

# Call of the Wild – The Sounds of Nature

Bonnie Anderson

Students will draw comparisons from how people send and receive sound vibrations and how animals do. Using animal calls, habitats will be explored to see what will call back.

## Grade 4

### Curriculum connections:

#### Matter and Materials - Materials that transmit, reflect or absorb sound.

##### Specific Expectations

##### Understanding Basic Concepts

- investigate, through explorations, ways in which different properties of materials, including their shape, affect the nature of sound (e.g., compare the sound produced by striking solid and hollow materials);
- identify and describe, using their observations, physical changes in a material that can alter the sound it makes (e.g., the differences in sound when a loose rubber band and a stretched rubber band are plucked);
- identify, using their observations, a variety of materials through which sound can travel (e.g., by ringing bells under water; by sending messages along a string).

##### Developing Skills of Inquiry, Design, and Communication

- design and make instruments for a specific purpose or function (e.g. make drums from boxes or margarine containers with lids);
- formulate questions about and identify problems related to the ways in which materials transmit, reflect, or absorb sound, and explore possible answers or solutions (e.g., predict and verify the types of materials that will make ringing sounds when struck);

##### Relating Science and Technology to the World Outside the School

- compare materials in terms of the sounds that they can be made to produce (e.g., by plucking a rubber band, beating a drum, tapping glasses filled to different levels with water, shaking a jar of macaroni, blowing air past a blade of grass placed between the thumbs);
- investigate objects in the home and community that are designed and made to produce sounds (e.g., doorbells, sirens, telephones, radios, stereos, smoke detectors, security system alarms);

#### Energy and Control - Sound Energy

##### Specific Expectations

##### Understanding Basic Concepts

- group a variety of sounds according to pitch and loudness and demonstrate how the sounds can be modified;
- compare the range of sounds that humans can hear with the range of sounds that other animals can hear (e.g., dogs and cats can hear higher frequencies than humans);
- recognize that sounds are caused by vibrations;
- describe how the human ear is designed to detect vibrations.

##### Developing Skills of Inquiry, Design and Communication

- formulate questions about and identify needs and problems related to their own experiences with light and sound, and explore possible answers and solutions (e.g., identify different sounds and their sources in their environment);
- design and make musical instruments, and explain the relationship between the sounds they make and their shapes;

##### Relating Science and Technology to the World Outside the School

- identify various uses of sounds encountered daily (e.g., warning sounds such as security alarms, fire sirens, smoke detector alarms);

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##### (5-10 min) 1. Rainstorm

Have the students sit quietly in a circle or similar space. Start at one end with a progression of hand and leg noises to create a sound scape in the area. (fingers rubbing, snapping, hand rubbing, clapping, thigh rubbing, slapping, foot stomping and then reverse order back to silence. ) Discuss the experience of hearing sound that mimics natural occurrences.

##### (5 min) 2. How do people hear sound?

- ✓ domino set, cup or plastic container – bottom removed)
- ✓ ice cream tub and lid, dental dams for drum, ear chart )

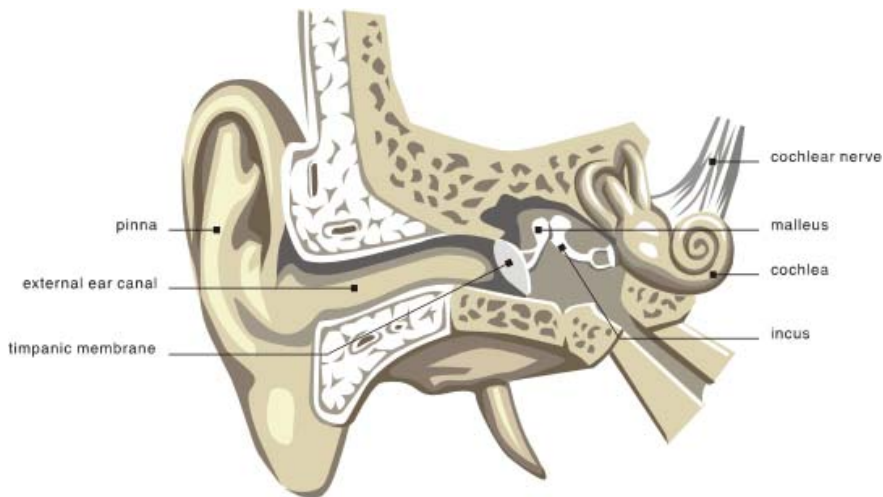
Like standing dominoes tipping over in a wave, sound moves in the air the same way. Individual dominoes do not travel from one place to another but the mechanical energy is passed along in a chain. Sound travels through air the same way. The wave of energy passes from one molecule to another until it reaches your ears. It's not the air



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molecule that reaches your ears, only the energy in the form of sound vibration that does.

Hearing occurs when this mechanical energy is trapped by our ear flaps (pinnae) and transmitted into our inner ear. A complex process transforms that mechanical energy into electrical energy in the inner ear and is sent to the brain. In a part of the brain, the vibrations are interpreted as specific sounds.



To make an ear drum cut top out of lid leaving outer ring in one piece. Cut small hole in bottom centre of container. Use dental dam or balloon to cover top of container and use lid to secure to container. talk quietly into the bottom of the container and feel the vibration on the large balloon ear drum.

**(5 min) 3. How do people make sounds**  
Mechanical energy (movement) creates sound. This movement can be inside or outside the body. As long as vibrations are created, sound can be captured and heard. Either voice boxes, internal, or external movement can create sound.

Have students feel their voice box as they hum quietly to feel the vibrations they create. Remind the students of Helen Keller who even though she could not hear or see managed to learn how to talk by feeling the vibrations of others and trying to make those herself. Keller even managed to make it to college and went on speaking tours.

**(5 min) 4. Why do animals make sound**  
All living things make sounds for some reason. They are responses to various cues including presence or absence of temperature, light or humidity. They also make sounds according to other stimuli based on the following:

- aggressive calls – territory trespassers
- advertisement calls – mates and territory establishment
- courtship calls – breeding
- warning calls – attacking or being attacked
- amusement – something to do for fun

**(5 min.) 5. Where do we hear those sounds**  
Different habitats are preferred by different species. Seasonal and temporal changes will determine where success in hearing calls will occur. It is also a good indicator of community health that sound can be detected. Determining the return of species from migration or hibernation can also be done by sound easier than sight. Frogs in the spring and birds in the spring and fall are examples of how sound samples are used to show presence or absence of populations and can be determined even in areas hard to access or areas of high sensitivity for impact.

**(10 min.) 6. When do they make sounds**  
In small groups assign a card containing bird calls and time zones. Begin the game with a time of 3:30 am, and announce every half hour in short intervals. The groups should use their bird calls at the times on their card and continue calling until the stop time on the card. Props may be used, including a large clock on which the hands can be moved to demonstrate time.

Mating option: Have students in a covered area spread out and try to find each other using the birds calls and time zones. Students must only move during their time zone – one step per call. This shows the stress of being able to find a mate quickly and explains the level of frequency and intensity heard in nature.



(5 min.) **7. How do creatures make and hear sound**

There are as many different ways to make sound as there are creatures. Some use mechanical energy (movement) including a rattlesnake whos body develops a sort of rattle which is activated by external movement when the snake simply shakes its tail. Other sounds are created by internal movement with the use of a voice box; in this the sound is created by air passing through vocal chords.

Methods used to receive sounds can be as diverse as the methods for making them. Creatures have different receptors for sound. Some ears are fixed in one spot, but others have ears that can be moved in many directions in order to pinpoint sounds. Some, like fish have a lateral line to feel vibrations. Snakes, worms and moles have no ears at all but feel vibrations instead. Some insects feel vibrations with hairs on their legs or with antennae.

- Frog Calls** – wide elastic bands, pop bottles, combs, string of jingle bells, small rocks
- String an elastic band between two fingers and pluck it - green frog - boingboing
  - Blow into pop bottle – bull frog – mashed potatoes
  - Pull finger along comb – chorus frog – fried rice
  - Jingle bells on a string – spring peepers - tomatoestomatoestomatoestomatoes
  - Clicking rocks together – wood frog –



**Games:**

**Bat and Moth** – blindfolds or goggles, empty long sock or bopper

- Have class create a circle on a space of open flat ground.
- Have the bat wear a blind fold in the circle holding the sock bopper. The moth is also in the circle but not blindfolded.



**Animal Calls:**

Seasonal Options:	Fall	Winter	Spring	Note:
birds	X	X	X	mating in winter and spring
frogs			X	see frog chorus to learn calls
bugs	X		X	fall-crickets spring-mosquitos
mammals	X	X	X	deer, squirrel, fox/predator

**Make and take options:**

**Hootie Frooties** – 2 film canisters per student, tea lights (one per table), paper clip melter with tape oven mitt protectors ( 2 per candle) , masking tape, marker for names

- Light candles to heat up paper clips to melt 0.5 cm hole in one film canister at the bottom 0.5cm from edge. (pencil size hole)
- Tape end to end with another film canister that has no hole in it. This makes the sound chamber.
- Blow across the hole like a flute. Choose different patterns for different owls or mourning doves. (Who cooks for you, who cooks for y'all – Barred Owl – or Oh! No! What did I do? – Great Horned Owl)

**Grass Calls** – wide long pieces of grass (one per student)

- Use long piece of grass between thumbs of both hands to blow through. This mimics the vocal cords so students can change the tension of the cord and change the pitch of the sound vibration.

- The bat sends out it's echo location signal "bat" and the moth returns the signal "moth". The moth only responds when asked to by the bat.
- As the bat homes in on the moth it tries to catch it by hitting it with the sock bopper.
- When finally tagged the game ends and new players are picked to try again.

**Chippy Game** – blindfold or goggles, jingle jar or set of keys

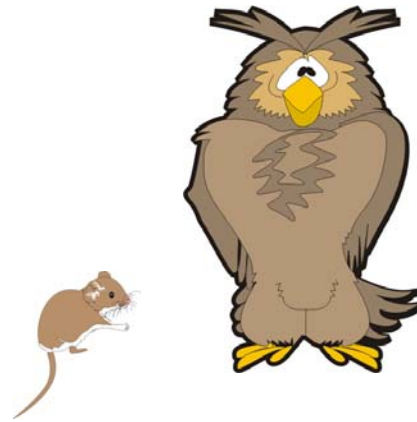
- Have group sit on ground in a circle.
- Pick one to be the chipmunk who sits in the centre with the blindfold on.
- QUIETLY, have mice try to sneak up on chipmunk to steal the noise maker or seeds from the chipmunk run.
- As the mouse sneaks up, Chipmunks try to point out where the source of noise is coming from. If they can point the source of noise they have caught the mice and new mice are picked to try again.



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- Owl and Mouse Game** – blindfold or goggles, jingle jar or set of noise makers
- Blind fold 2 to 7 students as owls.
  - Give 1 – 3 mice noise makers (not blind folded and can't move)
  - Mice make noise. Owls walk slowly to find mice.

If you don't have time for all students to have a turn – encourage them to play these back at school.



**Conclusion and wrap up:**

When a tree falls in the forest does it make a noise?? (only if there is a receptor for sound within the boundaries of the sounds ability to travel)

**Back at School Experiments:**

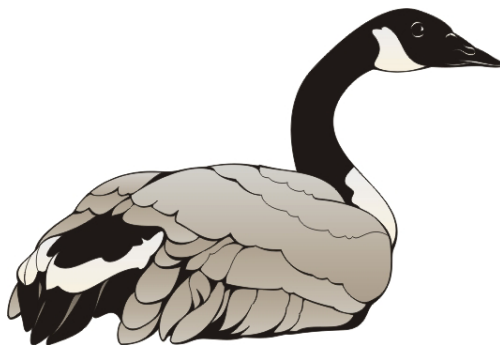
**The Umbrella Experiment** – (2 umbrellas, one analog watch – has hands)

- Open both umbrellas.
- Place them handle to handle about 2 m away.
- Put the watch on one end and you can hear it at the other end.

**Stringer**

- coat hanger on string
- thunder tubes

<b>Bird Clock cards</b>			
<b>Bird</b>	<b>Call</b>	<b>time am</b>	<b>time pm</b>
Olive-sided flycatcher	Quick! Three beer!	4:30 – 8:30am	4 – 7pm
Common Yellowthroat	Witchety-witchety-witchety-witch	7 – 12pm	3 – 8pm
Towhee	Drink your teaeeeee!	5 – 9am	5 – 8pm
white throated sparrow	Oh sweet CanadaCanadaCanada	6 – 10am	4 – 6pm
Blue jay	Thief thief thief	7 – 11am	3 – 7:30pm
Red-eyed Vireo	Where are you hiding – Up in a tree	7am	– 8pm
Chickadee	Chickadee-dee-dee	5 – 10am	4:30 – 6:30pm
Great horned Owl	Oh! No! What did I do?	4 – 6:30am	8 – 11pm
Phoebe	Fee – Bee	5 – 11am	3:30 – 7:30pm
Yellow Warbler	Sweet sweet I'm so sweet	4 – 7am	3 – 8pm
Chestnut-sided Warbler	Please please pleased to meetcha	4 – 9am	4 – 7pm
Ovenbird	Teacher teacher teacher teacher	6 – 11am	2 – 7pm



**Additional Bird Sounds**

- |              |                            |  |
|--------------|----------------------------|--|
| crow         | caaa caaa                  |  |
| dove         | cooo cooo                  |  |
| cardinal     | whoit whoit whoit          |  |
| robin        | cherriup cheerily cheeriup |  |
| Canada goose | ahonk [m] hink [f]         |  |

Bonnie Anderson, Kawartha Pine Ridge District School Board