

LESSON PLAN:

Who Lives in the Marsh?

OVERVIEW:

The New York State Canal System includes many types of waterbodies. Not only are there canals, but also rivers, lakes, streams, and wetlands. These waterways are critically important for people and wildlife. In this lesson, students will learn about the unique adaptations of wetland plants and animals. Through a clue-based game, students will discover how organisms survive in wetland habitats.

Grade Level: 4 to 6

Class Periods: One 45-minute class period

OBJECTIVES:

- Students will understand what adaptations are and why they matter.
- Students will be able to recognize characteristics of wetland plants and animals.
- Students will be able to explain how adaptations help organisms survive in wetlands.

MATERIALS NEEDED:

- Wetland Clue Cards (one set per group).
Print enough group sets before the lesson
- Pencils and scrap paper
- Pictures of organisms (optional)
- Index cards for creating new clues

VOCABULARY:

- **Adaptation:** Something a living thing has or does that helps it better survive in its environment.
- **Biodiversity:** The variety of life on Earth, or in a particular habitat or ecosystem.
- **Ecosystem:** A community of living things and their environment working as a unit.
- **Hibernate:** A period of lower physical activity and slowing body systems, similar to sleep, that some animals go in to during winter.
- **Wetland:** Land covered with water all or part of the year; nature's sponge.



BACKGROUND

NEW YORK STATE EDUCATION STANDARDS:

3-LS4-3:	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all
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Teacher Procedure

► WARM-UP DISCUSSION (10 MINUTES):

1. Ask students to define **adaptation** in their own words. Record their responses as they share them.
2. Discuss together how people adapt or change in everyday life based on the environment. For example, talk about how weather affects the clothes we wear, the activities we choose, and how we care for our bodies (like drinking more water on hot days or wearing extra layers when it's cold).
3. Adaptations are special features or behaviors that help plants and animals survive in their habitats. These changes can be physical (like thick fur) or behaviors (like migrating to warmer areas). Without adaptations, species would struggle to meet their basic needs.
4. All living things require:
 - **Food:** Provides energy for growth, movement, and life functions. Plants make food through photosynthesis, while animals get energy by eating other organisms.
 - **Water:** Essential for transporting nutrients and supporting cellular processes.
 - **Air:** Animals need oxygen to breathe; plants need carbon dioxide for photosynthesis.
 - **Shelter:** Protects from weather, predators, and provides resources.
 - **Space:** Allows organisms to grow, find food, and live without overcrowding.
5. Because plants and animals share habitats, they often compete for food, water, shelter, and space. Over time, species have developed adaptations that help them survive and find the resources they need. Examples of adaptations:
 - **Cold Environments:** Polar Bears and Whales have thick fur or blubber to stay warm. The Wood Frog has an extreme adaptation—it can survive freezing temperatures by allowing much of its body to freeze solid in winter.
 - **Hot vs. Cold Habitats:** Elephants are adapted for warm, dry environments, while Polar Bears are adapted for cold ones. Each would struggle to survive in the other's habitat.
 - **Sharing the Same Habitat:** Giraffes and Elephants both live in warm, dry areas but avoid competition by eating different parts of plants. Giraffes use their long necks to reach treetops, while Elephants use trunks and tusks to feed closer to the ground.
6. Not all wetlands are the same. There are several main types, including:
 - **Marshes:** Covered with water part or all of the time, filled with grasses and non-woody plants.
 - **Swamps:** Wetlands with trees and shrubs, often fed by rivers and floods.
 - **Bogs:** Rain-fed wetlands with spongy moss floors, usually found in northern regions.
 - **Fens:** Groundwater-fed wetlands with grasses, reeds, and wildflowers, less acidic than bogs.

SECTION 1: TEACHER PROCEDURE

7. Biodiversity means the variety of life on Earth, or in a particular habitat or ecosystem. Wetlands are biodiversity hotspots because they provide food, shelter, and breeding grounds for countless species. In New York the Montezuma Wetlands Complex provides a good example of the variety of life found in wetland habitats. Wildlife found in Montezuma include:
- More than 240 species of birds, including geese, ducks, wading birds, songbirds, and raptors
 - 43 species of mammals, including deer, muskrats, beavers, weasels, and mice
 - 15 species of reptiles, including turtles and snakes
 - 16 species of amphibians, including frogs and salamanders

► **ACTIVITY: WETLAND CLUE GAME (30 MINUTES):**

1. Explain to students that they will be playing a game to learn about types of plants and animals found in Montezuma Wetlands Complex. Display or hand out "Animals and Plants in New York's Wetlands" as a guide.
2. Divide students into groups of 3–4.
3. Give each group a set of clue cards that were printed before the lesson.
4. Explain rules:
 - a. Each card has 4 clues about a wetland organism found in New York State.
 - b. The reader reveals clues one at a time until someone guesses the organism and its habitat.
 - c. Scoring:
 - i. 1 clue = 4 points
 - ii. 2 clues = 3 points
 - iii. 3 clues = 2 points
 - iv. 4 clues = 1 point
 - d. Rotate readers after each card.
 - e. Continue until all cards are read.
 - f. Record your score for each clue on the score sheet. Tally your scores at the end of the game to determine the group's winner.

► **EXTENSION ACTIVITY (15 MINUTES):**

1. Each student researches and creates two new clue cards for plants or animals found in Montezuma Wetlands.
2. Students can use iNaturalist to discover plants and animals which have been photographed in Montezuma. <https://www.inaturalist.org/places/montezuma-national-wildlife-refuge#/places/montezuma-national-wildlife-refuge=>
3. Groups play again using their new cards.



SECTION 1: TEACHER PROCEDURE

► **WRAP UP DISCUSSION (5 MINUTES):**

1. How do adaptations help organisms find food or avoid predators?
 2. Why is biodiversity important in wetlands?
 3. What might happen if wetlands disappear?
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► **OPTIONAL HOMEWORK ACTIVITY:**

Design a new wetland organism with unique adaptations. Draw or collage the organism in its habitat and describe its survival strategies.

Attachments





NAME _____

Wetland Clue Game

► RULES

1. Each card has 4 clues about a wetland organism found in New York State.
2. The reader reveals clues one at a time until someone guesses the organism and its habitat. Each group member gets 1 guess per clue. If no one guesses correctly, the reader moves on to the next clue.
3. Scoring: If the answer is guessed on
1 clue = 4 points
2 clues = 3 points
3 clues = 2 points
4 clues = 1 point
4. Rotate readers after each card.
5. Continue until all cards are read.
6. Record your score for each clue on the score sheet. Tally your scores at the end of the game to determine the group's winner.



NAME _____

Wetland Clue Game Scoresheet

Card 1 _____ points

Card 2 _____ points

Card 3 _____ points

Card 4 _____ points

Card 5 _____ points

Card 6 _____ points

Card 7 _____ points

Card 8 _____ points

Card 9 _____ points

Card 10 _____ points

Card 11 _____ points

Card 12 _____ points

TOTAL _____ **points**



► CARD 1: BEAVER

CLUES:

- I have thick, oily fur that keeps me dry. My back feet are webbed like flippers, and my ears and nose can close underwater.
- I push green branches into the mud to save them for food in winter.
- I use my wide, flat tail to help me swim. I also slap it on the water to warn others of danger.
- I build my home from sticks and mud in the water, with an entrance below the surface.

ANSWER:

Beaver – lives in streams, ponds, and rivers



► CARD 2: SKUNK CABBAGE

CLUES:

- I grow in swamps and am known for my smell.
- I share my name with a mammal, also known for making a strong odor.
- I can turn energy into heat, so I can melt any snow around me and start my spring growth even when temperatures are still below freezing.
- My strong smell helps attract flies and beetles. These insects carry my pollen from flower to flower. We depend on each other in late winter—I give them food and they help my flowers grow.

ANSWER:

Skunk Cabbage – found in shady swamps throughout North America



► **CARD 3: CATTAIL**

CLUES:

- I have long, narrow leaves that bend in the wind without breaking.
- I often grow in thick groups. This gives food and shelter to many animals.
- Long ago, Indigenous Americans used me in many ways. They ate parts of me, wove my leaves into mats and baskets, and used my fluffy seeds in pillows and coats.
- I can grow in shallow water, on floating plant mats, or in wet soil.

ANSWER:

Cattail – the dominant plant in many freshwater marshes, swamps, and bogs



► **CARD 4: OSPREY**

CLUES:

- I am very good at catching fish. I dive from high in the sky and grab them with my sharp claws. Special pads on my toes help me hold onto my slippery catch.
- I have brown and white feathers and a dark stripe near my eyes. When I fly, my wings form an "M" shape.
- People call me the "Fish Hawk" because I mostly eat fish.
- I travel very far each year. I spend the summer in North America and I fly to warm places in Central and South America for the winter.

ANSWER:

Osprey – found near open water with an abundant supply of fish

► **CARD 5: SNAPPING TURTLE**

CLUES:

- I am sometimes called a living dinosaur because my kind has existed for about 90 million years.
- I got my name because I have a very strong bite. Watch out! I may try to nip you if you pick me up. I've even been known to snap off a finger from people who try.
- I spend most of my life underwater, where I am calm. I can act more aggressively when I come onto land to lay my eggs.
- Once I am fully grown, there are very few animals that try to hunt me.

ANSWER:

Common Snapping Turtle – across the eastern United States in almost any permanent or semi-permanent body of water

► **CARD 6: MALLARD**

CLUES:

- I usually eat small aquatic plants, but you may have seen people feeding me small pieces of bread. This has almost no nutritional value and makes it hard for me to fly. I much prefer corn and peas!
- Males and females have very different colors, which makes it easy to tell us apart.
- I am a "Dabbler." I feed while on the water's surface, sometimes tipping my body head-first into shallow water, with my tail pointed straight up.
- After laying eggs and raising young, I shed my flight feathers all at once. This makes it impossible for me to fly for several weeks until new feathers grow back.

ANSWER:

Mallard – found in all waterways throughout North America and Eurasia



► **CARD 7: SUNDEW**

CLUES:

- My leaves are covered in tiny, hair-like arms with sticky drops on the tips that shine in the sun. These sticky drops give me my name.
- The wet soil where I grow does not have many nutrients, so I catch and eat insects with my sticky drops!
- I grow my flowers on tall stalks, keeping them well away from my sticky leaves to prevent pollinators from being trapped and eaten.
- In the winter, I make a special protective cover and go into a resting state to survive the cold. This rest is similar to hibernation.

ANSWER:

Sundew – found in bogs



► **CARD 8: SANDHILL CRANE**

CLUES:

- Sometimes I dance wildly on long, stilt-like legs, especially during courtship.
- I have a long windpipe that helps me make loud, trumpeting calls that can be heard from far away.
- My babies can leave the nest just 8 hours after they hatch and can even swim. They stay with their parents for about 9 to 10 months.
- Unlike the Great Blue Heron, which flies with its neck tucked in, I fly with my neck straight out.

ANSWER:

Sandhill Crane – open wetlands like marshes, bogs, wet meadows, and prairies



► **CARD 9: DRAGONFLY**

CLUES:

- You might be surprised that I live in the water for most of my life.
- I can fly forwards, backwards, hover in place. I can also turn quickly because I can move all four of my wings.
- I am a great hunter and catch my food almost every time I try.
- Fossils show that millions of years ago I had a wingspan up to two feet wide! Today, my wings are much smaller, just 2-5 inches wide.

ANSWER:

Dragonfly – freshwater ponds and streams



► **CARD 10: NORTH AMERICAN RIVER OTTER**

CLUES:

- I have a long body, short legs, and a long, strong tail. These help me swim well.
- My feet are webbed and my nose and ears can close when I go underwater. My thick, water-resistant fur keeps me warm and dry.
- A long time ago, many of my kind were trapped, and we lost places to live, so our numbers went down. Now we are coming back and can be seen in many parts of New York, especially near rivers and lakes.
- I am playful and active and am often seen with my family.

ANSWER:

North American River Otter – freshwater rivers, lakes, and wetlands



► **CARD 11:** _____

CLUES:

1. _____

2. _____

3. _____

4. _____

ANSWER: _____



► **CARD 12:** _____

CLUES:

1. _____

2. _____

3. _____

4. _____

ANSWER: _____



NAME _____

► **DESIGN A NEW WETLAND ORGANISM
WITH UNIQUE ADAPTATIONS**

Draw or collage the organism in its habitat and describe its survival strategies.

NAME _____

► **ANIMALS & PLANTS IN NEW YORK'S WETLANDS:**

Mammals



1. Beaver



2. Raccoon



3. North American River Otter



4. Muskrats

NAME _____

► **ANIMALS & PLANTS IN NEW YORK'S WETLANDS:**

Birds



1. Osprey



2. Mallard



3. Sandhill Crane



4. Bald Eagle

NAME _____

► **ANIMALS & PLANTS IN NEW YORK'S WETLANDS:**

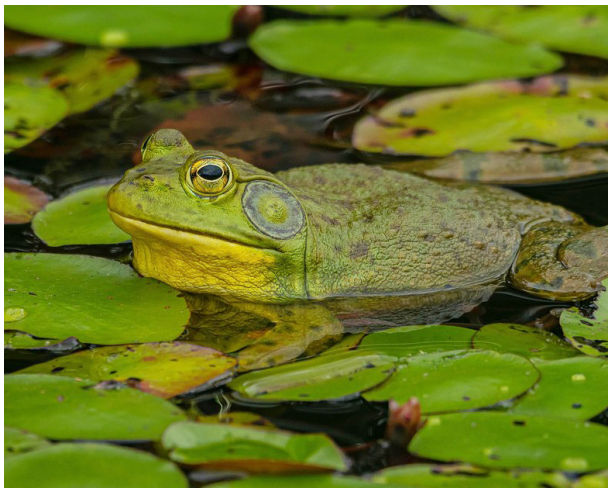
Reptiles & Amphibians



1. Snapping Turtle



2. Northern Water Snake



3. American Bullfrog



4. Spotted Salamander

NAME _____

► **ANIMALS & PLANTS IN NEW YORK'S WETLANDS:**

Insects



1. Dragonfly



2. Monarch Butterfly



3. Honey Bee



4. Grasshopper

NAME _____

► **ANIMALS & PLANTS IN NEW YORK'S WETLANDS:**

Plants



1. Skunk Cabbage



2. Cattail



3. Sundew



4. Red Trillium