

# Frogs and How They Live

## Synopsis

The frog in nature is perhaps even more wonderful than the creature from children's stories and fairy tales.

Frogs are amphibious, living on both land and in water. Other amphibians include toads, salamanders and newts. Frogs are cold-blooded and must protect themselves from extreme cold or extreme heat by hibernating in the winter or estivating in the summer. (Humans and other mammals are warm-blooded; their body temperatures remain constant no matter what the weather.) Since the frog has a backbone, it is classified as a vertebrate.

The frog's skin helps it to breathe; to take in moisture; and, in some cases, to hide. Since the frog has many natural enemies, it needs other defense mechanisms in addition to camouflage. Such defenses include the frog's extremely powerful back legs, which allow it to jump many times its own length. The frog's webbed back feet help it to swim. Its sticky tongue can unroll and strike out at insects and other small animals. Its eyes can see a full 360 degrees. A third eyelid, which is transparent, allows the frog to see underwater. Although it appears not to have ears, the frog does have sharp hearing.

Female frogs lay their eggs -- as many as several thousand at a time -- in slippery strips or clumps in the water. Most of the eggs dry out or are eaten by predators. Those that don't, grow into tadpoles or polliwogs. The tadpole develops through stages characterized in turn by external gills, internal gills,

and finally lungs. This process, called metamorphosis, takes place over a period of a few months to two years, depending on the species. Some frogs can live as long as 20 years.

Frogs also help to keep the balance of nature. They eat many of the insects that can destroy farm crops and ruin our gardens.

## Questions to Ask Before Viewing

- What do you know about frogs? (Accept all responses without correction. Write them on the board.)
- In what way are frogs different from other animals? (Accept all responses without correction. Note responses on the board.)

## Questions to Ask After Viewing

1. What is the word for animals that live both on land and in the water? (Amphibians. Write this word on the board.) What is the origin of the word "amphibian"? (It's a Greek word meaning "to lead a double life.") What are some amphibians relatives of the frog? (Toads, salamanders, and newts.)
2. Frogs are the smallest class of what major type of animals? (Vertebrates. Write the word on the board.) What does it mean that an animal is a vertebrate? (It has a backbone.)
3. How are the legs of frogs and toads different, and how does this lead to

different behavior in the two animals? (The frog's long back legs allow it to make long jumps. The toad's shorter back legs permit only quick, short hops.) How does the skin of frogs and toads differ? (The frog's skin is smooth and moist; the toad's skin is dry and bumpy.)

4. Frogs are ectothermic, or "cold-blooded." (Write these words on the board.) What does cold-blooded mean? (The animal's body temperature matches the temperature of the air or water around it.) Mammals, including humans, are "warm-blooded." What does that mean? (Their body temperature stays about the same, no matter what the temperature of the air or water around them. A human's normal body temperature stays about 98.6 degrees F.)
5. Why do frogs hide in dark, damp places and sleep all winter? (Being cold-blooded, they need to protect themselves from the cold.) What is this sleep called? (Hibernation. Add the word to the board.) Why don't hibernating frogs need to eat? (Their heart beats very slowly during their sleep, so they use up little energy and can survive on the fat stored in their bodies. Hibernating frogs get oxygen through their skin.)
6. Some frogs that live in hot, dry climates don't hibernate during the winter, but instead sleep through the summer to protect themselves from the heat. What is this summer "hibernation" called?

("Estivation." Write the word on the board.)

7. Why must frogs live in a pond "ecosystem," or near other water? (If their skin dries out they will die. Add "ecosystem" to the board.) Frogs don't drink water with their mouths. How do they get moisture into their bodies? (Through their thin, loose skin.)
8. How does the frog's skin help protect it from danger? (Its skin helps to camouflage the frog so it can blend in with its surroundings. Some frogs can even change color. Add "camouflage" to the board.)
9. Which animals are the natural enemies of frogs? (Large fish, turtles, birds, snakes.)
10. How do a frog's back legs help protect it from its enemies? (On land, its legs enable a frog to jump away quickly, up to many times its own length. In water, its webbed back feet help the frog swim fast. Add "webbed feet" to the board.) How does the frog use its short front feet, which are not webbed? (For support when sitting, for holding onto slippery rocks, and for putting food into its mouth.)
11. Describe the frog's tongue. (It is long, sticky, attached to the front of the mouth, and is rolled up.) How does the frog's tongue help it to catch food? (The frog unrolls its tongue and catches insects with the sticky surface.)
12. Frogs don't chew their food, but swallow it whole. Why does the frog pull its eyes into its head when eating? (This "blinking" helps push the food down the frog's throat.)
13. How are a frog's eyes special? (They're on top of its head, bulging out so it can see in all directions, even behind. It has a clear third eyelid that allows it to see underwater while protecting its eyes. The frog closes its eyes by pulling them inside its head.)

14. Since frogs don't have ears, how do they hear? (They have an eardrum located behind each eye.)
15. Why does a male frog make a "croaking" sound? (To attract females for mating.)
16. The female frog lays thousands of eggs called spawn. (Add "spawn" to the board.) Why do they lay so many eggs? (Most will dry out or be eaten by other animals.)
17. What is the natural process called in which only the strongest members of a species survive? (Natural selection. Add the term to the list.)
18. What is the newborn frog called and what does it eat? (It's called a tadpole or polliwog. It eats the yolk of its own egg.) How does the tadpole breathe? (Through gills.) What does the tadpole eat after it gets bigger? (Tiny water plants, called algae. Add "gills" and "algae" to the list.)
19. The process by which a tadpole changes into a frog is called "metamorphosis." Describe the tadpole's metamorphosis to an adult frog. (Its back legs begin to grow, then the front legs. It grows lungs and loses its gills. Finally its tail grows shorter and finally disappears. Write "metamorphosis" on the board.)
20. How many species of frogs and toads are there? (Over 2,500.)
21. How do frogs benefit humans? (They eat large numbers of insects that can destroy farm crops.)

### Additional Activities

- Review the responses to the questions asked before the program. Go over the words added during the course of your discussion. Ask students what they found most surprising about frogs.

- From the frog princes of fairy tales, to The Wind in the Willows, to Kermit the Frog, frogs have had an honored position in our literature and popular culture. There have also been many superstitions about frogs. Ask students why they think frogs have such a central place in our imaginations.
- Discuss with students the recent disappearance of frogs from many regions of the country. Point out how frogs are particularly vulnerable to water pollution and acid rain. Discuss the possibility that frogs are giving us an early warning sign we should heed.
- Collect a tadpole from a pond and put it in a fish tank in the classroom. As the tadpole changes into a frog, have students draw pictures of it during the various phases of its metamorphosis.

### Other Titles in the AIMS "Animals and How They Live" Series

- 9985 Snakes and How They Live
- 8222 Ants and How They Live
- 8223 Worms and How They Live
- 8224 Spiders and How They Live
- 8270 Newts and How They Live

### Length

- 14 minutes

### Subject Area

- Life Science

### Audience Levels

- Intermediate-Junior High

### Catalog Number

- 9984

### Annotation

This film looks at the life cycle and behaviors of the frog. It shows the unusual ways frogs

see, hear, taste, and smell, and explains how frogs protect themselves by hibernating in the winter or estivating in the summer. The complete metamorphosis of a frog from a tadpole is depicted.

### Discussion Guide

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## Frogs and How They Live

### Objectives

- To explore the life cycle of a frog.
- To shows physical characteristics and behaviors of a frog.
- To illustrate the concepts of metamorphosis, hibernation, estivation, and natural selection.
- To show an example of animal adaptation.
- To stimulate respect for nature and the environment.

