

FROG WATCH Activity (Grades 1–8)

Objectives:

Students will be able to:

1. List the four essential parts of a habitat: food, water, shelter, and space.
2. Describe the frog food chain—one thing that a frog eats and one animal that eats frogs.
3. Give two examples of environmental changes (air and water pollution, dry weather, filling or paving a wetland, etc.) that can hurt frogs.
4. Explain why frogs are good indicators of environmental health (bioindicators).

Materials Needed:

hard-boiled egg
coke
paper insects (w/ velcro)
green jelly
leather purse
frog poster
coffee filter
party blow-outs
frog song tape

Introduction/Overview

A scientist always starts with a question, not an answer. What would you like to know about frogs? We'll see if we can answer some of those questions by the end of the lesson. (Optional: list questions on blackboard; come back to these at end, see if kids can answer now.)

Michigan Frogs

Michigan has 12 kinds of frogs and toads; 10 in UP (SHOW POSTER). Some types of frogs are not as common as they used to be.

FROGS Tell Us If Our Environment is Healthy

Frogs are amphibians because they live part of their life in water and part of their life on land. Describe the life cycle of a frog: Egg—Tadpole—Mature Frog.

Frogs are very important to us because they tell us how healthy our air, water, and soil are. Frogs are similar to a thermometer that tells us when we have a fever; frogs tell us if there is pollution in the environment.

Demonstrate: Why are frogs good indicators of environmental health (*Bio-Indicators*)?

- 1) **Lay soft, jellylike eggs in water** that is much less protected than birds' eggs or reptiles' eggs. Show chicken egg and frog egg (jelly floating in water). Ask: "Which egg would be more sensitive to water pollution?"
- 2) **Have thin, moist, permeable skin.** "Which one is tougher— a LEATHER (cow skin) or FROG SKIN (coffee filter)? Permeable means that things such as water, chemicals, food, etc. can pass through the skin). Hold up coffee filter, pour clean water through it; have students watch what comes out the bottom. Then pour coke through the filter. Tell students, "This is like the frog's skin. What is it absorbing now?" Repeat with leather.
- 3) **Different species require different habitats, and frogs live in both water and on land.** (Show frog pictures on DNR poster) Bullfrogs are very large, as big as a fist! Bullfrogs and green frogs require a whole year to grow from a tadpole into a frog. Bullfrogs need a permanent lake or pond for breeding. Spring peeper are very small— the size of my baby fingernail. Peepers require only 6–8 weeks to grow from a tadpole into a frog. Peepers can breed in small puddles or ponds (vernal pools), as long as they don't dry up before the tadpoles mature into frogs.

FROG SURVIVAL GAME or Disappearing Frog Game

Each participant is a frog. What do frogs need to survive—this is called habitat.

The four characteristics of habitat are:

Food: How do frogs get their food? They use their tongue to catch mosquitoes, flies, fish, birds, water insects (algae and aquatic plants at tadpole stage)

Water: Clean water for breeding, keeping skin moist, wintering over.

Shelter: Places to hide from predators, i.e. burrow into mud, lily pads, grasses)

Space: Only a certain density of frogs per pond, need travel corridors between breeding sites and living areas in the forest).

Materials Needed:

- Cut 8 1/2 sheets of paper, cut into approx. 3"x3" squares. Plan on 6 squares of each color per participant. Mark specific colors with "D," "P," "T," or "X."

FOOD

orange cards
(mark 1/2 with D)

WATER

blue cards
(mark 1/2 with P)

SHELTER

yellow cards
(mark 1/2 with T)

SPACE/ARRANGEMENT

green cards
(mark 1/2 with X)

Party favor blow-outs with small piece of velcro attached to end; one per participant.

Directions:

Give each student a party favor (blow-out) with velcro on the end (optional – perhaps students can help you make these). Spread out colored cards on blanket or table top, velcro side up (if using velcro). Tell the students, "Each of you is a frog. Frogs don't use their legs to capture food, so you cannot use your hands. Use the party favor (with velcro on the end) to capture as many bugs as you can. Remember, frogs need to eat a lot of bugs to survive, so catch as many bugs as quickly as you can." Allow 3–5 minutes for students to catch bugs. After all the cards are taken, ask why some cards are left over. (Those bugs got away.) Have students sit in a circle.

EACH FROG MUST HAVE AT LEAST 5 BUG CARDS TO SURVIVE!! (If not, have the player step into the middle of the circle and sit down.)

Turn Orange Food cards over. "Every one with an orange card, stand up! If your orange card has a D you've just become someone else's dinner! What eats frogs? (muskrat, heron, snake, fish, turtles, humans, hawks, minks, and otters.) **(Have them step into the middle of the circle and sit down.)**

Turn Green Space Cards over. "Green stands for the space you need! If your green card has a X, your puddle was filled in by someone wanting to build a house or shopping center there. **(Have them step into the middle of the circle and sit down.)**

Turn Blue Water Cards over. "Blue is the water you need. If your blue card had a P; P is for Pollution—what pollutants might affect frogs? Fertilizers, pesticides (to kill insects), toxic chemicals, acid rain.... **(Have them step into the middle of the circle and sit down.)**

Turn Yellow Space Cards over. "Yellow is the shelter that you need. If your yellow card had a T; T means that the tree or bush shading your pond was cut down and all of the water dried up before you could go from the tadpole stage to the adult frog stage..... **(Have them step into the middle of the circle and sit down.)**

Ask the remaining students which students got at least one card of each color— orange, green, yellow, blue, AND at least five cards with insects? Tell students, "If you are missing any one of these colors, you've croaked. You just disappeared." Have them step out from the circle. The remaining frogs SURVIVED!! "How many of you got lucky and survived?" Ask them again what frogs need to survive—food, water, shelter, and space in a certain arrangement.

SUMMARIZE—WHY DID SOME FROGS DIE?

- Habitat loss due to new house or shopping center in their home pond.
- Poisons/pollution in the environment got into their pond water.
- Got eaten by other animals (predators).
- Shade trees and bushes next to pond were cut down.

SUMMARIZE—WHY ARE FROGS IMPORTANT?

1. Frogs are part of the food chain.

2. Frogs are natural insecticide— without frogs the insect population would be much greater.

(1 cricket frog = 4800 bugs/year). How many bugs could 100 frogs eat?

3. Frogs are sensitive to pollution (bioindicators) — their thin permeable skin is sensitive to poor water and air quality that would also affect humans— may be first warning sign for humans.

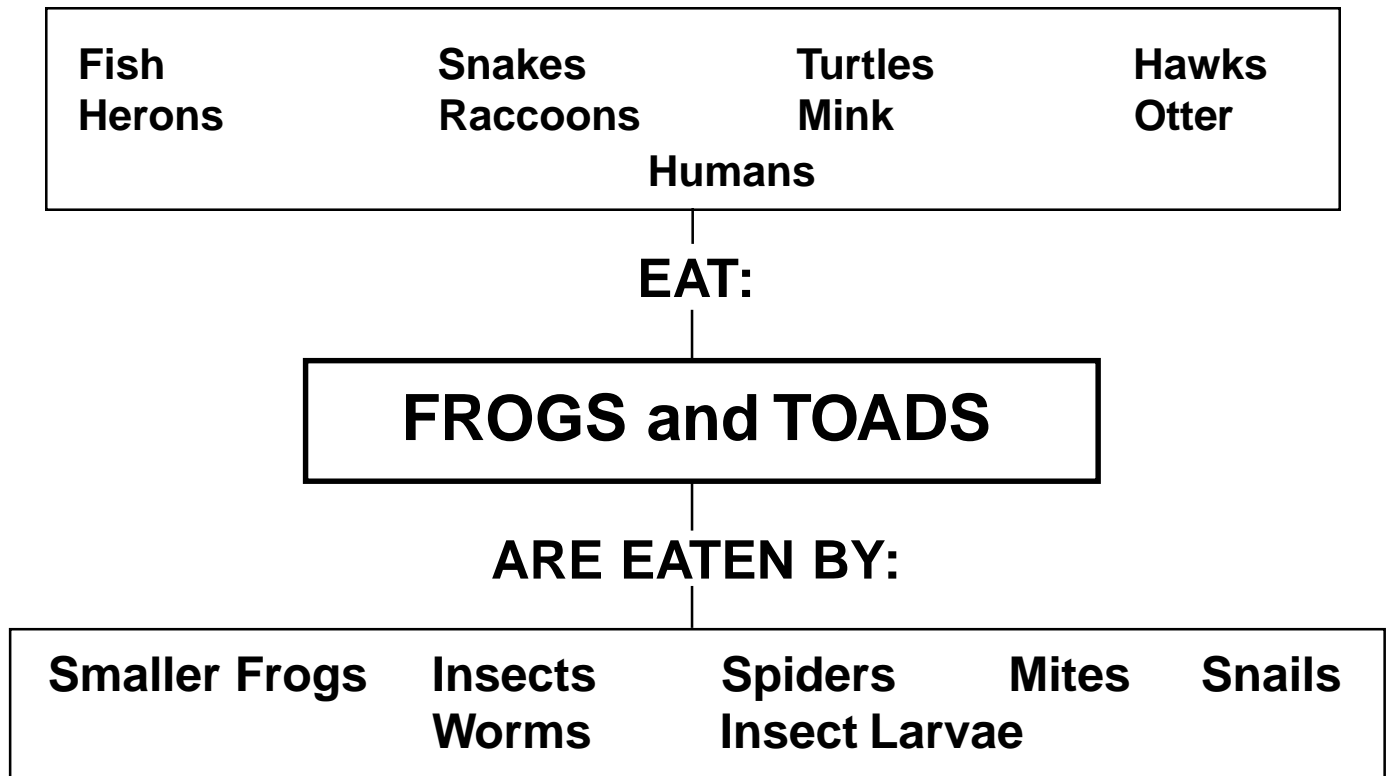
Optional Activities

1. Make a *Frog Food Chain mobile*—use animal pictures, construction paper, markers, glue, and yarn.

2. Make *Habitat for a Frog*: use clay, stickers, styrofoam trays or paper plates, Q-tips, markers, blue paper, glue to create food, space, water, and shelter for a frog.

3. *Yikes— A Frog Just Ate You!!* Game played like Red Light, Green Light. Running kids are insects. Put two frogs at one end. They yell dinner and turn around. Any insects (kids) that are moving, get “eaten” and are out of the game. (*Frogs only eat moving insects, not still ones!*)

FROG FOOD CHAIN



Bull Frogs/Green Frogs: crayfish, fish, mice, birds, turtles

One Cricket Frog: eats 4,800 insects each year.

One Toad: eats 3,200 insects each year.

Effects of pH Changes on Aquatic Plants and Animals

pH Ranges that Support Aquatic Life

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Bacteria: 1.5_____13.5

Plants: 6.5_____12.0

Carp,suckers,catfish: 6.0_____9.0

Bass, crappies: 6.5____8.5

Snails, clams, mussels: 7.5__9.0

Trout, frogs, aquatic invertebrates: 6.5_7.5

(most mayfly, stonefly, and caddisfly nymphs; tadpoles)

pH Scale:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
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Directions: Measure the pH of the liquids listed below. First guess (hypothesize), then test. On the pH scale above, write in the name of each liquid tested next to its pH value.

Household Liquids	My Guess	pH Test

Could trout or frogs live in these liquids? Explain.