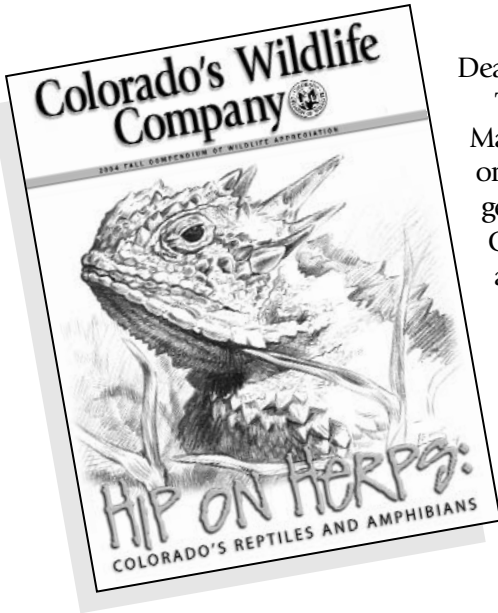


Educator's Guide



Dear Educator:

There's something irresistible about frogs, turtles, lizards, and snakes to most children. Many youngsters are so intrigued by these creatures that they spend hours trying to catch or watch them. Imagine your students' delight when they discover that some people get paid to do just that! In this edition of the Educator's Guide to Colorado's Wildlife Company, students will first learn a few tricks to identify different frogs and toads in a safe and ethical way, and will then "play" with words as they explore interesting wildlife-related occupations.

Colorado's Wildlife Company and this publication are both available at our Web site: www.wildlife.state.co.us/colo_wild_co/homepg/cwcindex.htm. Comments or suggestions for this publication can be sent to wendy.hanophy@state.co.us.

Hoping this "ist" fun for all!
Wendy Hanophy



What's a Nice Herpetologist To Do?

CAREER EDUCATION, SCIENCE

Herpetologists try to observe and identify animals without interrupting their normal activities or harming them in any way. Usually, they recommend that people view reptiles and amphibians from an appropriate distance and, if possible, use a pair of binoculars or a spotting scope. Often, this allows a sufficient view of the creature to identify it. However, some species can only be identified by checking for small field marks or counting grooves or examining scales. On rare occasions, you may need to pick up the animal and examine it

more closely to be able to make out what species it is. Here's how to make it safe for both you and the animal:

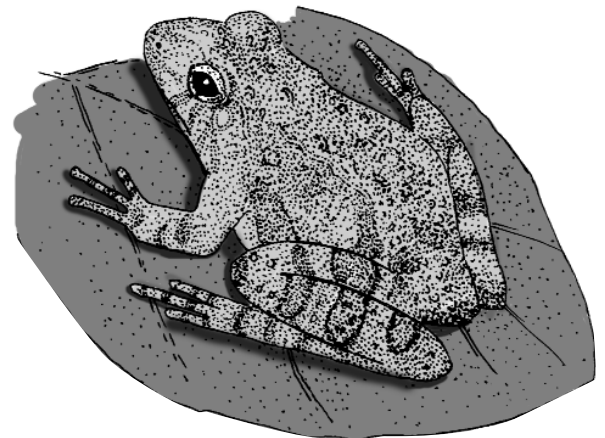
- Carry and use disposable latex gloves. Hand lotions and bacteria on your hands can harm most amphibians. Likewise, some frogs and toads have predator-deterrent poisons or foul-tasting substances on their skin that you may find unpleasant. Also, reptiles and amphibians can sometimes carry transmittable diseases.
- Have a large plastic sandwich bag with you. Some lizards' tails break

off easily. Place the lizard into the bag while you view it to reduce the chance of hurting it or breaking its tail.

- Do not grab the "business" end of any animal—most will bite. For your safety and the health of the animal, place your hand around the middle of the body between the front and hind legs.
- Before picking up any snake, be certain it is not venomous and be sure to support its spine in two places using both hands.

FERRETING OUT FROGS

While many herpetologists study all kinds of amphibians and reptiles, some concentrate all their effort on **anurans**, which you know as frogs or toads. You can find and identify anurans with the same wildlife watching skills you use for other animals. You need to look in the right places at the right times. Most frogs and toads are found in moist or wet habitats. They are cold-blooded and their body temperature varies with the temperature of their surroundings. When it is too hot or too cold, frogs and toads stop moving and are much harder to find.



Name That Toad or Frog or Toad or . . .

SCIENCE

So, what is this thing that you found? The words frog and toad are not really scientific terms. Generally, frogs live in or near water and have smooth, soft skin. Toads, on the other hand, are often found on land and have thick, warty skin. To really be sure, you need to look for some distinguishing and unusual field marks. Some of these features have some strange names, and this composite anuran has all of them!

DORSAL (BACK) SIDE

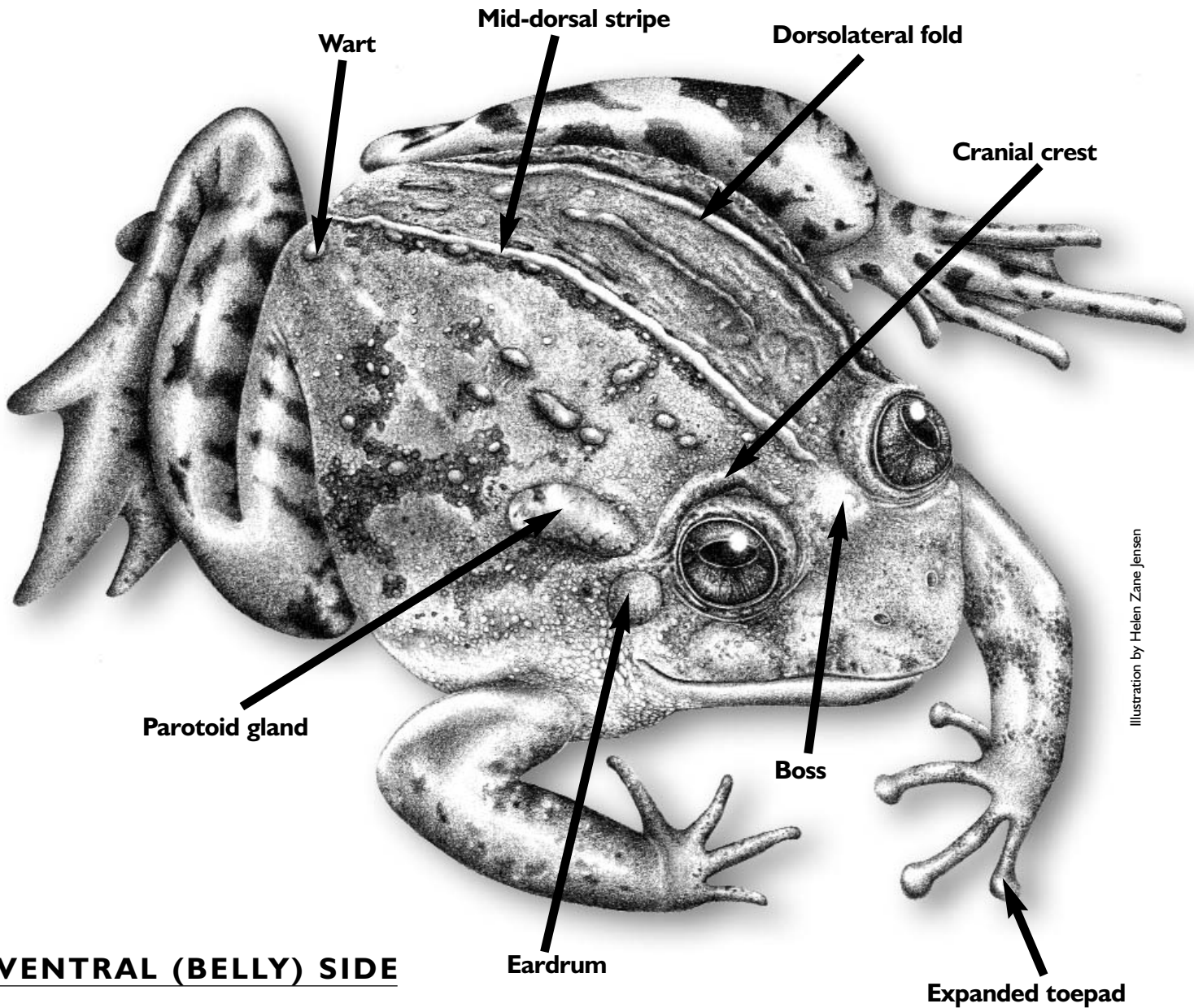


Illustration by Helen Zane Jensen

VENTRAL (BELLY) SIDE

A **boss** is a lump between the eyes.

A **cranial crest** is a ridge that borders the middle and top side of the eye.

Dorsolateral folds are folds of skin on the sides of the back.

A **mid-dorsal stripe** is a stripe down the middle of the back.

Parotoid glands Parotoid glands are found behind the eyes of toads and give off a toxic substance.

Warts are bumps on the skin.

FEATURING FROG FEET

When life gets tough for the average anuran, it digs itself a deep hole and backs in! Many frogs and toads have feet especially adapted for this purpose. Some have hardened wart-like bumps called **tubercles** that are good for pushing dirt, and others have **spades**—horny projections that act like little shovels.

Either way, when the resourceful little anuran needs an underground retreat, it burrows. It backs into the ground by pushing with its tubercles or spades and rotating its body. It looks like it's trying to squish ants while doing the "Twist" as it steadily digs a shelter as deep as three feet below ground!

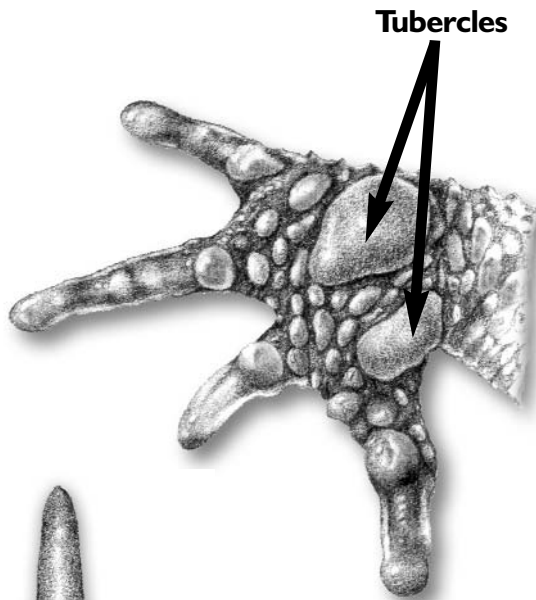


Illustration by Helen Zane Jensen

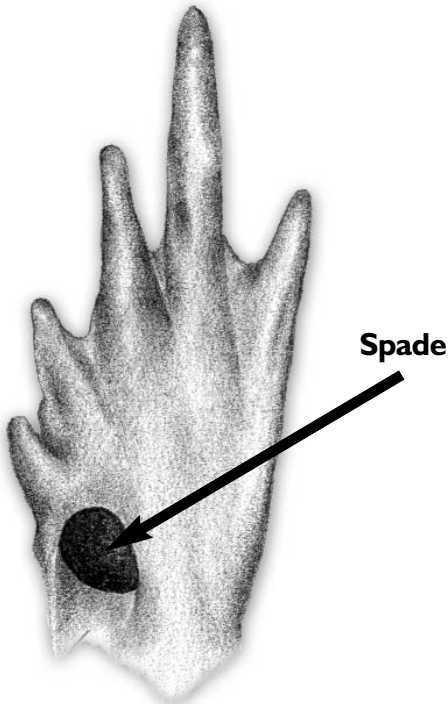
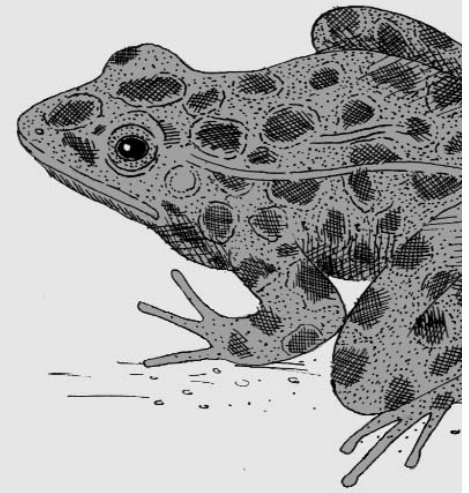


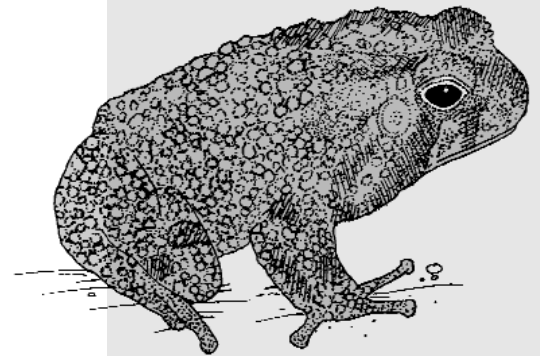
Illustration by Helen Zane Jensen



Once you have noted your animal's appearance, you can use keys found in field guides and the Colorado Herpetofaunal Atlas Web site:

http://wildlife.state.co.us/species_cons/HerpetofaunalAtlas.asp to name your species.

The Web site has pictures, sounds, and information about the habitat and life history of your toad or frog!



TOAD TRACKING TUNES!

Just like birds, nearly all male frogs and toads have distinctive calls that are very useful in identification. One way to try to locate frogs and toads is by using a process called triangulation. You and a buddy stand in different places and walk toward the sound of the frog call. When you both meet, the frog should be at your feet!

“-Ist” Science in Your Future?

CAREER EDUCATION, LANGUAGE ARTS, SCIENCE

After reading this issue of Colorado’s Wildlife Company, you learned that a herpetologist is a person who studies reptiles and amphibians. The suffix -ist is attached to the end of a word to describe a person in one of four ways. The resulting word can describe a specialist in a given profession, such as the herpetologist. An -ist word can also

describe someone who performs a certain task or produces, operates, makes or plays something. Examples are flutists—people who play flutes, or novelists—people who write novels. Sometimes -ist is connected to a word to describe a personality trait or quality. An optimist is someone who always expects the most favorable, that is, the most optimal,

result in any situation. Pessimists, on the other hand, always expect the worst! Lastly, the suffix is sometimes used to describe a person who advocates certain beliefs, doctrines or theories. For instance, people who wanted to abolish slavery before the Civil War were called abolitionists.

The dictionary is filled with words that end in the suffix -ist. Here is just a sampling of a list of specialists in science professions. What does each specialist study?

- | | | | | |
|------------------|--------------------|--------------------|--------------------|--------------------|
| 1. Agronomist | 8. Cytogeneticist | 15. Geneticist | 22. Meteorologist | 29. Pharmacologist |
| 2. Archaeologist | 9. Cytologist | 16. Geologist | 23. Microbiologist | 30. Physiologist |
| 3. Biochemist | 10. Dendrologist | 17. Histologist | 24. Mycologist | 31. Taxonomist |
| 4. Biologist | 11. Ecologist | 18. Horticulturist | 25. Nutritionist | 32. Zoologist |
| 5. Botanist | 12. Embryologist | 19. Ichthyologist | 26. Oologist | |
| 6. Chemist | 13. Epidemiologist | 20. Lepidopterist | 27. Ornithologist | |
| 7. Climatologist | 14. Etiologist | 21. Mammologist | 28. Pathologist | |

TRICK QUESTION: How many of the specialists listed above might be involved with a wildlife management issue? _____

Can you find three more examples of “-ist” words that can:

- describe a specialist in a given profession

- describe someone who performs a certain task or produces, operates, makes or plays something

- describe a personality trait or quality

- describe a person who advocates certain beliefs, doctrines or theories

ANSWER KEY

1. Soil management and crop production	8. Cell genetics	14. Causes of disease	22. Weather
2. Past life and culture	9. Cells	15. Genetics	23. Microorganisms and their effects on other forms of life
3. Chemistry of living organisms	10. Trees	16. Origin, history, and structure of the Earth	24. Fungi
4. Living organisms	11. Relationships between organisms and the environment	17. Plant and animal tissues	25. Nutrition
5. Plants	12. Growth and development of organisms	18. Cultivation of fruits, vegetables, and other plants	26. Bird eggs
6. Chemistry	13. Epidemics and endemic diseases	19. Fish	27. Birds
7. Climate		20. Moths and butterflies	28. Disease
		21. Mammals	

TRICK QUESTION: All of them!