



**Western Upper Peninsula Center
for Science, Mathematics and Environmental Education**

A partnership of

Copper Country & Gogebic-Ontonagon Intermediate School Districts and Michigan Technological University
Serving schools and communities in Houghton, Baraga, Gogebic, Ontonagon and Keweenaw Counties

Frog-tastic

Age Group: Gr. 2

Summary : Students will participate in a variety of frog activities followed by a frog search and careful observation of discoveries. Students will describe the basic requirements, adaptations, and life cycle of frogs.

Sources Consulted:

1. Lingelbach, Jenepher. Hands-On Nature. Vermont Institute of Science. Woodstock, Vt. 1986, 2000. P.58-63.
2. Harding, Jim and J. Alan Holman. 1992. Michigan Frogs, Toads and Salamanders. Michigan State University Extension.

Objectives:

After this presentation, students will be able to:

1. List indicators of spring.
2. Explain what causes spring “firsts” in nature.
3. Explain why frogs call in the spring?
4. Explain why frogs (and other animals & insects) go through metamorphosis?
5. Describe 4 stages of frog life cycle.
6. List 5 ways that tadpoles are different from frogs.
7. Explain why frogs are beneficial?
8. Describe habitat for adult and tadpole stages of frog.

Standards: SCI: I.1.E3; II.1.E4; III.2.E1-4; III.4.E2; III.5.E1-2.; SOC: I.2.E2.

Materials Needed

<p><i>Part I: Frog Ecology & Behavior Games</i></p> <p>Frog metamorphosis poster Laminated poster of Michigan Frogs & Toads Frog pictures (matching game) Frog shakers (film canisters) Frog calling materials (rocks, balloons, combs, jingling bells, rubber band/cups) Laminated poster of EPA’s <i>Eat or Be Eaten at the Wetland Café</i></p>	<p><i>Part II - Pond sampling equipment</i></p> <p>Plastic gallon milk jugs White tubs Ice cube trays Small green aquarium nets Pond ID sheet “What’s in the Pond” data sheets Clipboards Pencils Plastic spoons Large nets (optional)</p>
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Part I – Frog Ecology & Behavior (45-60 minutes)

5 min- INTRODUCTION: Spring is a time of “firsts.” It is a time of birth and change....

Let’s list some “firsts” in spring:

- First bird singing
- See first bird - robin
- First frog calling
- First thunderstorm
- First bumble bee
- First mosquito
- Ice melts off lakes
- First flower
- First butterfly
- First leaf (swelling of buds)

“Firsts” are determined by: air temp, water temp, and day length (amount of sun)

Hearing frogs are a common spring event. Today---we are going to learn more about FROGS--- why and when they call, what their calls sound like, why frogs go through metamorphosis, how tadpoles are different from frogs, and explore what lives in a pond along with the tadpoles and frogs.

There are 11 species (or different kinds) of frogs in UP (13 statewide in Michigan) – show poster of Michigan Frogs & Toads.

Why do frogs call? (why do birds sing?)

- To attract a mate
- Warn away other males from their breeding site
- Warn of danger

ACTIVITY #1: Frog mating game – by sight (5 min)

Students are given a laminated frog card and must find each other by sight. **Q:** Is that how male frogs really find female frogs? No!

ACTIVITY#2: Frog mating game – by sound. (10 min)

Using film canisters (each pair of film canisters is filled with a variety of materials, such as paper clips, sand, pebbles, beans, etc.), students must find their partner who has a canister with the same sound. **Q:** Do all frog species sound the same? *No!* How do breeding frogs find a mate? *By sound.*

ACTIVITY #3: Frog chorus to simulate timing of frog breeding calls. (5 min)

Assign groups of 3-4 students to be the various species of frogs. Teach them their “call” using the props provided (rocks, balloons, etc.). See the Frog Calling Calendar & Frog Call of the UP. Arrange students in a circle. You will be the “conductor” telling each species when to begin and end their calling. **Q:** What do you observe about the calling of frogs---do they all call at once in the spring? *No!* Do they all call for the same period of time? *No, wood frogs call for the shortest period and spring peepers call for the longest period.*

ACTIVITY #4: Students act out Life Stages from egg to tadpole to adult frog. (12 min)

Overview of Frog Life Cycle

- Egg (hatch in few days or weeks, depending upon temperature & species)
- Tadpole (for weeks, months or entire year)
- **BIG CHANGE = Metamorphosis**
- Froglet
- Adult frog

Merry Metamorphosis Activity

1. Students huddle together as an egg mass.
2. Group begins to separate as eggs hatch.
3. Each student moves about alone with feet together and hands at their side.
4. Legs start to grow – students now shake both legs and begin moving with legs apart, hands still at their sides.
5. Front legs appear – students wiggle arms from elbows down, upper arms still touching sides.
6. With big eyes bulging out and now breathing with lungs, students gather at edge of pond.
7. Metamorphosis is complete! The little froglets hop out of the pond.

Why metamorphosis?

Metamorphosis is the change that takes place inside and outside of an animal or insect. These changes happen for one important reason—to prepare it for a change in *where and how* it lives. Metamorphosis = double life. Metamorphosis allows larvae and adults to live in different places and eat different things, so that they *don't compete* with each other for living space, shelter, or food. Compare to human children & adults. Do we go through metamorphosis? *No!* Chemicals (hormones) in body trigger metamorphosis.

ACTIVITY #5: Frog or Tadpole? (10 min)

Divide students into two groups: tadpoles and frogs. Each group has to raise their hands first when a card showing a characteristic (see lists below) of their stage is held up by the instructor.

Characteristics of Tadpoles

1. Swim like fish using tail to move through water; no legs.
2. Have gills to breathe oxygen in water
3. Fish-like mouth opening
4. Feed on algae and plant life

Characteristics of Frog

1. Mouth changes from fish-like opening to mouth with tongue
2. Have lungs that breathe oxygen out of air
3. Digestive systems changes to eat insects and small animals
4. Tail is absorbed (used for energy, while mouth is sealed shut as it metamorphoses)
5. First hind legs then front legs appear that allow them to move on land by hopping or leaping---no longer restricted to only living in water.

Neither group: furry, wings, 8 legs, breathes fire, etc.

ACTIVITY #6: Play *Moving Meals* (just like Red Light, Green Light!) (5 min)

Assign two students to be frogs and position them at one end of the pond. The other students are mosquitoes and other insects that have to fly across the pond without getting eaten by the adult frogs. Students love the running and excitement of this game.

Benefits of Frogs

- **Provide food for other animals!!** Many frog eggs, tadpoles, froglets and frogs become food for other animals (Birds, snakes, herons, other frogs, aquatic insects, etc.).
- **EAT insects – 4800 per year!**

Part II – Pond sampling (45-60 minutes)

Let's find out what lives in this pond with the frogs. Do any of these other organisms go through metamorphosis like frogs? Who eats whom? Review pond sampling rules.

ACTIVITY #1: Put students into groups of three. Hand out Food Chain cards. Ask students to arrange themselves into: plant --- herbivore/plant-eater --- carnivore/meat-eater

ACTIVITY #2: Hand out metamorphosis cards. Ask students to find their partners:
larval or young stage --- adult

ACTIVITY #3: Organize into groups with one adult per group. Distribute equipment amongst groups. Demonstrate how to properly collect aquatic organisms. Tell student that each must draw one organism that they find on the form on the clipboard, then give clipboard and pencil to next child.

ACTIVITY #4: If there is time, have students bring one organism that they collected in a small plastic container. Have them arrange them into a food chain:
plant --- herbivore --- carnivore

Frog Race Against Time – spring peepers hatch in 3 days and tadpoles become frogs in 6-8 weeks in a race against time---- their vernal pond may dry up! Benefit of breeding in a vernal pond – no fish or other large predators and warmer water. While green and bullfrogs can take 2-3 years to mature from tadpole to adult to frog, so require permanent water found in lakes and large ponds.

Benefits of Frogs

- One important role of frogs in nature is providing food for other animals!! Many frog eggs, tadpoles, froglets and frogs become food for other animals. (Birds, snakes, herons, other frogs, aquatic insects, etc.)
- **EAT insects – 4800 per year!**

Why is it important to protect frog habitat (= shelter, water, food, space)? So we can protect frogs.

Summary: (review of objectives)

1. What are some signs of spring?
2. What causes spring? (changing day length & warmer temps).
3. Why do frogs call in the spring?
4. What is metamorphosis? Why do frogs (and other animals & insects) go through metamorphosis?
5. Describe 4 stages of frog life cycle.
6. List 5 ways that tadpoles are different from frogs.
7. Explain why frogs are beneficial.
8. Describe habitat for adult and tadpole stages of frog.

Pond Sampling Rules

1. This pond is home to lots of animals.

Treat the pond the way you'd want a stranger to treat your special place. Don't walk in it! It makes the water all murky— hard for us to see critters and hard for them to see their food.

2. This pond is a nursery for young animals.

Be careful with the animals that you collect so you don't injure them.

- *Don't handle them with your hands.*
- *Put all animals back in the water when you are through.*

3. These animals need water.

All collected animals must be placed in a container with water ASAP.

4. Be careful of equipment.