

- Replicate the investigation from the show, observing the growth stages of an amphibian in a classroom tank. Have your students describe, draw and record all of the stages. Refer to the "EEK!: Raising Frogs in the Classroom" Web page (<http://www.dnr.state.wi.us/org/caer/ce/eeek/teacher/frogact.htm>) for guidelines on how to conduct such an investigation.
- Collect and share examples of folklore, mythology, literature, music, games, dance or art that deal with frogs and other amphibians. Make a chart listing negative characteristics of the creatures on one side and positive characteristics on the other.
- Have students design and create a bulletin board display that shows the many different kinds of amphibians. Illustrate the characteristics of this group of animals.

### Internet Resources

- [www.seagrant.wisc.edu/madisonjason10/frogs.html](http://www.seagrant.wisc.edu/madisonjason10/frogs.html)  
This great site explains how and why scientists study amphibians, and includes an interactive investigation about the mysterious disappearance of many amphibians, as well as a listing of many worthwhile activities.
- [www.frogsonice.com/froggy/](http://www.frogsonice.com/froggy/)  
This "Froggy Page" contains extensive links to frog images, sounds, stories and science.
- [www.pca.state.mn.us/kids/frogsforkids.html](http://www.pca.state.mn.us/kids/frogsforkids.html)  
The Minnesota Pollution Control Agency "Frogs for Kids" Web site has strange frog facts, coloring pages, frog jokes and links for learning about frogs.
- [www.libsci.sc.edu/miller/Reptiles.htm](http://www.libsci.sc.edu/miller/Reptiles.htm)  
This is a thematic unit for 2nd and 3rd graders designed to help students learn more about the distinct characteristics of reptiles and amphibians, including an emphasis on the metamorphosis and development of amphibians. It lists resources available for the study of amphibians.

### Suggested Print Resources

- Clarke, Barry. *Amphibian (Eyewitness Books)*. Knopf, New York, NY; 1993.
- Cowley, Joy. *Red-Eyed Tree Frog*. Scholastic, New York, NY; 1999.
- Hickman, Pamela. *A New Frog: My First Look at the Life Cycle of an Amphibian*. Kids Can Press, New York, NY; 1999.
- Himmelman, John. *A Salamander's Life (Nature Upclose)*. Children's Press, New York, NY; 1998.

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- Owings, Jennifer. *Poison Dart Frogs*. Boyds Mills Press, Honesdale, PA; 1998.
- Pfeffer, Wendy. *From Tadpole to Frog*. Harper Trophy, New York, NY; 1994.

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### TITLES

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| • ALL ABOUT AMPHIBIANS                      | • ALL ABOUT DINOSAURS                    |
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2/02



## All About Amphibians

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

**Before Viewing:** Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create a "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

**After Viewing:** After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



## Program Summary

Over many millions of years, amphibians developed from fish. Today, there are more than 3,000 types of amphibians, separated into three groups based on their body shapes as adults: amphibians that can jump (frogs and toads), amphibians that have tails (newts and salamanders), and a less common amphibian that is blind and legless.

Most amphibians spend part of their lives in water and part on land. This interesting “double life” means that most start life with gills, then develop lungs to breathe when they go through the process called metamorphosis. The life cycle of frogs provides a good example of metamorphosis. First, frogs hatch from eggs to become tadpoles with gills and tails, which they use to swim through water like fish. Before leaving the water, frogs lose their tails, grow limbs and develop lungs to breathe in air — everything needed to survive on land. In a sense, amphibians are the middle link between fish in the water and reptiles on land; early in life, frogs resemble the fish from which they developed, while later in life, they more closely resemble their reptile descendants.

Amphibians have backbones and are cold-blooded. Because they can’t warm themselves, many amphibians need to hibernate in cold weather. Young amphibians use their gills to take oxygen from the water, while adults have lungs to do the same from the air. Yet all amphibians have moist skin that is also used to take oxygen from the air. In fact, some amphibians actually get more oxygen through their skin than through their lungs!

The program also reviews how frogs use their senses and how some amphibians use their colors to blend in with their surroundings. In addition, Dr. Ken Nagy, a biology professor at UCLA, explains the eating habits of some amphibians, while students participate in a hands-on investigation that shows the growth stages of a frog over a sixteen-week period.

## Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

**amphibians** — Cold-blooded animals with backbones and smooth, moist skin that spend part of their lives in water and part of their lives on land. Frogs, salamanders, toads and newts are all amphibians.

**amphibious** — A word that describes something that is adapted for both land and water.

**fish** — Cold-blooded animals with backbones and scales that live in the water, move with fins and breathe with gills.

**reptiles** — Cold-blooded land animals with backbones and scales that breathe with lungs.

**gills** — The organs that fish and amphibians use to take in oxygen from the water.

**lungs** — The organs that land animals use to breathe in air and exhale.

**vertebrates** — Animals that have backbones.

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**cold-blooded** — A term that describes animals that cannot control their own body temperature, so they assume the temperature of their environment (like fish, reptiles and amphibians).

**metamorphosis** — The process of changing form during the life cycle of an animal.

**tadpoles** — Swimming amphibians with gills that have hatched from their eggs and will develop into adults with lungs.

**limbs** — The arms or legs of an animal’s body. Most amphibians have four limbs, but there is a group of blind amphibians that are limbless.

**eardrums** — A thin ear covering that vibrates and helps animals hear sounds. Frogs have round flat patches on both sides of their head, which serve as hearing organs. Humans have eardrums inside their ears.

**vocal sacs** — A pouch in a frog’s mouth that can fill up with air and increase the loudness of the frog’s croaking.

**mucus** — A slimy coating that protects the skin of amphibians by keeping their bodies moist. Some amphibians have mucus that is poisonous.

**hibernate** — To pass a cold winter or dry season in a resting state until the weather becomes favorable for survival.

**biologist** — A scientist who studies living things (plants and animals).

## Pre-viewing Discussion

Before students generate their list of “Everything We Know About...” this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. Name some animals that are amphibians.
2. How are amphibians different from other animals?
3. Where do amphibians live?
4. How are fish, reptiles and amphibians alike?

After the class has completed their “Everything We Know About...” list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

## Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. What are some characteristics of amphibians?
2. How do scientists think amphibians developed over millions of years?
3. Which animals developed first: fish, amphibians or reptiles?
4. What does the word “amphibious” mean?
5. What are gills? At what stage in their life do amphibians have gills?
6. What are lungs? Why do amphibians develop lungs?

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7. What does being cold-blooded mean?
8. What are two things that are special about an amphibian’s skin?
9. Why do amphibians have to live near water or in moist environments?
10. How are amphibians like fish? How are amphibians like reptiles?
11. What are the three different groups of amphibians?
12. What do amphibians eat? How do they eat?
13. What is metamorphosis? What are the stages of a frog’s metamorphosis?
14. About how long does it take for a frog to change from an egg into a frog?
15. Why does a frog’s croaking sound so loud?
16. When would an amphibian have to hibernate? Why?

## Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their “Everything We Know About...” list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

1. Discuss the many ways in which amphibians protect themselves from predators and their environment.
2. Metamorphosis plays a large role in the life cycle of amphibians. After reviewing the process, have students name some other animals that go through a metamorphosis during their lives. In addition, have students discuss the importance of habitat in this process.
3. Discuss why many amphibians hide during the day and become active at night.

## Follow-up Activities

- Tell your students to imagine that they will magically turn into amphibians for one day. Have them choose an amphibian and create an illustrated story describing themselves as the frog, toad, salamander or newt of their choice. Make sure they describe their appearance, their habitat and their behavior.

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