3. Students will describe the characteristics of various kinds of plant life found in wetlands and identify examples of each.

4. Students will analyze the interdependent relationships between various forms of wetlands life.

5. Students will comprehend the resources that humans gain from wetlands.

**Attitudinal Goals:**

1. Students will develop an appreciation and respect for the variety of and interdependence between living things found in North American wetlands.

2. Students will develop a positive appreciation for people who are different from themselves.

Process Goals:

1. While studying wetlands life, students will learn to gather and analyze data and show the results of their analysis through creating various kinds of graphs.

2. Students will learn to analyze characters and character development in a novel.

3. Students will learn to care for a microscope and set up and view slides.

4. Students will learn to use observation and note-taking skills in the course of field studies.

5. Students will develop strategies for dealing with difficult problems or people in an appropriate and Christ-like manner.

# Unit Overview

Day 1: Introduce wetlands.
Do "Wetlands Metaphors" activity
Introduce and begin reading Gone-Away Lake

Day 2: Visit a wetlands community
Fill out "Being There Book"
Do "Wetlands Definition" activity

Day 3: Gone-Away Lake, chapter 2
"Classifying Animals"—provide pictures of animals for students to classify if they did not visit a wetland yesterday.

Day 4: Gone-Away Lake, chapter 3
Begin creating "Wetlands Life" booklet based on trip observations and information in Gone-Away Lake
Insects: complete and incomplete metamorphosis activity

Day 5: Gone-Away Lake, chapter 4
Continue working on booklet
Small group research activity: "Marauding Mosquitoes"

Day 6: Gone-Away Lake, chapter 5
Plant and animal adaptations to wetlands life
Continue working on booklet

Day 7: Gone-Away Lake, chapter 6
Identify arachnids
Differentiate between arachnids and insects
Continue working on booklet

Day 8: Gone-Away Lake, chapter 7
Distinguish between centipedes and millipedes
Continue working on booklet

Day 9: Gone-Away Lake, chapter 8
Vertebrates of the wetlands
Continue booklets

Day 10: Gone-Away Lake, chapter 9
Plants of the wetlands
Continue booklets

Day 11: Gone-Away Lake, chapter 10
Examine food chains and interdependence in wetlands

Day 12: Revisit wetlands
Compare observations with first visit
Collect algae and water samples
(If you can do only one visit to a wetlands area, make it this one.)

Day 13: Gone-Away Lake, chapter 11
Use and care of microscopes
Examine algae and water samples
Identify type of algae and other organisms in water
Identify cell parts in algae

Day 14: Gone-Away Lake, chapter 12
Create graphs illustrating data collected on trip

Day 15: Gone-Away Lake, chapter 13
Begin final activity

Day 16 Gone-Away Lake, chapter 14
Work on final activity

Day 17 Gone-Away Lake, chapter 15
Finish final activity

Day 18 Unit wrap-up
Present final projects

# Wetlands Study Trip

The best way to learn about life in the wetlands is to visit a wetlands area. Two trips to wetlands are included in this unit: one on day 2 and one on day 12. The first trip is intended to be an introduction to the wetland environment. Students will explore and acquaint themselves with the wetland, recording living things they see by drawing pictures of them. They will use these drawings in several activities later in the unit.

If you do not have any wetlands near your school, or if you are unable to arrange two off-campus trips so close together, a video on wetlands life could substitute for this trip. You might also check out some of the "Wetlands Information" websites listed at the end of this unit for virtual tours of wetlands areas.

Whether you take students on a real trip or a virtual one, have them fill out the booklet in the Teacher Resource file. Vocabulary words you may want them to know and species of wildlife you may want to call to their attention will vary with different regions and types of wetlands.

Materials needed for first trip: one copy of study trip booklet for each student, pencils or pens, field guides (optional).

The second trip is scheduled late in the unit. It would be good to return to the same wetland you visited earlier if possible. Now that students have learned about many of the living things in the wetlands, it will be interesting for them to see how many they can identify. They will also be asked to carry out detailed observations in a small area and record the data for future activities at school. They will need to collect water and algae samples as well. A booklet for this trip is included in the Teacher Resource file as well.

# Wetlands Metaphors

**Materials needed:** large pillowcase, bag, or box; small pillow; sponge; egg beater or mixer; small doll cradle; sieve; wild rice.

**Procedure:** Prepare a "Metaphor Container" (pillowcase, bag, or box) filled with the other objects. The container should have an opening large enough for a hand to reach in and retrieve an object.

Introduce wetlands to the class through posters, pictures, stories, etc. Ask: "How do you feel about wetlands? Do you think wetlands are important?" Discuss their answers. Share details from the **Background Information** at the end of this section if you need to.

Explain that you are going to make a list of reasons wetlands are important using metaphors. Metaphors represent a concept or idea through another concept or idea. Psalm 23 provides several familiar examples of metaphors ("The Lord is my shepherd. . .) The metaphors in this activity are common objects that represent benefits of wetlands.

| Object | Metaphoric Function |
|---|---|
| Sponge | Absorbs excess water caused by runoff; retains moisture for a time even if standing water dries up. |
| Pillow | Provides a resting place for migratory birds |
| Egg beater | Mixes nutrients and oxygen into the water |
| Cradle | Provides a nursery that shelters, protects, and feeds young wildlife. |
| Wild rice | Provides food for wildlife and humans |

Divide the class into small groups. A representative from each group will choose an item from the "Metaphor Container." All items in the box have something to do with wetlands. Each group must decide how the object could represent what a wetland is or does. Allow time for them to discuss their answers as a group; then have each group present its object and ideas to the class. Examples are given in the chart below, but students may come up with other ideas.

As students report to the class, discuss each idea and invite others to add to those ideas. At the end, ask the class to summarize the major roles that wetlands perform.

Close the activity by noting that humans have a connection to wetlands and that their survival depends largely on human activities.

**Background information:** Why should we study wetlands? Wetlands provide special benefits to plants, animals, humans, and the total environment.

Because of the abundance of food, vegetative cover, and water found there, most wetlands are rich with diverse wildlife species. Coastal and inland marshes, for example, provide breeding, resting and wintering habitats for thousands of migratory birds—including ducks, geese, swans, herons, and other wading birds, and shorebirds. Many species of fish and shellfish that are important for commercial and personal use by humans reproduce and spend part, or all, of their life cycle in fertile wetlands. Many reptiles, amphibians, insects, and mammals also breed and live in wetlands. Often referred to as "nurseries," wetlands provide critical breeding and rearing habitat for countless numbers and kinds of wildlife.

Wetlands also have the ability to purify the environment. They act as natural filtering systems. Of great importance to humans is the flood control ability of wetlands. When runoff from rain and spring thaw is high, wetlands absorb extra water until it gradually drains away down streams and rivers and through the soil.

As remarkable and resilient as wetlands are, they do have limits. Their destruction and/or abuse can have devastating effects on wildlife, humans, and environmental quality. We need a better understanding of wetlands and their importance as wildlife habitat and ecosystems that benefit us.

(Credit: This activity is adapted from WOW!: The Wonders of Wetlands, Environmental Concern Inc., 1991, p. 20.)

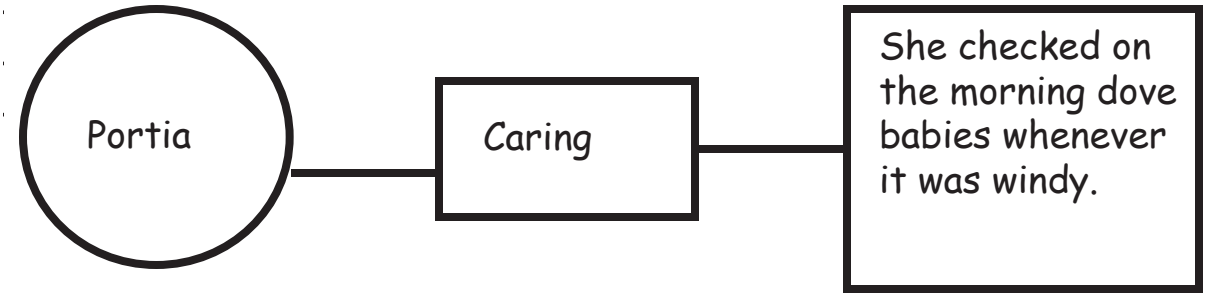
**Gone-Away Lake**
Chapter 1

Read chapter 1 in Gone-Away Lake.

1. Describe the setting of this book. Remember, setting includes time as well as place. Is this book set in modern times? In the past? In the future?

2. Begin filling out the character web your teacher will give you. Choose one of the main characters in this story. Write his/her name in the circle in the middle of the web. Then, in each small rectangle, write one character trait that describes this person. In each large square, write one detail from the story that provides proof of the character trait next to it.

Example:




3. On the back of this paper, draw a picture of the character you chose. Be sure your picture matches the description in the book.

# Defining Wetlands

Wetlands are more than just "land that is wet." There are different kinds of wetlands, and different definitions of exactly what wetlands are.

Based on your observations of wetlands you have visited, how would you define wetlands"? Be sure to include in your definition characteristics you observed which seem to set wetlands apart from other environmental habitats.

## Gone-Away Lake
## Chapter 2

1. Make some predictions:

   What do you think the writing on the rock means? Who put it there?

   Why is a rowboat in the middle of the swamp?

   How can you explain the presence of the old houses at the edge of the swamp?

2. Finish filling in the character web you started in chapter 1. Be sure you have listed six different character traits and one example of evidence for each.

3. Now use your character web to help you write a short essay describing the character you chose.

   a. Paragraph 1: Introduce your character. Tell who he/she is and what he/she looks like.

   b. Paragraphs 2-4: Choose 3 character traits from the web. Write one paragraph for each, telling the trait and citing evidence from the story to show that the character possesses that trait.

   c. Paragraph 5: Write a one-sentence conclusion for your essay.

# Classifying Animals

Scientists have a way of sorting, or classifying, all living things. The scientific classification system is kind of like an address—you start with a large, general category and then narrow it down until you arrive at one individual. Look at the information in a mailing address:

| | |
|---|---|
| Country | United States |
| State or Province | New York |
| City | Syracuse |
| Street | Avery Avenue |
| Number | 412 |
| Last name | Doe |
| First name | Jane |

When scientists classify living things, they also start with a large, general group called a Kingdom. There are five Kingdoms: animal, plant, fungi, protist, and moneran.

1. Animal - (many-celled, complex organ systems, movement, and reproduction) Examples: Humans, dogs, etc.

2. Plant - (many-celled, specialized tissues for food production) Examples: Wheat, corn, pansy, rose etc.

3. Fungi - (many-celled, absorb nutrients from other organisms) Examples: Bread mold, yeast, mushrooms, morels, etc.

4. Protist - (single-celled and many-celled, some stationary and some move) Examples: Algae, amoebae, paramecium, etc.

5. Moneran - (single-celled, no nucleus) Examples: Bacteria

The animal kingdom is divided into two groups: vertebrates and invertebrates. Vertebrates have backbones and include such animals as birds, fish, and mammals. Invertebrates do not have backbones. In fact, they often have no bones at all!

Just as a country is divided into states or provinces, invertebrates are divided into eight groups called phyla. The eight phyla of invertebrates are: sponges, coelenterates, flatworms, roundworms, segmented worms, mollusks, echinoderms, and arthropods.

States or provinces can be divided into cities and towns. Phyla are divided into classes. The phylum of arthropods is divided into classes: insects, crustacea, diplopoda, chilopoda, arachnida, xiphosura, and trilobota (extinct).

Cities and towns are divided into streets. Classes of animals are divided into orders. The orders of insects are: orthoptera, hemiptera, homoptera, diptera, lepidoptera, coleoptera, and hymenoptera.

Each of these orders can be narrowed further. Families of animals are a more specific classification, just as your house number is a more specific location than just the name of your street. The genus of an animal is like telling your last name. If you want to really get specific, you name the species of animal.

Here is an example of an animal "address" or classification:

| | |
|---|---|
| Kingdom | Animal |
| Phylum | Arthropod |
| Class | Insect |
| Order | Orthoptera |
| Family | Acrididae |
| Genus | Romalea |
| Species | microptera |

You say you never heard of an animal called "Romalea microptera"? That may be because you know it by its common name: grasshopper!

(Parts of this lesson based on: Goslin, Nancy, "Insect Classification, Anatomy, and Orders", http://www.successlink.org/great/g992.html)

# My Animal Classifications

Choose two animals you saw on your study trip (or two pictures your teacher gives you). Use resource materials to help you classify these animals scientifically.

**Animal 1:**

Kingdom: _____

Phylum: _____

Class: _____

Order: _____

Family: _____

Genus: _____

Species: _____

Common name: _____

**Animal 2:**

Kingdom: _____

Phylum: _____

Class: _____

Order: _____

Family: _____

Genus: _____

Species: _____

Common name: _____

## Gone-Away Lake
## Chapter 3

Read chapter 3 in Gone-Away Lake.

1. Look back at the predictions you made after you finished reading the chapter. Which questions could you answer now? Which one has not yet been answered?

2. Write a paragraph telling what "Gone-Away" is and how it came to be a swamp.

3. Begin making a field guide to life in the wetlands. Your teacher will give you a form to use. Begin by making pages for the plants and animals you saw on your study trip. Then add plants and animals that Portia and Julian learn about as they visit Gone Away. You will keep adding to this booklet throughout this unit.

# Field Guide
## (Teacher's page)

A template for field guide pages is included in the Teacher Resource folder of this unit. This will serve as an ongoing project throughout the unit. It allows students to keep a running record of the various forms of wetland wildlife they study.

Each page requires students to draw the specimen and record its scientific name, common name, place seen (if applicable), and other comments. Encourage students to add other information, such as usefulness to humans, behavioral characteristics, or eating habits.

Students may include wildlife they observe on their trips to the wetlands as well as the wealth of wildlife introduced throughout Gone-Away Lake. Be sure they recognize and include all forms of wildlife, including animals, plants, fungi, and algae.

# Insect Growth and Metamorphosis

When a bird hatches from an egg, you recognize it right away as a bird. It looks like an adult bird—only smaller and fluffier. However, when an insect hatches from an egg it grows and changes by distinct stages. This process is called **metamorphosis**. Not all insects go through these stages in the same way, though. There are four different types of metamorphosis.

Go to this website to learn more about the types of metamorphosis:

http://www.uky.edu/Agriculture/Entomology/ythfacts/4h/unit2/hoigr&cf.htm

Now, using your classroom resources, find examples of insects representing each type of metamorphosis. Draw pictures of each, or write names and descriptions of each, in the chart below:

| No metamorphosis | Gradual metamorphosis |
|---|---|
| Incomplete metamorphosis | Complete metamorphosis |

## Gone-Away Lake
## Chapter 4

Read chapter 4 in Gone-Away Lake.

1. You have now met two more major characters in this story: Mrs. Cheever and her brother. Write a paragraph describing **one** of them. Do you think you would like to meet this person? Why or why not?

2. Why do the children decide to keep their new friends a secret? Do you think that is a good decision? Why or why not?

# Marauding Mosquitoes

One problem at Gone-Away is the abundance of mosquitoes. They are so bad that Mrs. Cheever has invented a special AP Decoction to keep them away.

Mosquitoes can be a problem in real life, too. Because mosquito larvae live in the water, mosquitoes live and breed in and near standing water. This can cause problems for people and animals that live in or near wetland areas. Besides being annoying, mosquitoes can actually be dangerous.

Work with a partner or small group to complete the following activity.

Use at least two resources from your class library or the internet to learn about mosquitoes, the diseases they can spread, and what can be done to control them. In particular, look for information about the following:

One disease spread by mosquitoes

Symptoms of that disease

Treatment for that disease

Things citizens can do to control mosquitoes

Present your findings to the class in **one** of the following ways:

1. Write a short report detailing your findings and present it orally.
2. Create a poster or cartoon strip showing the dangers associated with mosquitoes and what can be done to solve the problem.
3. Write and perform a radio or television public service announcement to make the public aware of the problem and possible solutions.

## Gone-Away Lake
## Chapter 5

Read chapter 5 in Gone-Away Lake.

1. How many gardens does Mr. Payton have? Why did he plant more than one? Do you think he has a good idea? Why or why not?

2. Authors use several techniques to make their characters "come alive" or seem like real people. Fill out the chart below by finding an example of each technique and explaining what that example tells you about Mr. Payton.

| Technique | Example | What it tells you |
|---|---|---|
| Description | | |
| Conversation | | |
| Action | | |
| | | |

# Adapting to the Wetlands

(Internet Activity)

To adapt means "to make suitable for a specific use or situation." People sometimes have to adapt, change their way of doing things, to fit a specific situation. Uncle Pin and Aunt Minnehaha have had to adapt to living at Gone-Away. List three ways they have adapted to life at the edge of a swamp.

_____

_____

_____

God has made certain plants and animals specially adapted to life in the wetlands. Click through this website,

http://mbgnet.mobot.org/fresh/slide/intro.htm

Watch for ways God has made each of these plants or animals specially adapted for life in a wetland environment. List at least 5 specific adaptations you observe.

_____

_____

_____

_____

_____

_____

## Gone-Away Lake
## Chapter 6

Read chapter 6 in Gone-Away Lake.

1. Write a paragraph explaining how the writing came to be engraved on the rock in the woods.

# Amazing Arachnids

Arachnids are members of the phylum arthropoda, as insects are. Animals such as spiders, ticks, and scorpions are arachnids. Use the information below and what you already know about insects to fill in the comparison/contrast chart your teacher gives you.

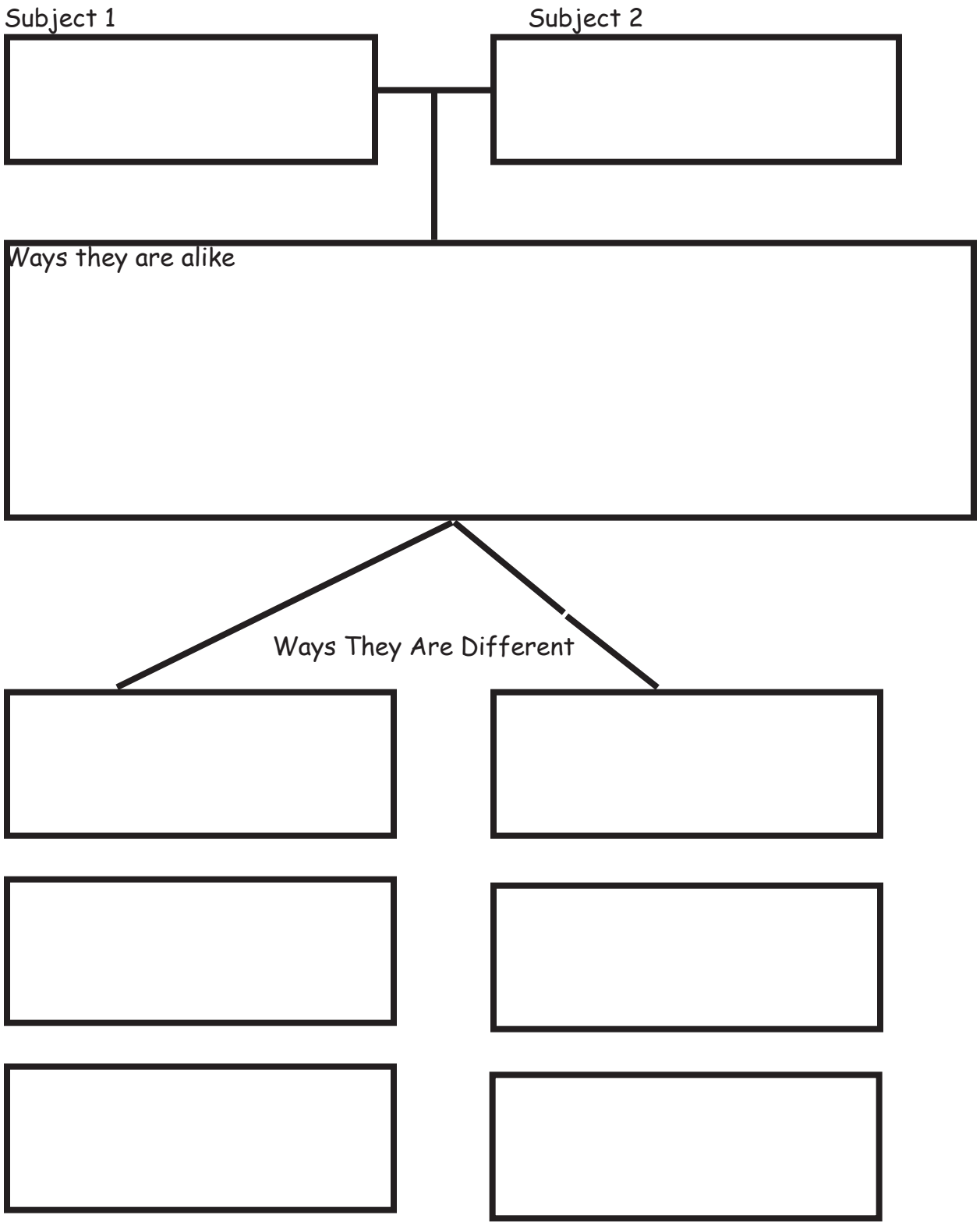
**Arachnids** are animals that have an exoskeleton—their skeleton is on the outside of their body. Their bodies are divided into two parts, the prosoma and the abdomen. The prosoma anchors the chelicerae (pincers), pedipalps (mouth), and four pairs of legs.

Arachnids are aggressive predators. They are cold-blooded, which means their bodies take the temperature of the environment around them. Arachnids breathe air through book-lungs, which are kind of like the gills fish use to breathe.

**Insects** are animals that have an exoskeleton. Their bodies are divided into three segments, the head, thorax, and abdomen. Their three pairs of jointed legs (and wings if they have them) are attached to the thorax. On their heads are compound eyes and two antennae.

Insects breathe through holes called spiracles.

# Comparison/Contrast Chart



## Gone-Away Lake
## Chapter 7

Read chapter 7 in
Gone-Away Lake.

1. Portia and Julian have never met Tark or Baby-Belle Tuckertown, but after exploring their summer home and listening to Mrs. Cheever's and Mr. Payton's memories, they must feel as if they knew them well. How well do you "know" them? Write a paragraph describing either Tarquin or Baby-Belle Tuckertown.

2. What do Portia and Julian decide to call their club? Do you think that is a good name? Why or why not?

# Centipedes and Millipedes

Another kind of wildlife Portia and Julian might find in the old houses at Gone-Away are centipedes and millipedes. Read the information below and then answer the questions.

Centipedes and millipedes are closely related to insects and arachnids. They have long, segmented bodies. Centipedes have one pair of legs attached to each segment; millipedes have two pairs on each segment.

Centipedes have a pair of poison claws located just behind their heads. They use these to paralyze their prey—usually small insects. Animals with poison claws sound pretty scary, but actually centipedes rarely harm people. Their jaws are too weak to puncture human skin in most cases. If you were to be bitten by a centipede, it would be kind of like a mild bee sting.

Centipedes can live a long time—up to 6 years! They like dark, moist places where they can find plenty of food.

Millipedes are often mistaken for worms. They are dark brown or black and have long, rounded bodies. Unlike centipedes, they have no poison claws. They also live in dark, moist places and eat decomposing organic matter.

1. How are centipedes and millipedes alike? _____

   _____

2. How are centipedes and millipedes different? _____

   _____

3. Why would Portia and Julian be likely to find these creatures in an old house? _____

## Gone-Away Lake
## Chapter 8

Read chapter 8 in Gone-Away Lake.

1. Portia and Julian are finally decorating their clubhouse. Where do they get the materials for decorating? Where will their clubhouse be?

2. You are decorating your own clubhouse! Where would it be? How would you furnish and decorate it? Write a paragraph describing your clubhouse. Then, on the back of this paper, draw a picture or floorplan of the clubhouse.

3. How do Portia and Julian feel about riding home with Mr. Payton? Why do they feel that way? How do other people react to seeing the old car?

# Animals with Backbones

The animals we have examined in detail so far have all been invertebrates—animals without backbones. Those certainly are not the only animals in the wetlands, though. Wetlands are important to a variety of vertebrates.

Take out your booklet you filled out when you visited the wetland area. List all the vertebrates you saw. Be sure you tell to which order they belong, too. The orders of vertebrates are: mammals, birds, fish, reptiles, and amphibians.

_____

_____

_____

_____

Now choose one vertebrate that lives in the wetlands. Do some research to discover the following information:

1. Why is a wetland habitat important for the survival of this animal?
2. How is this animal specially adapted for life in the wetlands?
3. What does this animal eat?
4. Find out at least four other facts about this animal that you feel are interesting or that make this animal unique.

You might want to check out some of these sites for information:

http://www.kidport.com/RefLib/Science/Animals/Animals.htm
http://www.lethsd.ab.ca/mmh/grade5/wetlands/page4.htm
http://mbgnet.mobot.org/fresh/wetlands/animals/

Now share your findings with the class, either in writing or orally. Be sure to add this animal to your "Wetlands Field Guide" if you haven't already.

## Gone-Away Lake
## Chapter 9

Read chapter 9 in Gone-Away Lake.

1. Portia and Julian start this trip with an argument about who will be president of their club. List three ways they could make decisions about organizing their club without arguing. Which way do you think would be best? Why?

2. Write a paragraph describing Foster's adventure in this chapter.

3. What was the Gulper? How did it work? Use reference materials in your classroom or this website: http://www.howstuffworks.com/quicksand.htm to help you.

# Plants in the Wetlands

## (Teacher's Page)

This activity may be done as a class demonstration or as a lab activity in small groups. If students do the actual dissecting, be sure to go over safety procedures ahead of time.

**Materials needed:** cattails—the whole plant including the root, dissecting equipment or sharp knife and cutting board, magnifying glass, copies of the student lab sheet.

**Procedures:** Tell the class that you are going to study one plant that grows in wetlands to see how God has specially adapted it to live in a wet environment.

Hand out lab sheets (students may fill out individual sheets whether this is done as a lab or as a whole-class demonstration). Have students examine the whole cattail without pulling any of it apart. Instruct them to observe carefully and then do activity #1 on the lab sheet.

Continue following instructions on the lab sheet. Activities 3-5 involve cutting cross-sections of the leaf, shoot, and stem. If you choose to do this activity as a whole-class demonstration, cut enough sections for each student to have one to examine closely.

**Resources:** The following website contains excellent information, close-up pictures, and even recipes using cattails: http://www.wildmanstevebrill.com/Plants.Folder/Cattails.html

(Parts of this activity are adapted from WOW! The Wonders of Wetlands, Environmental Concern Inc., 1991, p. 27)

# Plants in the Wetlands
## (Student Lab Sheet)

As Foster made his way through the swamp, he had to walk through high reeds. These were probably cattails or some of their close relatives. Today we are going to take a closer look at these wetland plants.

1. Carefully examine the cattail your teacher gives you. Do not pull it apart. Examine all the parts and how they are attached to each other. On the back of this paper, draw a picture of the plant, labeling these parts: roots, shoot, stem, leaf, flower.

2. Pull off one of the leaves. Where are the leaves attached to the stem?

_____

Are both sides of the leaf the same? _____

Is the leaf flat or does it have some thickness? _____

3. Cut the leaf cross-wise and look at the cut edge with a magnifying lens. What is inside the leaves that makes them hard to tear?

_____

_____

4. Cut a thin slice of the shoot and draw it below.

The shoot is edible! Taste a piece (after washing it well!) How does it taste? What do you think the white, spongy stuff inside is for?

_____

_____

5. The stem holds the flower up. Cut the stem cross-wise and then cut a thin slice off. Observe the slice under the magnifying lens. Draw a picture of the middle of the stem below.

What do you think the holes in the pith are for? (Hint: wetland plants grow in wet soil that has no oxygen; plants' roots need oxygen.)

_____

_____

6. Carefully pull some of the fuzz from the cat's tail. Examine some under the magnifying lens. Are they all the same? What differences do you see?

7. Write a paragraph summarizing the ways God has adapted cattails to survive in a wetlands environment.

**Gone-Away Lake**
**Chapter 10**

Read chapter 10 in Gone-Away Lake.

1. In this chapter, Uncle Pin is reading the newspaper. What is the date of that newspaper? How old would that paper be today?

2. Pin tells his sister, "You know I always try to read a paper of the same day. The year doesn't signify." Finding out what happened on "This day in history" can be fun! Use resources in your library,y or check out this website: http://www.historychannel.com, to discover two things that happened to day—in history.

3. Make some more predictions: Will things change now that Foster and Julian's

parents know about Gone-Away? How will they change? Will it be better or worse now that others know the secret?

# Food Webs

## (Teacher page—Partner activity)

**Materials needed:** pictures of a variety of wetlands life, markers, yarn, poster board.

**Procedure:** Introduce your students to the concept of food chains and food webs. A food chain follows one particular line of consumption. For instance, grass-rabbit-fox is an example of a food chain. The grass makes its own food through photosynthesis, the rabbit eats the grass, and the fox eats the rabbit.

A food web is a little more complicated. A food web for an oak tree might include beetles and ants that feed on the tree, squirrels that eat the acorns, and woodpeckers that eat the insects.

There are three categories in any food chain or web: **producers**, who create their own food through photosynthesis; **consumers** who must hunt or forage for food, and **decomposers** who get their food by breaking down parts of organisms to their simple forms.

Ask students to name examples of producers, consumers, and decomposers they have learned about in this unit. Some examples:

Producers: cattails, grass

Consumers: mosquitoes, frogs

Decomposers: worms

Hand out materials to partners. Instruct them to choose at least six pictures representing a variety of plants and animals found in wetlands. Have them arrange the pictures on their poster board.

Have students look for food web relationships between the living things they have chosen for their poster. Have them show those relationships by connecting pic-

tures with yarn and drawing arrows to show which living things eat which.

Display finished posters.

# Wetlands Study Trip 2
## (Teacher Page)

This trip is essential for many of the activities that follow in this unit. The purpose is three-fold: to revisit the wetlands and compare notes with your earlier visit, to further hone observation skills, and to collect water and algae samples for further study.

**Activities:**

**Square Foot:** Materials needed: One 4-foot length of string or yarn for each student. Students will tie the string to form a loop. Students will place their loop on the ground and spend 10 minutes observing everything within that loop. They are to record as many different species of both plants and animals as they can. (Let them draw pictures of things they can't identify.) They also need to count and record how many of each species they see. They may include non-living things, such as rocks or standing water, as well.

Be sure you are familiar with the area you will visit, as well as any restrictions, before allowing students to stray from the trail.

**Classifying:** Students will review what they have learned about wetlands plants, insects, and arachnids. Throughout the trip, have them record any examples of these three things that they see. Let groups compete to see who can find the most in any one category.

**Collecting Samples:** Materials needed: baby food jars or other containers that

can be sealed. Students will need to collect samples of water and of algae for further [illegible] classroom. Be sure to ask permission to collect if you will [illegible] lic nature preserve. Collect several samples [illegible] t last.

**Gone-Away Lake**
**Chapter 11**

Read chapter 11 in Gone-Away Lake.

1. What do Julian's friends know about Gone-Away and the people living there when Julian first talks to them about joining the club? What do they think of the old man and woman? Why do you think they feel that way?

2. How do Tom and Joe feel about Uncle Pin and Aunt Minnehaha at the end of the chapter? Why do you think they changed their minds?

# That Green Scum . . .

Today you are going to take a closer look at the algae and water samples you collected during your latest trip to the wetlands. We have looked at many members of the plant and animal kingdoms that can be found in the wetlands. But there are three more kingdoms. Look back at your activity sheet. What are the other three kingdoms?

_____

Some members of these kingdoms can only be seen through a microscope. Follow your teacher's instructions for setting up the microscope and slides. Look at some of your samples through the microscope. In each box below, draw a different sample. Use reference books or internet sources to identify the things you see. Label them on your drawings.

| | |
|---|---|
| | |

Use library or internet resources to learn more about algae and why it plays an important part in the wetlands environment. On the back of this paper, write a paragraph summarizing your findings.

**Gone-Away Lake**
**Chapter 12**

Read chapter 12 in Gone-Away Lake.

1. Pretend you are Baby-Belle Tuckertown. Write a journal entry for the day you rescued the summer cats. Be sure to tell the story from your own point of view.

2. Aunt Minnehaha compares Mrs. Brace-Gideon to an ocean liner or a battleship. In what ways was Mrs. Brace Gideon like a battleship?

3. Choose one other character in this book. To what would you compare that character? Why do you think that is an appropriate comparison?

# Wildlife Observations

You will need the "A Square Foot of Wetland" page from your Study Trip booklet for this activity. In the boxes below, make a tally chart showing the different types of wildlife you observed and how many specimens you observed in your square foot.

| Plant Kingdom | Animal Kingdom |
|---|---|
| | |

Were [illegible] wildlife more plentiful than others? Do you s[illegible]onship be[illegible] and kind of plants in your square foot and [illegible] kind o[illegible] your results with those of your group r[illegible] they si[illegible] account for differences? Write a short[illegible] your c[illegible]

Then, on another sheet of paper, design a graph to show the results of your wildlife survey.

**Gone-Away Lake**
**Chapter 13**

Read chapter 13 in Gone-Away Lake.

1. In this chapter, Foster and Davey found a turtle with a name and date carved in its shell. What name and date were carved there?

2. Look at the copyright date on the back of the title page of this book. This is the year the book was first published. How old would the turtle have been in that year?

3. Using reference sources in your classroom or on the internet, find out how long turtles usually live. Could that turtle really have been that old?

4. How old would that turtle be if it were still alive today? Is that possible according to your research?

# Final Project
## (Teacher page)

The final project for this unit allows students to examine some real-life issues involving wetlands. Be sure to allow adequate time (at least 2-3 class periods) for students to research the problem and possible solutions and to develop their response.

The project itself is detailed on the student page. Students may present their learnings in a variety of ways:

1. Town Hall Meeting: Teach parliamentary procedure as you coordinate a Town Hall or Town Council meeting to discuss the issue. Assign different groups to take different sides in the discussion.

2. Advertising campaign: Assign groups to create an advertising campaign to publicize their viewpoint. They can design billboards, write and perform scripts for radio and TV ads, and publish magazine ads.

3. Letters to the editor: Have one group member write an editorial for the Schooltown newspaper dealing with this scenario. Other group members may write letters to the editor responding to the editorial. The group might include an editorial cartoon as well.

As an alternative to these scenarios, you may want students to find actual news stories dealing with wetlands issues. Research these issues and use the above activities to publish your findings.

# Final Project

You are a resident of Schooltown, a growing community. Residents of Schooltown enjoy relaxing in their back yards or hiking in the nearby woods on weekends. Their biggest inconvenience at the moment is the fact that they have to drive 25 miles to Big City to shop since that is where the nearest malls and department stores are located.

Just outside Schooltown, near the highway leading to Big City, is a 15-acre wetland area. In your learning group, choose one of the scenarios described below and do the following:

1. Examine the issue and decide as a group what position you will take.

2. Choose a name for your organization.

3. Make a list of reasons why you are taking the position you have chosen. Be sure to research all possibilities carefully and look at the possible consequences for each choice.

4. [illegible] possible reasons for the "other" point of vie[illegible]uld you [illegible]h of these reasons?

[illegible]sts include possible effects on wildlife [illegible]

**Scenario 1:** A large department store has purchased 10 acres of wetland along the highway at the edge of Schooltown. They propose to fill in the swamp and build a store and large parking lot. Many Schooltown residents would love to have a department store nearby. Others are against filling in any of the wetlands area. Which side will you take? Why?

**Scenario 2:** It is June. Scientists have found West Nile virus in a dead crow found along the highway 5 miles from Schooltown. Many Schooltown residents would like the town to spray insecticides over the wetland near the edge of town to kill mosquitoes. Others are concerned about the effects spraying would have on other wetlands life as well as on the town residents. A town meeting has been called to discuss the issue. Which side will you take? Why?

**Gone-Away Lake**
**Chapter 14**

Read chapter 14 in Gone-Away Lake.

1. Think back to the first two chapters of this book. How did Portia feel about the swamp and Gone-Away when she first saw it?

2. How does she feel now? Why do you think she changed her mind?

3. [illegible] chapter 11. Tom and Joe also changed their mi[illegible] Uncle [illegible] Minnehaha after they met them. What ge[illegible] you [illegible] people deal with things or other people [illegible]

4. **Think about it:** (You do not need to write your answer to this question.) Is there someone you "put down" or don't like? Could it be because you don't know him/her? What can you do to change?

**Gone-Away Lake**

**Gone Away Lake**

**Chapter 15**

Finish reading Gone-Away Lake.

1. Write a critique of Gone-Away Lake. Use this format:

   a. Paragraph 1: a summary of the story

   b. Paragraph 2: specific things you liked about this book. Give examples from the story to support your points.

   c. Paragraph 3: specific things you did not like about the book.

   d. Paragraph 4: Your recommendation.

# Additional Activities

**Oral Histories:** Portia and Julian learn a great deal about the history of their community and about life at the turn of the last century through the stories Uncle Pin and Aunt Minnehaha tell them. Have your students "collect" stories from older people in their families or in your church.

Teach and practice interviewing skills. Then have your students interview grandparents, older church members, or residents of a nursing home. Have them tape the interviews if possible. Then share the stories with the class.

***Gone Away Lake***

**Notes on vocabulary words:** Vocabulary lists are included for each chapter of Gone-Away Lake. These are intended for teachers who wish to teach specific reading vocabulary for this book. No specific reading vocabulary activities are included on the student sheets. However, teachers may wish to choose from some of the following activities:

**Dictionaries:** Have students, either individually or in groups, create their own dictionaries, adding words, definitions, and illustrations as necessary throughout the book.

**Vocabulary Memory:** Have students make two sets of cards the same size and color. Write vocabulary words on cards, one word per card. Write the definition for each word on another card. Place cards face-down and play Memory by turning cards over two at a time. If a word and its definition are turned over, the player keeps those two cards. If no match is made, cards are turned face-down again and play continues.

**Crossword Puzzles:** Have students create crossword puzzles using their vocabulary words.

**Pi` ctionary:** Divide students into small groups. One student in each group is the artist. He/she draws a picture or symbol representing a vocabulary word while other group members try to guess the word. Groups see how many words they can identify within a given time period.

**10 Times in a Day:** Challenge students to use a specific vocabulary word at least 10 times in one day. They must keep a record of when, how, and why the word was used.

**Chapter 1: p. 13-24 "The Beginning of It All"**

Vocabulary: virtuous
gratified
dwindled
aristocratic
yacht
condescending
surfeited
attire
infectious
proprietary

**Chapter 2: p. 25-34 "The Stone and the Swamp"**

Vocabulary: apparel
inconspicuous
caddis cases
voraciously
turrets

Chapter 3: p. 35-46 "Gone-Away"

Vocabulary: suave
precariously
pampas grass
pompadour
dwindle

cataclysm
trousseaux

**Chapter 4: p. 47-55 "My Brother Pindar"**

Vocabulary: baize
austere
linoleum
accentuated
decanter
deference

**Chapter 5: p. 56-69 "The Second Time"**

Vocabulary: vertical
encroaching
adornment
pendulum
ingenuity
shrewd
peevish

**Chapter 6: p. 70-82 "The Knife and the Buttonhook"**

Vocabulary: besieged
impunity
adroit

**Chapter 7: p. 83-90 "Bellemere"**

Vocabulary: conceded
chandelier
mahogany
perpetually
descent
reverie

**Chapter 8: p. 91-108 "The Club"**

Vocabulary: adrenalin
ulster
querulous
melancholy
decorous
foibles

**Chapter 9: p. 109-121 "The Gulper"**

Vocabulary: fascination
eluding
recede
prudently
supple
resolutely
engrossed
andirons
expostulating

**Chapter 10: p. 122-134 "The Broken Secret"**

Vocabulary: ostentatiously
dormer
stalwart
remorse
extraordinary
spectacle
conjectures
masquerade

**Chapter 11: p. 135-142 "Members"**

Vocabulary: forlorn
condescend
idle
conferred
virtuously

**Chapter 12: p. 143-155 "The Summer Cats"**

Vocabulary: amble
mallet
dilapidated
decorously

**Chapter 13: p. 156-166 "Gone-Away Days"**

Vocabulary: iridescent
radiant
exquisitely

**Chapter 14: p. 167-180 "The Villa Caprice"**

Vocabulary: foliage
contradictorily
festooned
dubious
discordant

stupendous
balustrade

**Chapter 15: p. 181-192 "The Villa Caprice Again"**
Vocabulary: garrulous
jubilantly
agilely
vigilant

# Works Cited

Enright, Elizabeth. Gone-Away Lake. New York: Scholastic, 1957.

WOW! The Wonders of Wetlands. Environmental Concern Inc., 1991.

Internet sources:

"The Animal Kingdom"
http://www.kidport.com/RefLib/Science/Animals/Animals.htm

"Animals of the Wetlands"
http://www.lethsd.ab.ca/mmh/grade5/wetlands/page4.htm

"Aquatic Critters"
http://mbgnet.mobot.org/fresh/slide/intro.htm

"Cattails"
http://www.wildmanstevebrill.com/Plants.Folder/Cattails.html

"How Insects Grow and Change Form"
http://www.uky.edu/Agriculture/Entomology/ythfacts/4h/unit2/hoigr&cf.htm

"How Quicksand Works"
http://www.howstuffworks.com/quicksand.htm

"Wetlands Animals"
http://mbgnet.mobot.org/fresh/wetlands/animals/

# Other Good Resources

Our Vital Wetlands. Tavares, FL: Lake County Water Authority, nd.
Excellent illustrated guide to Florida wetlands wildlife.

Project Wild: K-12 Curriculum and Activity Guide. Council for Environmental Education, 1983.
Almost 500 pages of hands-on activities for all grades.

Viseth, Heather. Wetlands. Mark Twain Media Publishers, 1999.
A good collection of wetlands activities.

Internet resources:

**Wetlands Webquests:**

http://chsweb.lr.k12.nj.us/dscheinberg/Wetlandswebquest/index.htm
Webquest simulating preparation of a traveling exhibit defending wetland

conservation

http://www.tttc.org/projects/EFitzgerald/index.htm
Wetlands Under Attack—Rated 4 stars by Best WebQuests.

http://www.sciencenetlinks.com/lessons.cfm?DocID=79
Managing the Everglades Ecosystem. This WebQuest is designed for grades 9-12, but could easily be adapted for upper elementary grades.

**Wetlands Information:**

**http://www.charttiff.com/WetLandMaps/**
Maps locating wetlands in the 48 contiguous states.

http://mbgnet.mobot.org/fresh/wetlands/animals/
Information and links about all kinds of wetlands wildlife

http://www.howstuffworks.com/quicksand.htm
Information and animation explains how quicksand works (goes with chapter 9 in Gone-Away Lake.)

http://www.twingroves.district96.k12.il.us/Wetlands/Wetlands.html
A virtual wetlands project set up by a middle school in Illinois. Great infor mation.

http://www.dnr.state.wi.us/org/land/er/invasive/factsheets/cattail.htm
Good fact sheet about cattails

http://www.wildmanstevebrill.com/Plants.Folder/Cattails.html
Information about cattails as well as recipes!

http://www.vtaide.com/png/foodchains.htm
Information about food chains

http://www.arcytech.org/java/population/facts_foodchain.html
Information about food chains

http://teacher.scholastic.com/activities/explorer/ecosystems/be_an_explorer/map/form.htm#
Interactive game that teaches about food webs

http://www.sabine.k12.la.us/zes/foodchains/default.htm
Games and information about food chains

**Insects:**

http://www.uen.org/utahlink/activities/view_activity.cgi?activity_id=2024
Insect Metamorphosis: links also contain much information on identification and habits of insects

http://www.caf.wvu.edu/~forage/4002.htm
a good site for information on metamorphosis.

http://www.uky.edu/Agriculture/Entomology/ythfacts/4h/unit2/hoigr&cf.htm
Insect metamorphosis

http://www.enchantedlearning.com/subjects/insects/printouts.shtml
Information, activities, printouts

http://cnnstudentnews.cnn.com/2002/fyi/news/03/04/bugs.classification/
article about insect classification

**Mosquitoes:**

http://whyfiles.org/016skeeter/
Information on mosquitoes and the spread of West Nile virus
http://science.howstuffworks.com/mosquito.htm
Information about mosquitoes
http://www.idph.state.il.us/envhealth/pcmosquitoes.htm
Mosquitoes and encephalitis
http://abcnews.go.com/sections/living/DailyNews/mosquitoes020806.html
Article about mosquitoes and the spread of West Nile virus
http://www.uri.edu/research/eee/tires.html
Technical information about mosquito control

**Arachnids:**

http://www.enchantedlearning.com/subjects/arachnids/Arachnidprintouts.shtml
Information, activities, printouts

http://www.kidport.com/RefLib/Science/Animals/Arachnids.htm
Very basic information, links to other sites

http://www.everythingabout.net/articles/biology/animals/arthropods/arachnids/
Very detailed information on all kinds of arachnids

http://www.sasionline.org/arthzoo/archnids.htm
Great pictures!

http://www.abcteach.com/directory/theme_units/animals/spiders/
Worksheets and activities dealing with spiders

**Centipedes and Millipedes:**

http://lancaster.unl.edu/enviro/pest/factsheets/012-93.htm
Excellent informational site on centipedes and millipedes from the Univer sity of Nebraska

http://ohioline.osu.edu/hyg-fact/2000/2067.html
Information on centipedes from Ohio State University

http://www.gplatt.demon.co.uk/centiped.htm
Close-up pictures of centipedes

http://www.earthlife.net/insects/chilopod.html
Detailed information about centipedes and many of their relatives

**Lesson Plans:**

http://sln.fi.edu/tfi/units/life/classify/classify.html
Links to plans for a variety of hands-on lessons

http://www.earthlife.net/insects/classtax.html
Insect classification lesson plans

http://www.successlink.org/great/g992.html
Insect classification lesson plans

http://www.nbii.gov/education/insects.html
Links to a variety of lesson plans on many science subjects

**Vertebrates:**

http://falcon.jmu.edu/~ramseyil/vertebrates.htm
Information on classifying vertebrates; links to lots of other informational sites.

http://oswego.org/staff/jburger/inspiration/
Interactive lesson on classifying vertebrates

http://www.kidport.com/RefLib/Science/Animals/Animals.htm
Information for kids on all kinds of animals

http://www.lethsd.ab.ca/mmh/grade5/wetlands/page4.htm
Information and links about all kinds of wetlands wildlife

http://mbgnet.mobot.org/fresh/wetlands/animals/
Information and pictures of wetlands animals

Algae

http://www.nmnh.si.edu/botany/projects/algae/AlgIntro.htm
Information, pictures, and links on algae

http://megasun.bch.umontreal.ca/protists/gallery.html
Great pictures—useful for identifying microscope images

http://mbgnet.mobot.org/fresh/lakes/algae.htm
Information on algae

# A Field Guide to Wetlands

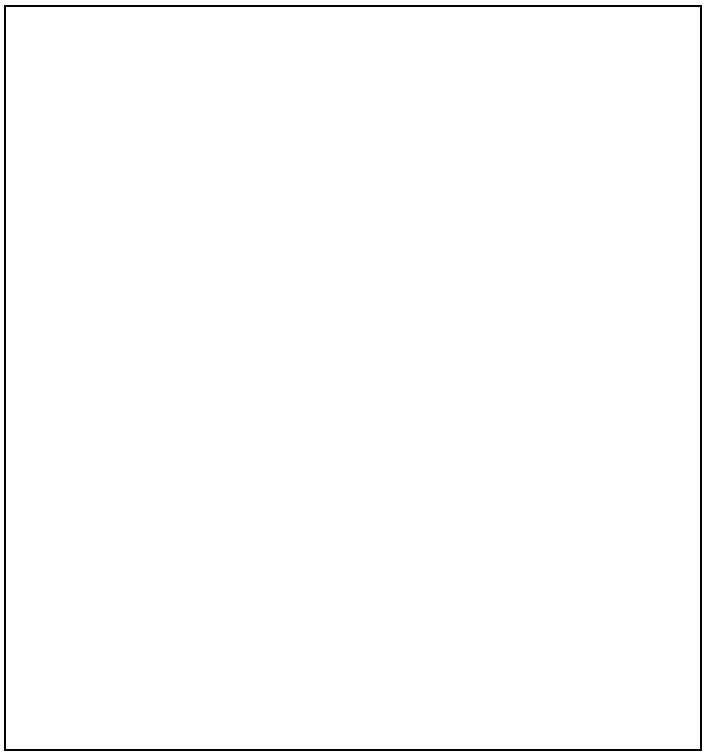
Common Name: _____

Scientific Name: _____

Description: _____

_____

Where found: _____



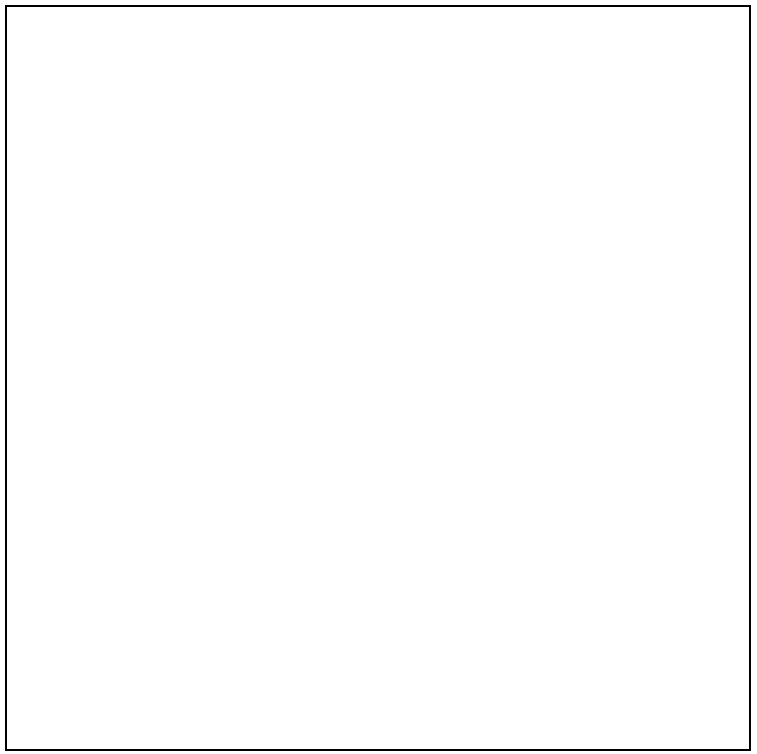
Common Name: _____

Scientific Name: _____

Description: _____

_____

Where found: _____



Common Name: _____

Scientific Name: _____

Description: _____

_____

Where found: _____

# Wetlands

# Trip Record

**Book 1**

Name _____

**Additional Notes**

## Study Trip Procedures

1. Stay with your group and chaperone at all times.

2. Follow all instructions given by your teacher or by the guide.

3. Use your lifeskill of active listening when the guide or teacher is talking.

4. Do your personal best as you fill out this book.

5. Be sure to thank your driver and guide.



## Notes

## Vocabulary

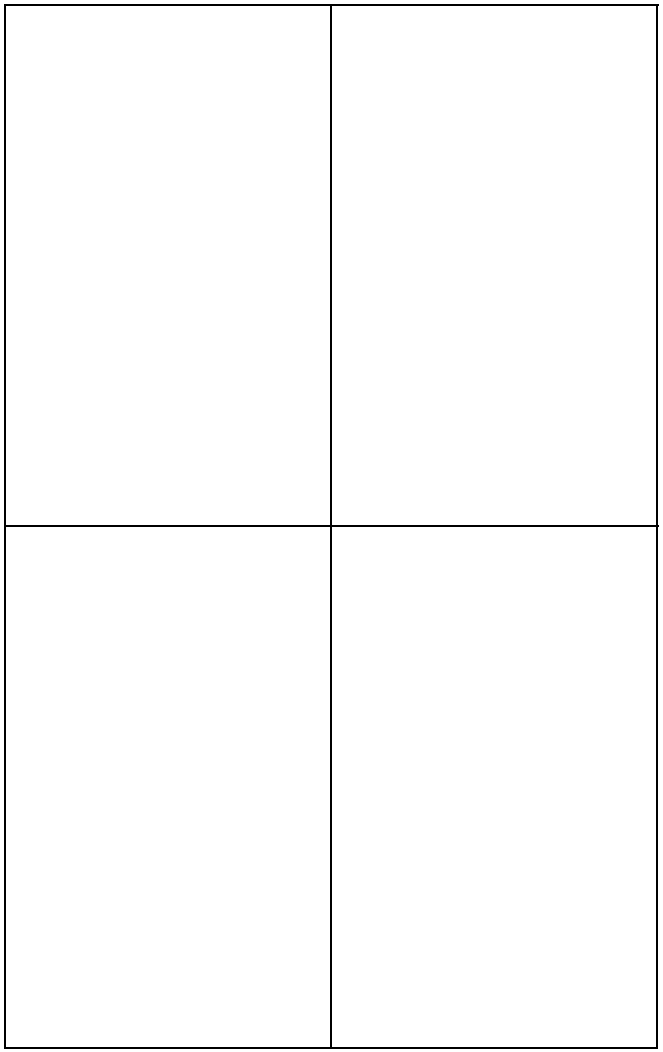
On the lines below, write down new words or terms with their meanings.

On the next pages, draw pictures of interesting plants or animals you see in the wetlands. If you can identify them, write their names in the box, too.



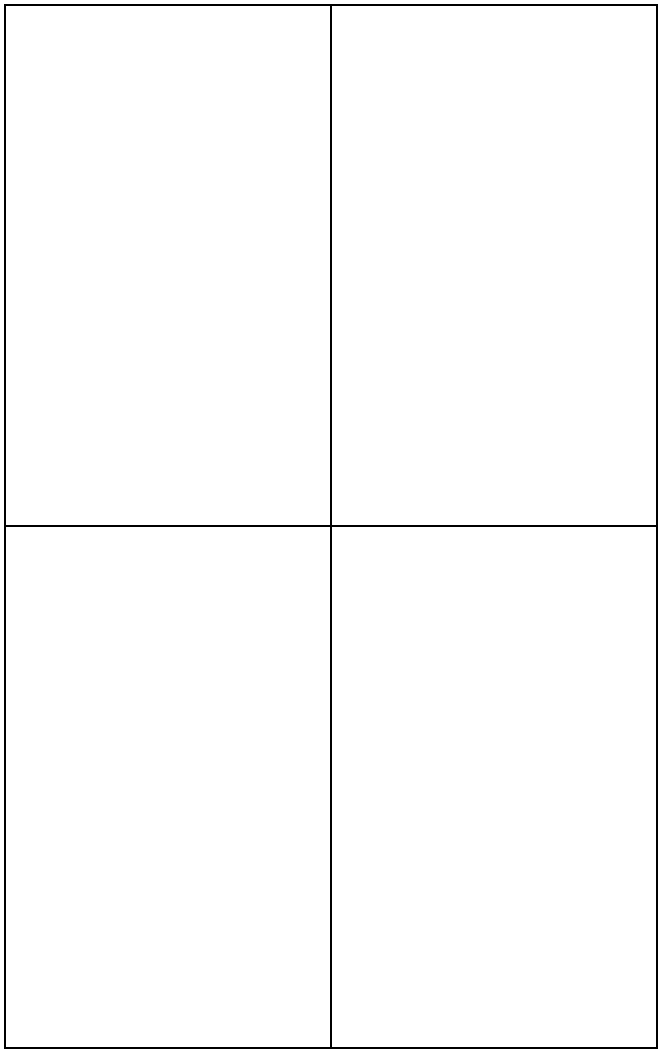
## Plant Life

**Animal Life**



4

**Plant or Animal Life**



5

# Wetlands

# Trip Record

**Book 2**

Name_____

**Notes**

## Study Trip Procedures

1 Stay with your group and chaperone at all times.

2. Follow all instructions given by your teacher or by the guide.

3. Use your lifeskill of active listening when the guide or teacher is talking.

4. Do your personal best as you fill out this book.

5. Be sure to thank your driver and guide.



## Collecting Samples

You will need to collect some samples of water to take back to school for further study. Follow your teacher's directions for collecting and storing water samples.

You will also need samples of "pond scum" or algae. Again, follow your teacher's instructions carefully. You do not want the sample to dry out before you study them.

## A Square Foot of Wetland

You will be given a piece of string or yarn 4 feet long. Tie it so it forms a loop or square.

Place your square on the ground in the wetlands. You may not be within 4 feet of any of your classmates. Be sure to follow your teacher's instructions regarding how far from the trail you may go.

Do not touch anything in your square. You are here only to observe.

On the following pages, record **everything** you observe in your square over the next 5 minutes. If you see more than one specimen of any living thing, record how many you see.

Be sure to keep this record. You will need it for a later activity.



## Categories

How many examples of each of these have you seen today? Draw small pictures or write brief descriptions to help you identify any specimens whose names you do not know.

Plants:

Insects:

Arachnids: