Frogs, Frogs, Frogs!

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Name _____

Frogs. We see them as we walk around ponds and hear their ribbeting chorus. We marvel at their leaping abilities and their wide range of spectacular colors. Here are some fascinating frog facts: Both frogs and toads can be found all over the world except for Antarctica and the earliest known frog appeared about 190 million years ago.

Take a moment to think about frogs. How do they differ from toads and in what ways have these amphibians adapted to their environments? Why is their population declining and what can be done about it?

In this month's Internet Challenge™, we will uncover the answers to those questions. In addition, we will research some of the many varieties of frogs throughout the world.

Our first Web site, at the American Museum of Natural History, is called Frogs: A Chorus of Colors. Go to http://www.amnh.org/exhibitions/frogs/

Click "A Frog's Life" and read the text in each of the seven chapters (click "next."). Then you will be ready to answer the first set of questions.

1. The word "amphibian" means "dual life" – living part on land and part in water. Why do you think that frogs need to stay connected to water?

2. Explain the role of the frog's eyes when it swallows food.

3. Identify the different types of specialized glands of a frog.

4. Why do frogs produce sticky mucus on their skin?

Good answers!

Now, click "Featured Frog Species." Read each of the thirteen articles about a different type of frog, its size, habitat, food, and its life cycle.

5. Compare and contrast the three different types of amphibians: frogs, caecilians, and salamanders.

Now, click "Featured Frog Species." Read each of the thirteen articles about a different type of frog, its size, habitat, food, and its life cycle.

6. How has the African bullfrog adapted to its environment?

7. Explain the smooth-sided toad's method of eating its prey

8. Give an explanation telling how the Chinese gliding frog and the Mexican dumpy frog have adapted their unique feet to their forest habitats.

Very good!

Our next site is PBS-Nature Critters: Frogs and Toads located at http://www.pbs.org/wnet/nature/critters/frogandtoad.html

Read the information and choose the correct answer for the statement below.

9. Frogs and toads are warm-blooded.

   a. True

   b. False

Zoom over to Animal Bytes at the San Diego Zoo to learn more about frogs and toads. Point your browser to http://www.sandiegozoo.org/animalbytes/t-frog_toad.html

10. Give details about a type of toad that was introduced into Australia in 1935 to eradicate a particular pest, but the plan backfired. Ultimately, the toad was more of a problem and became a pest.

    a. How did this happen?

    b. What conclusions can you draw from this situation?

Terrific answers!

Go to Exploratorium – Frogs, the Amazing and Adaptable Frog at www.exploratorium.edu/frogs/

Click "The Amazing, Adaptable Frog" and read the six-page story by Pearl Tesler. Then, answer the next set of questions.

11. Explain the similarities and differences between a frog and a toad.

12. How does a frog with "flash colors" act when it is threatened?

13. List some possible reasons for the disappearance of frogs and for the emergence of deformed frogs.

14. Choose a synonym for "bonanza" in the following sentence: *Frogs' skin is a pharmacological bonanza, containing all manner of interesting compounds.*

    a. jackpot

    b. disaster

Go to Center for Global Environmental Education – A Thousand Friends of Frogs. You can find this site at http://cgee.hamline.edu/frogs/

Click "Students" and then "Science." Finally, click "Amphibian Facts." Read the information on this page and then answer these questions.

15. What does a bio-indicator tell us about our environment? How are frogs a bio-indicator for us?

Excellent!

Extension Activities – Choose one or all of them!

- Go to "Ology – The Legend of the Flying Frogs," located at http://www.amnh.org/ology/biodiversity/stufftodo/flyingfrog.html. Follow the directions on the page. Create your own fun story and share it with your teacher and classmates. Talk about it!

- Read an award-winning essay written in 2002 by a seventh grade student. Go to Young Naturalist Award – Deformed Frogs: the Big Mystery at http://www.amnh.org/nationalcenter/youngnaturalistawards/2002/john.html. If you could interview this student today, what three questions would you ask him? As the author states, "Frogs are considered a 'canary in the coal mine' for potential human health problems because they are so sensitive to changes in the environment. Do you agree or disagree with his statement? With your classmates, conduct a roundtable discussion about this and give your opinion. Talk about it!

- Take a quiz at Frogs.org - Amphibian Conservation Alliance (browse to http://www.frogs.org/library/item.asp?InfoResourceID=65). Talk about your answers with your classmates and teacher and see if you are an expert about amphibians.

- Create a timeline that illustrates the life cycle of a frog, from egg to adult. Include text and images in your timeline. After you are done, show it to your teacher and classmates. Talk about it!

Additional Web sites to explore:

- http://www.kiddyhouse.com/Themes/frogs/
- http://www.naturehaven.com/Frog/toad.html
- http://www.naturehaven.com/Frog/frog.html
- http://42explore.com/frogs.htm

Congratulations! You have done a fantastic job completing this Internet Challenge™.

Answers to April's Internet Challenge™

1. Frogs and other amphibians live in all but the harshest land environments, but many remain tied to water for development of their eggs and tadpoles.

2. When a frog swallows food, it pulls its eyes down into the roof of its mouth. The eyes help push the food down its throat.

3. Some of the bumps and warts that give frog skin its texture are clusters of specialized glands. Mucous glands lubricate the skin. Granular glands produce poisons and other protective chemicals.

4. Many frogs have a special drink patch on the underside of the body. Like a giant lung, the thin, moist skin allows gases to pass through, helping the frog to breathe. To keep the skin working well, frogs must stay clean and moist. They produce sticky mucus to prevent drying. Most frogs shed the outer layer of skin by twisting and stretching—they often eat the dead skin as it comes off.

5. Frogs are the only amphibians without tails—they also lack necks. Most have short bodies, bulging eyes, and powerful legs. Frogs are the most successful amphibians by far. There are over 4,000 species of frogs living on every continent except Antarctica. Caecilians are legless amphibians that live underground or in water. With just over 160 species known, this is the smallest group of amphibians; little is known about their secretive lives. Salamanders have short legs, lanky bodies, and long tails. Over 400 species live mostly in the temperate zone. Many salamanders are small, but the group includes the largest of all amphibians: the five-foot Chinese giant salamander.

6. African bullfrogs live in the sub-Saharan desert in Africa and grow up to eight inches in diameter. They are able to live without food or water for months by digging underground. When the rains arrive, they emerge to eat and mate. They eat almost anything that moves, such as insects, reptiles, small mammals, and even other frogs.

7. Most frogs have short, pointed teeth for gripping its prey. However "true toads" in the Bufonidae family have no teeth at all. These bold predators catch prey with their sticky tongues and swallow it alive.

8. Chinese gliding frogs have enhanced webbing between their toes. As they leap, their toes spread, and the webbing stretches like the wing of a hang glider. Gliding frogs can soar and land gracefully from daunting heights. Their winged feet allow them to bank and steer through the air, and adhesive toe pads help them stick where they land. The toe pads of most tree frogs, including the Mexican dumpy frog, are covered with tubular cells standing on end. These tiny bristles compress and bend under pressure, allowing the toe pad to form-fit over irregular surfaces. Mucus on the tips of the bristles allows them to stick to almost anything. Most tree frogs can climb straight up trees, cling to the undersides of leaves, or hang from a branch by one toe.

9. (b)

10. (a) The Latin American cane toads, Bufo marinus, were introduced to Australia in 1935 to kill sugarcane beetles. Instead of getting rid of the beetles, the toads preferred to eat native frogs, small marsupials, and snakes. Not only that, but the Latin American cane toads poisoned everything that tried to eat them, including rare animals like Tasmanian devils and pet dogs! Since they lay more than 50,000 eggs at a time, they turned into bigger pests than the beetles they were supposed to get rid of. (b) Students own comments.

11. Both toads and frogs are members of the order Anura, a group that experts usually refer to simply as frogs. Within this large group, the name "toad" is given to those with dry, warty skin and short hind legs for walking instead jumping. Meanwhile, those with smooth, moist skin and long, strong,

webbed hind legs for swimming and jumping are frogs. In general, frogs live in moist climates and lay their eggs in clusters, while toads live in drier climates and lay their eggs in long chains. However, there are frogs with warty skin, and toads with slimy skin! Many species fit equally well into both categories. Technically speaking, toads are frogs.

12. Frogs that look dull and unassuming at first have "flash colors" – hidden patches of bright color or patterns on their bellies, groins, or the backs of their thighs. The plain brown back of the fire-bellied toad matches the ground on which it spends most of its time. When threatened, the toad exposes its bright red underside. This can startle or confuse predators into fleeing, or at least buy the frog some time in which to make an escape.

13. Some possible factors could be (a) climate changes, including global warming and thinning of the ozone layer; (b) destruction of habitat; (c) pollution (water pollutants like pesticides and acid rain); and (d) a recently-discovered skin fungus that slowly suffocates frogs by attacking the skin through which they breathe. However, this type of fungus does not usually attack frogs, a fact which leads some scientists to think that frogs' vitality is weakening from other environmental stresses.

14. (a)

15. A bio-indicator is a living (bio means life) creature that indicates something about the area that it lives in. It can be something positive or negative. Sometimes bio-indicators can be used to show us that the quality of the air we breathe or water we drink may not be of a high quality. Another example is the presence of large numbers of frogs in an area tells you and scientists that the environment is healthy and complete for the frogs. If for some reason, frogs are suddenly missing from an area or their population is declining, then this is a sign that their environment is changing, which would be a red flag

Extension Activities – students own answers.