



animal detective

★ *teacher's guide*

University of Nebraska State Museum

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Dear Colleague,

The Animal Detective Encounter Kit is designed to bring hands-on materials from the University of Nebraska State Museum as well as inquiry based activities to the classroom. It is our goal to introduce students to some common Nebraska mammals and birds by studying the clues that animal's skulls, tracks and other evidence provide. By providing students with these experiences it is hoped that they might become "Animal Detectives," searching, on their own, for evidence of the animal life around them.

The objectives of this Encounter Kit are for students to:

1. examine some of the types of evidence animals leave behind;
2. identify general characteristics of animal tracks and trails;
3. identify general characteristics of animal skulls;
4. learn that animals can be identified by their scent;
5. learn that animals can be identified by the sounds that they make.

The activities range in **length from 45 to 60 minutes**. Any class size is possible, but **groups of fewer than 30 students** are recommended.

Your input is greatly valued. Please assist us by completing the enclosed **Evaluation Form**.

We hope that you and your students enjoy learning to become "Animal Detectives." If you have any questions feel free to call (402) 472-6302.

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Encounter Kits

Encounter Kits are organized around a teaching-learning framework, which guides teaching and learning through four main stages.

STARTING OUT:

Usually a full group discussion. This provides an opportunity for you to stimulate curiosity, set challenges, and raise questions. Students share their knowledge and previous experience on the topic.

Teacher:

- Probes for current knowledge and understanding
- Motivates and stimulates activity
- Sets challenges and poses problems

Student:

- Shares thoughts and ideas
- Raises questions

ACTIONS:

Groups of students look closely at the phenomena or actively participate in actual scientific work. They work directly with materials. It is important to allow enough time for this inquiry stage, so that they can explore materials and concepts that are new and fully experience trial and error. This can be an investigation time as students discuss ideas together, try out activities and manipulate materials.

Teacher:

- Facilitates
- Observes

Student:

- Explores
- Observes
- Works as a team member
- Problem solves
- Records

TYING IT ALL TOGETHER:

Usually a full group experience, this stage provides students with the opportunity to share their discoveries and experiences. You guide them as they clarify and organize their thinking, compare their different solutions, analyze and interpret results, and attempt to explain the phenomena they have experienced.

Teacher:

- Questions
- Guides
- Assesses student understanding

Student:

- Interprets and analyzes
- Synthesizes
- Communicates
- Questions

BRANCHING OUT:

This optional stage allows the students to connect and relate learning from the kit activity into other projects and activities.

Teacher:

- Facilitates
- Assesses understanding

Student:

- Applies
- Questions
- Integrates

Contents of the Animal Detective Kit

Activity 1: The Case of the Sensitive Sniffers

- 30 Clue cards
- 6 Mammal pictures (Rabbit, Raccoon, Squirrel, Red Fox, Antelope, Bobcat)
- Film canister with skunk scent
- Film canister with red fox scent

Activity 2: The Case of the Curious Clues

- Beaver chewed log
- Owl pellets
- Antler
- Plant galls
- Porcupine quills
- Snake shed
- 7 Pictures (Beaver, Owl, Deer, Porcupine, Snake, 2 Plant Galls)

Activity 3: The Case of the Tricky Tracks

- 5 Sets of Nebraska Game and Parks' Project Wild Track Cards (52 cards per set)
- 5 *Wildlife Tracks* Booklet - From Nebraska Game and Parks' Project Wild
- Set of human animal tracks - hands and feet
- 5 Sets of Plastic animal tracks
- *Animal Tracking and Behavior - Stokes Nature Guide*

Activity 4: The Case of the Talking Skulls

- Beaver skull
- Mink skull
- Coyote skull
- Shrew skull
- 2 Skull Parts posterboards
- Mammal Food Habits posterboard
- 3 Animal pictures (Mink, Coyote, Shrew) (Beaver Picture is in "Curious Clues")
- Thirteen-lined Ground Squirrel skull
- Thirteen-lined Ground Squirrel study skin
- Peripheral vision activity sheet
- Play Dough Recipe

Activity 5: The Case of the Noisy Neighbors

- 10 Pairs of noisemakers
- 1 Deer call
- 1 Turkey call
- Turkey and Deer Call Instructions
- Coyote songs tape
- 2 Predator cards
- Sound Off! activity sheets

References

- *NatureScope Mammals - Part I*
- Teacher's Guide

Animal Detective Book References

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Activity One – The Case of the Sensitive Sniffers

Learning Objective:

Students learn to follow a scent trail.



Squirrel photo by Maria Corcacas/stock.xchng

Activity One - The Case of the Sensitive Sniffers

Group size: Any; divide into 6 small groups

Time: 45 minutes

Materials Provided Per Class:

- 30 Clue cards
- 6 Mammal pictures
- Film canister with skunk scent
- Film canister with red fox scent

Additional Supplies Needed Per Class:

- 1 Roll of scotch tape
- 6 Small paper cups
- 36 Cotton balls
- 6 Bottles of different liquid flavoring extracts - such as peppermint, anise, coconut, almond, orange, lemon, vanilla or maple

Additional Supplies Needed Per Student:

- Paper
- Pencil
- Clipboard *Optional*

Preparation:

- Group the clue cards so that the five clue cards for each animal are together. (*Numbers written on the back of the cards will assist you in this task. Squirrel-1, Raccoon-2, Antelope-3, Red Fox-4, Bobcat-5, Cottontail Rabbit-6*)
- Pick 6 scents to use for the sniffing trail. Similar scents like orange and lemon make the game more of a challenge. (*Note: Some flavorings will color the cotton ball. Try to avoid using these flavors as the color clue will provide an unfair advantage.*)
- Soak 6 cotton balls in each scent. (*6 peppermint, 6 coconut, etc.*)

Preparation (cont):

- Using a small amount of scotch tape, attach each cotton ball of the same scent to the 5 clue cards for that mammal. Place the sixth cotton ball of each scent in a small cup, to be used as a “sample” scent later.
- Select a trail, indoors or out, that will be easy for the students to follow.
- Set up five stations along that trail.
- At station 1, place the six habitat clues; station 2, the food clues; station 3, the description clues; station 4, the reproduction clues; and at station 5, the special facts clues.
- Write the names of the 6 animals (*squirrel, raccoon, antelope, red fox, bobcat, cottontail rabbit*) on the chalkboard if you have younger students.

Background:

Humans and other animals leave their “odor signature,” or scent, everywhere they go. Many animals leave their scents on everything they touch and this odor lasts long after the animal is gone. An animal’s urine or feces is a concentrated source of its scent. Information such as the animal’s age, size, reproductive condition and sex can be determined by studying these products.

Some animals such as skunks, goats and deer, have specialized scent glands that produce substances that these animals use to mark their territories and defend themselves.

Many animals make use of their keen sense of smell to locate food, track prey, find mates, sense predators, and keep track of their young. Many mammals are known as being scent trackers, tracking their prey by following its scent. Scent trackers have an extremely sensitive sense of smell. Some examples of scent trackers are wolves, badgers and weasels. Members of the dog family (wolves are in this family) have a sense of smell that may be a million times more sensitive than humans.

Starting Out

- Open up the film canister with the fox scent in it and blow across it to let the students carefully smell it.
- Ask the students: How do predators, like wolves, find their prey?
Which senses are most important to a predator? To its prey?

Action:

1. Have each student get out paper and a pencil. *(Optional: Hand out a clipboard to each student.)*
2. Divide the class into 6 groups. Assign a letter to each group (A,B, etc.)
3. Have each group number off. This will mean that each student will be a member of group A, B, etc. and also be a number 1, 2, etc.
4. Ask the students to write at the top of their paper which group and number they are so that they can remember.
5. Tell the students: "Each group will be hunting a different "prey." Pretend that you are the predator. The "prey" are mammals who might be eaten by you."
6. Tell the students: "To discover your group's mammal, each of you will have to follow a scent or smell trail."
7. Give each group a cup with a scented cotton ball that corresponds to the smell for their prey.
8. Ask them to memorize this smell because they will need to know it to figure out which animal is their prey.
9. Tell the students: "At each station you will find six different smells on cotton balls. You need to sniff the cotton balls until you can figure out which one is your group's smell. Then copy the clue that is written beside that smell onto your own paper. You will have 5 minutes to determine which smell is yours and to write down the clue."
10. Take them to the trail.
11. Tell the students: "Each person needs to go to each of the five stations to figure out the clues for their group's mammal. You should not be at any one station with another person from your group."
12. Send all the ones to Station one, the twos to Station two, etc.
13. After 5 minutes, call out that the ones should go to Station two, the twos to Station three, etc. Continue to switch the students until all have been to each station.
14. When all group members have visited all the stations have them get together and, as a group, decide which animal was their prey, choosing from the animals listed on the chalkboard if you decided to make it easier for them.

Tying It All Together:

Ask the following questions:

- Were the scent trails easy or difficult to follow? Why?
- Did everyone in your group end up with the same clues? What caused the problem?
- What parts of this tracking game are realistic? Which parts are not?
- As animals grow older their sense of smell becomes less sensitive. What problems might this cause for a predator? For prey?
- How would your life be different if you had a sense of smell as sensitive as a wolf?
- In this activity scent was used to track "prey". What are other ways animals can use their scent? To give them some ideas, open the film canister with the skunk scent and blow across the top of it so that the students get a whiff.

Branching Out:

- Using 6 different animals, have the students make their own set of clue cards and repeat the game.
- Go outdoors and search for non-human tracks and scents. Try to follow them. Where do they go? What animal made them?

Activity Two – The Case of the Curious Clues

Learning Objective:

Students will examine evidence of animal life and attempt to identify it.



Activity Two – The Case of the Curious Clues

Group size: Any; divide into 6 small groups

Time: 40-60 minutes

Materials Provided Per Class:

- Beaver chewed log
- Owl pellets
- Antler
- Plant galls
- Porcupine quills
- Snake shed
- Set of animal pictures
- *NatureScope Mammals - Part I*

Additional Supplies Needed Per Student:

- Piece of paper - divided into 6 sections
- Pencil

Preparation:

- Place the 6 pieces of animal evidence at stations around the room.

Background:

This activity invites students to be animal detectives, using what they know about animals, to figure out the origins of animal evidence. The objects included with this activity are all evidence of animal life, and were once part of, or were created by, animals. We can look at this evidence of animal life just as a lawyer might look at circumstantial evidence in a court case. Circumstantial evidence, by definition, is evidence from which other facts can be inferred. As the animal evidence is examined, inferences can be made as to the type of animal that produced the evidence and its lifestyle.

Animal evidence, “clues,” in this kit are:

Beaver chewed log: Beavers are members of the rodent family. Rodents have long chisel-like incisor teeth that grow continually throughout their lives. These teeth are kept sharp by gnawing on wood and other plant food.

Owl pellets: Usually owls swallow their prey whole. If the prey is too large to be swallowed whole it is torn into pieces and swallowed. Fur, bones and feathers cannot be digested by the owl. Pellets of this indigestible material are regurgitated, or thrown up by the owl. The size, shape and contents of the pellets provide clues as to both the prey animals and their predator.

Deer antler: Deer lose their antlers each winter. In the spring new ones start to grow. By fall the velvety skin that covers the antlers is gone and the antlers are tall and sharp. The male fights other males, using his huge bony, branched antlers. Each year antler growth is larger than the previous year. Few shed antlers are found in the woods, because they are eaten by small animals or crumble from exposure to the weather.

Snake shed: A snake continues to grow throughout its life. Every couple of months it outgrows its skin. As this happens a new layer of skin forms underneath the old outer layer. The snake then snags this outer layer on a rough branch, log or rock. As it slowly wiggles forward the old outer skin peels off, and is turned completely inside out. This old skin is called a snake shed.

Plant galls: The abnormal growths on these plant stems are called galls. Galls are caused by insects laying their eggs in the tissue of the plant. As eggs hatch, plant tissue around the larva swell, forming a gall. The gall provides a protective home for the insect within it. Each species of gall-making-insect chooses a particular type of plant on which to lay its eggs. The specimens and picture included in this kit are from a goldenrod stem. It is made by a fly. If the gall is opened when fresh, a fat little grub would be found inside.

Porcupine quills: Although porcupines quills detach easily, it is a myth that the porcupine can shoot them. When a porcupine feels it is in danger of an attack it will back into its attacker and leave quills sticking into its attacker’s skin. The quills are very sharp, with a small barb (hook) on the end. This makes them painful to remove. If left, the barbs can work their way further inside and can damage vital organs.

Starting Out

Ask the students:

- When detectives try to find a robber what do they look for?
- If you were on a nature walk, looking for animals, and didn't see any, how might you find out if there were any animals in the area?
- What kinds of clues might animals leave behind?

Action:

1. Divide the class into 6 groups.
2. Place one group at each of the animal evidence stations.
3. At each station, have the group discuss the animal evidence.
 - What is it?
 - What animal is it evidence of?
 - Was it a part of the animal or did the animal create it?
4. Have each student in the group make a sketch of the evidence. The sketch should show the evidence as a part of an animal or being created by an animal.
5. After about 5 minutes rotate the groups to another station.
6. After the groups have been to all 6 stations return the animal evidence to a central location.

Tying It All Together:

- Holding up one of the pieces of animal evidence repeat the questions that were asked at the stations.
- Ask for volunteers to show their sketches.
- Have the class vote on which picture goes with which piece of evidence.
- Ask the students:
 - What other kinds of evidence might animals leave?

Branching Out:

- Have the students write a story about one of the pieces of evidence.
- The story should explain:
 - What the object is.
 - Where the animal that produced it lived.
 - How the animal made use of the object.
- Go on a "Mammal Safari". This activity can be found in the *NatureScope Amazing Mammals Part I* (included in this kit).



Activity Three – The Case of the Tricky Tracks

Learning Objective:

Students learn characteristics to look for when “reading” animal tracks.



Activity Three – The Case of the Tricky Tracks

Group size: Any; divide into 5 small groups

Time: 45 minutes

Materials Provided Per Small Group:

- Set of 52 Nebraska Game and Parks' Project Wild Track Cards (5 sets included)
- *Wildlife Tracks* - A booklet from Nebraska Game and Parks' Project Wild (5 included)
- Plastic animal tracks (5 sets included)

Additional Supplies Needed Per Small Group:

- Ink pad
- Paper

Materials Provided Per Class:

- Set of human animal tracks - hands and feet
- *NatureScope - Mammals Part I*
- *Animal Tracks and Behavior (Stokes Nature Guide)*

Preparation:

- Set up five stations/areas around the room so that each small group of 4 to 5 students will have approximately 4 square feet of work space on a table or the floor.
- Try the card game yourself before having your students do it.

Background:

As an animal walks, runs, hops or crawls it leaves its footprints, or tracks. After a little study students can learn to identify an animal by its tracks. Animal tracks and trails (a series of tracks from the same animal) can provide us with a lot more information than just the identity of their maker.

For instance, studying an individual animal track can give us information about an animal's preferred habitat and lifestyle. Webbing on an animal's foot would indicate an animal that makes its home in or near water (ducks, geese, beaver). Another lifestyle indicator would be claws. A badger, for instance, seems best suited for digging for food and shelter with the large claws on its front feet.

The length of an animal's stride (distance between two consecutive tracks) gives us an indication of the animal's size. A short stride would indicate an animal with short legs while a long stride would indicate the opposite. For example, think about the difference in the strides of a turtle and a deer.

By studying the stride we can also determine how the animal was moving (hopping, walking, etc.) and also how fast it was moving. Direction of movement can be determined by studying individual tracks for the toe impressions.

Note: The "Track Learning" chapter of the *Stokes Nature Guide*, included in this kit, provides more detailed explanations of how we can learn about animal behavior by the study of animal tracks and trails. Also, the *Wildlife Tracks* booklet that accompanies this kit describes each of the animals the students will be attempting to match with the track cards.

Starting Out

Ask the students:

- What is an animal track?
- Do all animals make the same type of track?
- How can you tell them apart?

Action:

1. Show the human tracks to the class.
2. Ask a volunteer to arrange them as they would be found if made by a human traveling on “all four.” Allow the class to help with suggestions.
3. Divide the class into five small groups.
4. Give each group one set of animal track cards.
5. Have the students separate and spread all the cards on their workspace.
6. Tell the students:

“These tracks represent 14 animals. Some have 2 feet and some have 4. Your task is to figure out which tracks belong to each animal. Place them on the table/floor as if the animal had made them there (left and right, front and back, correctly placed).”
7. When the students have completed this task give them a copy of *Wildlife Tracks*.
8. Ask them how many sets of animal tracks did they have correctly placed? Students should look closely to be sure they have left/right and front/back tracks in their correct places. When they have completed their check, have each group pick up their cards and return them to the kit.
9. Have the students study the animal trails shown in the back of *Wildlife Tracks*.
10. Give each group a set of plastic animal feet from the kit.
11. Have them, as a group, make up a story about the animal whose “feet” they were given. Using the feet/tracks and an ink pad (can also use water and the blackboard) have them “tell” the story on paper. (Sample story - The pheasant was eating grain. It saw a coyote and ran away.)

Tying It All Together:

- Ask the students:
 - What can/did you learn about the animals from their tracks?
 - What was the largest animal making tracks? Did it have the largest tracks?
 - What was the smallest animal making tracks? Did it have the smallest tracks?
 - How did you decide which were front and hind footprints? Left and right?
 - How did you decide which footprints came from 2 footed animals and which came from 4 footed?
 - What can you learn about an animals behavior by studying its trail?

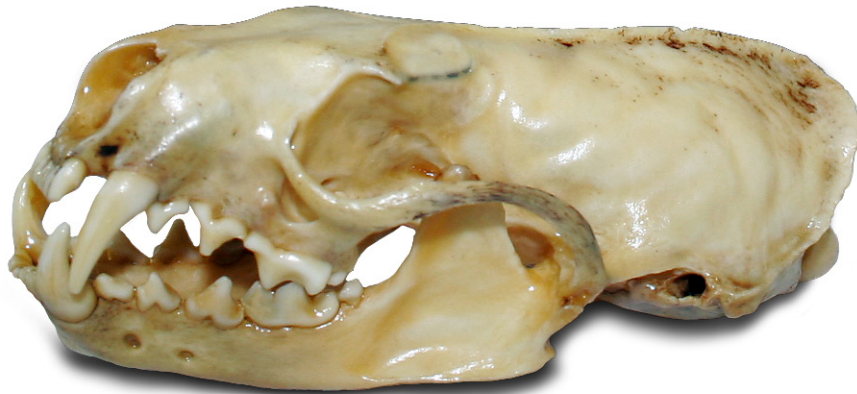
Branching Out:

- Have the students draw a picture and write a story (using words this time) about the animal whose trail they made.
- Do the “Tricky Tracks” activity found on page 45 in *NatureScope - Amazing Mammals Part I* (included in this kit).
- Learn more about animal tracks and trails from the “Track Learning” chapter in the *Stokes* book. For example:
 - Show students the rabbit trail variations, pages 34-36, in the “Track Learning” chapter. How does the rabbit place its feet when its moving slow? When it’s moving fast? Have the students attempt to move like the rabbit. Study other animals trails, and attempt to move like those animals.

Activity Four – The Case of the Talking Skulls

Learning Objective:

Students will learn to observe and “read” information from skulls as they make clay models of them.



Activity Four - The Case of the Talking Skulls

Group size: Any; divide into 4 small groups

Time: 60 minutes

Materials Provided Per Class:

- Beaver skull
- Coyote skull
- Thirteen-lined Ground Squirrel skull
- Thirteen-lined Ground Squirrel study skin
- Skull parts posterboard
- Mammal food habits posterboard
- Animal pictures
- Peripheral vision activity sheet (From Exploratorium's *Snackbook*)
- *NatureScope Mammals Part I*
- Mink skull
- Shrew skull

Additional Supplies Needed Per Student:

- 1-2 Cups of clay or playdough
- Pencil, popsicle stick, or toothpick

Preparation:

- Purchase or make enough clay for each student.
- Gather together enough pencils, popsicle sticks, or toothpicks so that each student has some implement with which to use for sculpting the clay.
- Place the skulls from this kit in a central location so that the entire class can see them.

Background:

Mammals come in many different shapes and sizes. Each mammal has a characteristic skull shape suited to its

surroundings and way of life. Skulls are a collection of clues about how the animal lived and fed. Easily identified parts include: eye sockets, snouts, nostrils, mouths, jaws, teeth and cheekbones. Studying each of these parts on an individual skull can give us information about its owner's lifestyle.

Some examples:

Eyes: Eyes of prey mammals are located towards the side to increase their field of view. Eyes of predatory mammals are located towards the front of the head to increase their depth of view or stereoscopy. Large eye sockets mean that the animal has large eyes. Large eyes helps the animal to see better. Pronghorn antelopes have large eyes which help them to see a long distance. Animals that hunt at night have large eyes to see better at night.

Nose: A long snout might suggest an animal that hunts by catching the scent of its prey or probing for nectar.

Jaw: A long thin jaw with small teeth may be useful for probing and nibbling on small items. A short broad jaw with large back teeth has more crushing power.

Teeth: A mammal's teeth are an excellent clue to identifying its diet. Teeth are specialized tools. Each animal has teeth suited to its own needs and basic diet. Mammals can be classified into four groups based on their diet.

Herbivores are mammals that eat mainly plant matter such as grasses and leaves. The grinding teeth of an herbivore have broad surfaces with cusps that have formed into ridges. Because plant matter is difficult to digest in the stomach and intestines, it is important for these animals to grind their food well before swallowing.

Carnivores are mammals that eat mainly meat. The teeth of a carnivore have sharpened cusps for cutting, ripping and tearing the flesh of their prey.

Insectivores are mammals that eat mainly insects. Insectivores have sharp pointed teeth with cusps that form a W, like pinking shears.

Omnivores are mammals that eat both plant and animal matter. Omnivores have teeth with low rounded cusps that allow both the cutting and crushing of food.

Starting Out

Ask the students:

- Where is your skull?
- Have you ever found an animal's skull while hiking?
- How did you know it was a skull?
- How are these skulls similar? Which parts are the same on all of them?
- How are they different? What parts do you notice are different?
- What can a skull tell you?

Action:

- Place the coyote, beaver, squirrel, and mink skulls from this kit at stations around the room.
- Divide the class into 4 groups (5 groups if you want to use the shrew skull - although because of its size this one might be difficult to model.)
- Place a group of students at each station.
- Give each student a lump of clay and an implement to sculpt with.
- Have all the students at each station sculpt a replica of their given skull. (The skull need not be life size. The main idea here is for the students to make close observations on one particular skull - to become an expert on their skull.)
- When the students have completed their sculptures, return the skulls to a central location.
- Have each student switch sculptures with someone from another group.
- Have the students attempt to place the replica skulls next to their originals.
- Ask if anyone had any problems placing a skull? Why?

Tying It All Together:

Having each group act as "experts" on their skull discuss the following:

- What can the skulls tell us about how the animal lives?
- What does the size of the skull tell about the animal?
- Discuss/identify the different parts of the skulls, using the posterboard to help.
- How does the placement of these parts affect the animals lifestyle?
- Have the students identify the different types of teeth on their skull.
- What might this animal eat? Plants, meat, or both? How do you know?
- Have the students match the skulls to pictures of the live animals they came from.
- Compare the squirrel skull to the squirrel study skin. What types of information can be gained from each?

Branching Out:

- Do the "A Menu for Mammals" activity, page 41 in *NatureScope Amazing Mammals Part I*.
- Using the peripheral vision activity sheet from the Exploratorium's *Snackbook* for guidance, have the students trace their visual fields and compare them to the visual fields of other animals. Construct a mask of an animal and trace its visual field.

Activity Five – The Case of the Noisy Neighbors

Learning Objective:

Students will learn that animals can be identified by the sounds that they make.



National Park Service photo by Bryan Harry

Activity Five – The Case of the Noisy Neighbors

Group size: Any

Time: 45 minutes

Background:

See OBIS “Sound Off!” activity background.

Materials Provided Per Class:

- 1 Pair of noisemakers for each pair of students (10 pairs are provided in this kit.)
- 1 Deer call
- 1 Turkey call
- Coyote songs tape
- 2 Predator cards

Additional Supplies Needed Per Student:

- 1 Blindfold that does not restrict hearing or a brown paper sack

Preparation:

- Read Preparation section in OBIS “Sound Off!” activity. Some noisemakers are provided in the kit.

Starting Out and Action

- Follow Action instructions in OBIS “Sound Off!” activity.

Tying It All Together:

- Use “More Sounding Off” questions from OBIS “Sounding Off!” activity.
- Use the following questions to focus on using animal sounds to become an animal detective:
 - ~ In this game the sense of hearing was used to find a mate or prey. What are other reasons that animals “sound off”?
 - ~ In this game man-made sounds were used to identify “animals”. What types of sounds are used to identify animals “in the wild”?
- Demonstrate the deer and turkey calls as examples of identifiable sounds.
- To demonstrate to the students that they can identify some common animals by sound alone, ask them to make the sounds of animals, such as: a frog, an owl, a cat, a dog, etc.

Branching Out:

- Learn to identify common birds by their songs.
- Listen to the tape of coyote “songs”.

Nebraska Science Standards

Activity 1: The Case of the Sensitive Sniffers

Objectives: Students learn to follow a scent trail.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Characteristics of Living Organisms: SC 2.3.1.c Identify external parts of plants and animals.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Investigations: SC 5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Characteristics of Living Organisms: SC 5.3.1.b Identify how parts of plants and animals function to meet basic needs.

3. Flow of Matter and Energy in Ecosystems

SC 5.3.3 Students will describe relationships within an ecosystem.

Ecosystems: SC 5.3.3.c Recognize the living and nonliving factors that impact the survival of organisms in an ecosystem.

Activity 2: Curious Clues

Objectives: Students will examine evidence of animal life and attempt to identify it.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

Scientific Communication: SC 5.1.1.g Share information, procedures, and results with peers and/or adults.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Activity 3: Tricky Tracks

Objectives: Students learn characteristics to look for when “reading” animal tracks.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Data Collection: SC 2.1.1.e Collect and record observations.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Data Collection: SC 5.1.1.e Collect and organize data.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Activity 4: Talking Skulls **Objectives:** Students will learn to observe and “read” information from skulls as they make clay models of them.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

Scientific Communication: SC 5.1.1.g Share information, procedures, and results with peers and/or adults.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Activity 5: Noisy Neighbors **Objectives:** Students will learn that animals can be identified by the sounds that they make.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

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