

Call of the Wild



Goals:

To understand the nature of frog calls and explain how they call.

Objectives:

- Students will describe the purpose of various frog calls
- Students will learn the anatomy of the frog responsible for frog calls.

Grade Level: 5-8

Subject Areas:

science

Materials Needed:

- science notebook
- recordings of frog calls — *Sounds of North American Frogs* at <http://www.folkways.si.edu/albumdetails.aspx?itemid=2421>
- slips of paper
- device for recording students' versions of frog calls
- pictures of frogs with inflated vocal sacs (use Google images—insert the species and the words "vocal sacs")
- pictures of frogs (see activity for specific species)
- flashlights
- first-aid kit
- insect repellent (optional)

Time to Complete:

40 minutes, with 30-45 minutes for night observation

Background

If someone asked you to imitate the sound of a frog, you probably wouldn't grunt like a pig or whistle. But some frogs make sounds just like these! And others "snore," "trill," or even "bark."

Here's a way for your kids to become familiar with the sounds some amphibians make and learn why they make them. They'll also get a chance to hear (and maybe even see) some singing frogs in action. Note: Most scientists use the term "frog" to refer to both frogs and toads. In this activity we're using "frog" the same way.

Making Sense of Sounds

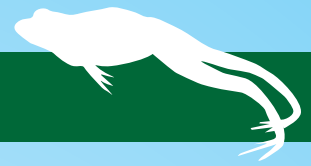
Frogs can make all kinds of sounds including clicks, whistles, grunts, and trills. Here's a run-down of the types of calls they make and why and how they make them.

Why They Call

Mating Calls: The number-one reason frogs call is to attract a mate. And almost all male frogs make mating, or advertisement, calls. (Female frogs don't make mating calls.) Each species has its own particular call and characteristic place (or places) to call from. For example, some frogs call from the water, some call from shore, others call from shrubs or other vegetation, and so on. Only receptive females—those that are ready to lay their eggs—respond to the mating calls of the males. (In some species the sound of the mating call is believed to make the females ready to breed.)

Many male frogs don't "sing" alone. Instead small numbers of them gather, often within a relatively small area, and call in a group, creating a mating chorus. Frog choruses are often loud and are believed to help attract females to suitable mating areas. When several different species chorus in the same general area at the same time, they create a mixed chorus. In many parts of the country different species mate at different times of the year, and mixed choruses may not be made up of more than just a few species. But in Florida and some other areas in the South, there may be as many as 14 species contributing to a mixed chorus.

Territorial Calls: During the breeding season, some male frogs warn other males to stay away by giving a territorial call. In some species, the mating call also serves as a territorial call. In some other species, territorial calls are part of the mating call. For example, in Puerto Rico, Coqui frogs have a two-note call, "co-qui." The "co" tells other male frogs to stay away, and the "qui" invites females to come closer. And some frogs have territorial calls that are completely distinct from their mating calls.



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Release Calls: During the frenzy of the breeding season, adult male frogs may grab at almost anything that moves. But sometimes they grab another male or an unreceptive female. By giving a release call, the frogs that have been grabbed let the male know that he's wasting his time and should let go. (When frogs give release calls they also vibrate their bodies. These body vibrations may be even more important than the call in letting the male frog know he's making a mistake.)

Distress Calls: Sometimes referred to as "screams," distress calls are given by some frogs when they are grabbed by predators. These calls are very loud and may startle the predator into dropping the frog, allowing it to escape. They may also warn other frogs to watch out for danger. In some species both the males and females make distress calls.

How They Do It

Frogs make almost all of their calls with their mouth closed. (Most frogs make distress calls with their mouth open.) And most frogs make their calls using vocal cords. First they take air into their lungs and then they close their mouth and nostrils. Next they push the air back and forth between their lungs and mouth. As the air travels back and forth, it passes over the vocal cords and makes them vibrate, producing sound.

The speed at which air passes over a frog's vocal cords affects the type of sound the frog makes. For example, some species trill by pushing air back and forth more than 60 times per second! The size of a frog and the way its vocal cords vibrate also affect the type of sound it makes.

Many male frogs also have vocal sacs that resonate their calls. These sacs are stretchy pouches of skin located near the frog's mouth or neck. The male inflates his vocal sacs by pushing air through slits in the floor of his mouth. As he calls, his inflated sacs resonate the sound.

Depending on the species, a male frog may have one or two vocal sacs. When they're inflated, some vocal sacs look like balloons.

Preparation

Frogs and Their Calls

1. Listen to and try the calls yourself, and bookmark these pages to share with your students.

- Gray Tree Frog - flutelike trill (put tongue on roof of mouth and trill) [recording: <http://www.enature.com/fieldguides/detail.asp?recnum=AR0020>]
- Spotted Chorus Frog - rasping trill (say "wrrrank, wrrrank, wrrrank, " trilling the Rs) [recording: <http://www.enature.com/fieldguides/detail.asp?recnum=AR0562>]
- Strecker's Chorus Frog - clear, sharp whistles (give high-pitched whistle, two whistles per second) [recording: <http://www.californiaherps.com/noncal/misc/miscfrogs/pages/p.streckeri.sounds.html>]
- Northern Cricket Frog - metallic, measured clicking (say "gick, gick, gick," one "gick" per second) [recording: <http://www.enature.com/fieldguides/detail.asp?recnum=AR0554>]
- Great Plains Narrow-mouthed Toad - high-pitched nasal sound (say "NEEEEEEE") [recording: <http://www.enature.com/fieldguides/detail.asp?recNum=AR0545>]

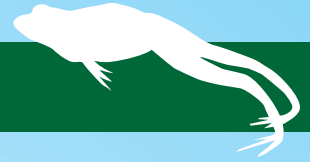
2. Send home note for a "Frog Watch and Call" party.

Procedure

Part 1: Frog Songs

1. Begin by having the kids imitate any frog calls they know. Then, using the information under "Making Sense of Sounds", discuss why and how frogs call. Point out the variety of sounds these animals make—from flutelike trills to pig-like grunts. Play recordings of real frogs making each of the different types of calls. And show the kids pictures of frogs with inflated vocal sacs as you explain how these sacs work. (You might also want to explain to the kids that not all frogs make sounds. For example, in many species only the males call and in others both the males and females are voiceless.)
2. After your discussion tell the kids that they're going to get a chance to imitate the calls of some different frogs. First copy each of the frog names listed above under "Frogs and Their Calls" onto separate slips of paper and put them in a sack. Then divide the kids into five groups and have each group pick a species to imitate by drawing one of the slips of paper from the sack. Explain that all of the frogs whose names they drew are real and that they can be heard chorusing in some areas of the country.

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3. Now show each group a picture of their frog and explain its call to them. (The calls are listed above under "Frogs and Their Calls". We've also included suggestions for how to imitate the calls. These are given in parentheses after each call.) Then have the groups practice making their calls. Encourage them to give their calls clearly and not to shout them out.
4. Once the kids have practiced their calls, use a recording device to record each group one by one. Then try creating a mixed chorus by having all the groups call at once. Once again, use the tape recorder to record the kids. Afterward let the kids listen to the individual species' calls and then the mixed chorus. Can they pick their call out of the din? Can they pick out each of the other species' calls?
5. In their science notebooks have students sketch their frog along with applicable labels and descriptions as you see fit.
6. Make a Thinking Map®-Tree Map. (mating calls, territorial calls, distress calls, and release calls)
7. Frog Vocal Anatomy <http://animals.howstuffworks.com/amphibians/frog3.htm>. Have your students try to sketch what this looks like from the description only, then ask them to share amongst their peers.

Extension

Part 2: Out at Night!

Now that the kids are familiar with frogs and some frog calls, take them on a night hike to hear a "live" performance! Here are some suggestions to make your trip more enjoyable and as always be sure to have students write in their science notebooks:

- Ponds and wetlands are some of the best places to hear frogs calling. Be sure to visit the area during the daytime to familiarize yourself with it and to find safe spots where the kids can get close to the water's edge. Also be sure to go out the night before you take the kids to see if the frogs are calling. If there are no ponds or wetlands in your area, try a wooded area that has temporary pools in it.
- A damp, warm night in springtime or early summer is probably the best time to go out to hear frogs

calling. But, depending on where you live, you may be able to hear frogs "advertising" at other times of the year as well. Check with a local nature center, zoo, natural history museum, or university department of biology, zoology, or herpetology for tips on which species you can hear at different times of the year.

- If possible, play recordings of some of the species you are likely to hear before you go on your trip.
- Wear rubber boots or old sneakers for the hike. It's easy to get your feet wet while tromping around the edges of ponds and wetlands! And depending on the time of year, you may want to bring along some "bug juice" to ward off biting insects.
- Don't forget flashlights! Once you've gotten close to some calling frogs, you can use the flashlights to get a look at them.

Safety Note: Going out at night to hear frogs calling can be a lot of fun. But it also means taking extra precautions. Be sure to get permission before visiting an area, and bring plenty of adults along to help supervise. And carry a first-aid kit with you, just in case.

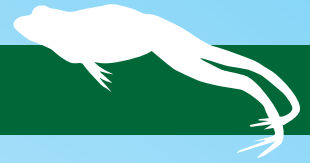
Assessment

1. Creative Writing: Have students use this prompt to write about "Last night you'll never guess what I heard!" Students will make a story using the frog species presented in this lesson along with information about the reasons for the sounds they heard. Be sure to have students use their keen sense of observation to describe the habitat they are in.
2. Participate in Wildlife Watch: <http://www.nwf.org/WildlifeWatch/>. After looking at the site this would be a great way to encourage your students to get outside and connect with nature.

Children's Literature

- *Face to Face with Frogs (Face to Face with Animals)*, by Mark W. Moffet
- *Frogs*, by Nic Bishop
- *The Frog Scientist (Scientists in the Field Series)*, by Pamela S. Turner

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- *Uncover A Frog (Uncover Books)*, by Aimee Bakken
- *Frog Heaven: Ecology of a Vernal Pool*, by Doug Wechsler
- **Frogs: A Chorus of Colors**
<http://www.amnh.org/exhibitions/frogs/>

Resources

- **Welcome to Frogland!**
<http://allaboutfrogs.org/>
- **University of Wisconsin:**
<http://seagrant.wisc.edu/frogs/>
- **Thinking Maps®:**
<http://www.thinkingmaps.com/products.php>