



# Frisch's Outreach: Talk It Up! (Gr.4-6) Extensions

**At a glance**  
**This program will allow students to understand how animals will communicate in a variety of ways.**

**Goal(s)**

This lesson will allow students to explore the many ways animals communicate.

3) Students will be able to name one example of audible animal communication.

4) Students will be able to name two examples of inaudible animal communication.

**Objective(s)**

1) Upon completion of this program students will be able to identify specific adaptations animals utilize in their communications.

2) Students will be able to name at least three ways animals use communication to survive.

**Theme**

Animals use communication to survive

**Sub-themes**

Animals have many diverse ways to communicate.

**Academic standards**

Ohio Science Academic Content Standards	<i>Grade 4 Life Science</i> Diversity & Interdependence of Life 5 Heredity 5 <i>Grade 5 Life Science</i> Diversity & Interdependence of Life 3,5 <i>Grade 6 Life Science</i> Diversity & Interdependence of Life 2
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Kentucky Core Content— Science	<p>Life Science:</p> <p>Grade Grades Primary through 4:  <i>The Characteristics of Organisms</i>: SC-E-3.1.2, SC-E-3.1.3  <i>Life Cycle of Organisms</i>: SC-E-3.2.2  <i>Organisms And Their Environment</i>: SC-E-3.3.1</p> <p>Grades 5-6  <i>Regulation &amp; Behavior</i> SCM-3.2.2,SC-M-3.2.3  <i>Diversity &amp; Adaptations of Organisms</i> SC-M-3.4.1 ,  SC-M-3.4.1,3.5.2</p>
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## Background

Within the community of animals survival is dependent on how well an animal can acquire and maintain food, water, shelter, and stay safe in their space. Each animal’s unique adaptations allow them to attempt to succeed in these tasks.

Animals can use communication to aid them in their challenge for survival. The types of animal communication are as diverse as animals themselves and we are just beginning to uncover some of the fascinating secrets held within their communications.

Communication by an animal is any behavior on one animal’s part that has an

effect on the current or future behavior of another animal. Communication can take many forms that we can observe and some mysterious forms that are not so readily understood by man.

Audible communication is perhaps the easiest for us to identify but our understanding of its intricacies is still very basic. Birds, monkeys, gibbons, frogs, etc. use vocalizations to mark territories, court mates, warn of danger, locate/ beg for food, stay in groups, and attempt to frighten predators, etc. over short spaces or long distances. Howler monkeys can be heard ten miles away which helps keep their groups together. Hyenas “laugh” to keep their



pack cohesive. Owls, during courtship, will call alternately to each other (“dueting”) and the calls’ pitch can identify the sex of each owl. The audible begging response among many baby birds will trigger a feeding response from the adult bird. Some research suggests that certain clucks made by chickens tell what kind of food is located for the flock. Some monkeys have separate, distinct alarm calls which will tell the group if the predator is on the ground or in the trees (leopard) or in the air (eagle). Recent research suggests that birds also have these identifying alarm calls. Animals that belong to social groups will alarm call so that individuals can run for cover, freeze, or gather as a

group. Dolphins and whales have distinct clicks and squeaks to communicate with each other under water over many miles. It has been discovered that Killer Whales may have accents or dialects for hunting that are individual pod specific. At times alarm calls are not vocally produced. Rabbits will pound their feet in warning.

There are communicating sounds made by animals that are sub-audible or infra-sonic. Elephants can hear low sounds undetected by humans. Their feet can detect low frequencies of sound not perceived by man. Echolocation, although not true communication, enables bats, dolphins, etc. to locate their food by emitting sound that is then reflected back from the food source to them.

Animal communication can also be conducted chemically. The olfactory sensibilities of animals can unlock many secrets of communication from animal urine, feces, and scent glands. Cats have scent glands on their flanks and foreheads that can help them identify each other and their territories. Many animals mark their territories with urine and feces so that possibly harmful physical confrontations with trespassing animals are avoided. Female receptiveness to mating can be chemically transferred among animals. Some predatory animals can gain information about the health and vigor of their prey animals by smelling the scent left by bodies, urine, and feces. Ants can leave chemical trails for the colony so that food can be located. Honey bees carry nectar in a “nectar pouch” back to the hive that identifies them as a member of their hive. Amoebas even seem to communicate

chemically. Our understanding of pheromones used in animal communication is just beginning to unfold.

Can plants communicate? Yes! If you consider the use of chemicals! Tannin imbedded in some plants will turn away insects before they try to dine on the plant. There has been some research to determine if plants do emit some form of communication other than chemically.

Another realm of communication that is just beginning to be studied is electro communication. Sharks, Rays, Lampreys, and some fish have electroreceptors on their bodies to perceive electrical impulses generated by other animals. This can enable them to locate objects and food in the murky waters of the sea. Some of these animals can actively generate electric fields to detect distortions and food in their habitat. Weakly electric fish can modulate their generated electric waveform to communicate with each other when finding a mate. Monotremes such as echidnas and platypuses have electroreceptor to locate their food. Could that mean they could also carry on electro communication?

Visual displays, though inaudible, communicate between specie members and between different species. Brilliant colors on male birds will attract females and advertise a healthy mate. Anoles flash their dewlaps in silent communication to protect their territories or find a mate. Bright warning colors on amphibians, as well as other animals, ward off would be predators. Flashes of color can work as a startling stimulus to catch predators off guard or to frighten them away.

Bioluminescence, in animals of the deep sea that possess chromatophores ( cells bearing pigment that can expand and contract in tissues), enables them to quickly change color to camouflage for defense, to get food, or signal each other. Octopi, squids, and cuttlefish can flash color change much faster than any other animals. Lantern fish seem to be able to recognize each other by these colorings. Bioluminescence can happen on land too! It can be seen in Lightning Bugs (aka. Fireflies, glow worms). A male lightning bug will flash a signal or pattern, to a female and if she chooses she will respond. When lightning bugs sense danger, they turn their light off, and fly up.

Do animals always tell the truth when they are communicating? Visually mimicking the color pattern or shape of another more dangerous or toxic animal can provide safety for some animals. Blending in or camouflaging colors enable animals to hide within their surroundings to avoid detection. Alligator Snapping Turtles have a “fishing lure” within their mouths. A small fleshy piece of tissue that resembles a worm wiggles in the water as the Turtle’s mouth gapes. Fish are lured in by the “food” and become an easy catch for the Snapping Turtle.

At times visual displays of certain behaviors are a form of silent communication. Visual displays, which often must follow prescribed patterns during courtship, may determine the success or failure of mating between

many members of some species. Many times pair and group bondings are cemented by silent ritualized behaviors. Thompson’s Gazelles display a pursuit deterrent behavior by running and leaping very high in the air. “Stotting” tells all potential predators- “you will need to expend a lot of energy to catch and eat me!” The “Waggle Dance” Honey Bees display in the hive is believed to communicate the exact location of food for the rest of the bees in the hive. Submissive behavior in social animals will do much to avoid injury for individual animals and it can order the animals’ society so that the group as a whole can survive.

Among many animals, especially primates and canines, facial expressions can communicate aggression, fear, threats, willingness to play, etc. These often very quickly changing displays do much to keep social groups in tact, avoid harmful physical confrontations, and teach youngsters the “manners” of group life.

A very new and provocative study of animal communication explores Metacommunication. Are animals communicating in ways other than those that humans have observed and recorded? Are these communications transcending the forms of communication known to man? Are there ways animals can communicate that are beyond our traditional understandings? All of these questions will provide interesting scientific study and may reveal astonishing insights into our natural world.

## Vocabulary

*Adaptations-* (noun) - Something that helps an animal survive.

*Audible-* loud or clear enough to be heard

*Behavior-* Activity or change in relation to an environment; the way an organism acts in response to a stimulus.

*Bioluminescence-* the generation and emission of light by organisms such as fireflies, some bacteria and fungi, and many animals that live in the ocean

*Cephalopod-* octopids, squids, mollusks that possess a foot modified into arms that surround a head

*Chromatophores-* a pigment-containing cell in many animals that, when it expands or contracts, causes a change in the animal's skin coloring. Octopus, squid, and some frogs and lizards contain these cells.

*Communicate-* to transmit or reveal a feeling or thought by speech, writing, or gesture so that is easily understood

*Communication-* the exchange of information

**In Animals-** any behavior on one animal's part that has an effect on the current or future behavior of another animal

*Display-* A means of attracting attention.

*Disruptive coloration-* color pattern that helps break the outline of organisms

*Electroreceptors-* an organ in fish such as sharks, electric eels, and catfish that detects electric charges

*Inaudible-* not loud enough to be heard

*Metacommunication-* communication that is beyond traditional communication previously understood

*Mimicry-* The superficial resemblance which some animals exhibit to other animals or to the natural objects among which they live; thereby, securing concealment, protection or the like.

*Pheromones-* a chemical compound produced and secreted by an animal that influences the behavior of other members of the same species

*Photophores-* a luminous light organ on many deep-sea and some nocturnal fish, squids, and shrimps

*Scent marking-* using a smell produced by the body to identify territory or ability to mate

*Survival-* Living or continuing longer than something else.

## Assessment

The classroom teacher can assess the student's progress by observing the students during the program and by performing at least one of the extensions.

*Unsatisfactory-* student seems uninterested, does not participate, and does not answer questions.

*Satisfactory-* student seems somewhat interested, participates to some degree, and attempts to answer questions when asked

*Excellent-* students seem very interested; participate willingly in all activities, and answers questions. Student offers his or her own questions.

## **Extension**

### **The Nose Knows!**

Dip one pair of cotton balls in the same scent. Have several pairs with different kinds of scents (dish soap, a variety of kitchen spices, etc.) Place them in individual film canisters with holes in the lids. Distribute the cotton ball scented canisters and disperse the pairs to different students.

Now can the students find their “partner” scent among all of the other scents? Caution them to keep their noses off of the canisters.

Once their partners are found discuss why it is beneficial for animals to use scent to stay safe, find a food, a mate or an offspring and to communicate inaudibly. Also discuss if they found the task difficult. Why or why not?

### **Amphibians Calling!**

After listening to frog calls (in the wild or online) have the students reproduce those sounds in print on Frog Calling cards. Make matching/twin pairs. Now give each student or small group of students a Frog Calling Card which has a Frog Call written on it. Ask each student to “practice” reproducing the Frog Call. Have a brief discussion about how important it is for a Frog to find a mate. How can this be done in or near water? How could this be done at night?

Now ask the students to disperse around the room. On signal, have all of the students reproduce the sound on their card and KEEP reproducing it! Can they find another “Frog” who has the same call as theirs? Among all of the different continuous calls can they find their “mate”? Have the students discovered how Frogs find their mates?

### **So Do You Want to Join a Dance Contest?**

After discussing courtship dances and the “Waggle Dance”

<http://www.youtube.com/watch?v=-7ijl-g4iHg>. ask your students to create their own “dance”. Decide what is important for them to communicate- “I need a ride to practice”, “I need more allowance”, “I haven’t even studied for this quiz yet and I need help!”. Now have the students “display” their communication. As a group decide whose inaudible communication was the most successful!

### **Silence!**

Challenge your learners to spend an hour, a morning, a day, without using their voice to communicate. How did they communicate? Discuss what they found. Perhaps they can journal their experiences.

Once they have experienced one type of silence now ask them to find a quiet spot outside and experience all of the natural sounds. How long can they sit quietly? What did they find? Can they journal about that time when they did not communicate but perhaps heard other living things communicating? Can they journal again and compare the two experiences?

### **Learn a Different Way**

Investigate American Sign Language (ASL). Invite an Interpreter to your class. Meet someone with a hearing loss or someone who is deaf. Is their life and communication different than yours?

### **Resources**

Ganier, Anita. Questions and Answers About Animal Talk. Aladdin Books, New York. 1991.

Hauser, Marc and Konish, Mark. The Design of Animal Communication. Bradford Books, 2003.

Louv, Richard. Last Child in the Woods: Saving Our Children From Nature Deficit Disorder. Alogonquin Books, 2005.

Mc Ewen, Bruce and Elizabeth Norton Lasley, The End of Stress As We Know It. Dana Press, Joseph Henry Press, Washington, D.C., First Edition. 2002.

Page, George, Inside the Animal Mind. Random House, New York. 1999.

#### *Articles*

Dornin, Rusty, "There's More to Animal Communication Than Meets The Ear" CNNinteractive.cnn.com

#### *Websites*

ALA's Great Websites for Kids: Animals <http://www.ala.org/gwstemplate.cfm?section=greatwebsites&template=/cfapps/gws/displaysection.cfm&sec=1>

Awesome Library – Kids <http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html>

Awesome Library – Teachers <http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html>

Cincinnati Zoo & Botanical Garden [www.cincinnati-zoo.org](http://www.cincinnati-zoo.org)

ENature [www.enature.com](http://www.enature.com)

Internet Public Library/Kidspace/Animals (comprehensive listing) <http://www.ipl.org/kidspace/browse/mas4500>

[mnsu.edu/emuseum/cultural/language/chimpanzee](http://mnsu.edu/emuseum/cultural/language/chimpanzee)

National Geographic: Animals <http://www3.nationalgeographic.com/animals/>

<http://www.youtube.com/watch?v=-7ijl-g4jHg>  
See the Bee Waggle Dance.

<http://www.nature.nps.gov/naturalsounds/> - project to record natural sound in wild places and offers some examples