

**TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT**

Living on the “Edge”

Grade Level: 7th

Time required: 5 Class Periods

SC Science Standards

This lesson plan was correlated with only the grade level specified unless otherwise noted.

- I. A. 1. a. 1
- I. A. 1. b. 2
- I. A. 1. c. 1
- I. A. 1. d. 1
- II. D. 1. a-d
- II. D. 3. b

Purpose

The students will learn to identify and describe ecotones (such as between a field and a hardwood/pine forest). They will explore the differences in habitat requirements of different animal species and gain understanding of the importance of ecotones to biological diversity. The students will also learn how to create scent stations and make plaster casts of animal tracks as ways of identifying wildlife species and assessing animal abundance and diversity.

Skills

Comparing, identification, measurement, observations, prediction, research, synthesis.

Concepts

Identification of various SC mammals using animal track keys; effect of habitat components on wildlife abundance and species diversity; influence of generalized or specialized nature of habitat requirements on wildlife abundance; importance of ecotone (edge) to wildlife diversity.

Materials Needed

paper	Plaster of Paris
pencils/pens	spray shellac
garden hoe	Vaseline
rake	sandpaper
agricultural lime	empty 2 liter plastic bottles
peanut butter	5 gallon bucket (to carry lime)
ruler	meter stick
<u>South Carolina's Furbearers</u>	<u>Peterson's Guide to Animal Tracks</u>

Definition of Terms

<u>Cover</u>	Any material that provides protection to an animal (usually vegetation).
<u>Ecology</u>	Study of the relationships of living things to one another and their environment.
<u>Ecosystem</u>	All living and non-living things in a given area functioning as a system.
<u>Ecotone</u>	The transition zone between two structurally different plant communities.
<u>Edge</u>	The border between two different communities.
<u>Habitat</u>	An area that provides an animal or plant with adequate food, water, shelter, and living space in a suitable arrangement.
<u>Interspersion</u>	The distribution of different types of species among each other.
<u>Niche</u>	The location and function/role of an organism in the ecosystem—what it does and where it does it.
<u>Predator</u>	An animal that hunts other animals for food.
<u>Prey</u>	Animals that are killed and eaten by other animals.
<u>Range</u>	The ecological region throughout which an organism of a specific species normally lives.
<u>Species</u>	Members of a group of animals that successfully interbreed under natural conditions.
<u>Wildlife</u>	All non-domesticated animals.

Before the Session

The teacher needs to choose an area that contains a field, a herbaceous/shrub zone, and a hardwood/pine forest in close proximity of each other. This area should be relatively large if multiple scent stations are to be used. The teacher should also obtain copies as needed of South Carolina's Furbearers from the SCDNR as well as Peterson's Guide to Animal Tracks at a local book store. Divide the class into 6 groups for scent station construction.

Background Information

Every animal has an ecological role to play, be it as predator or prey. Habitats are places where animals live. Many species of animals are versatile and can survive in a variety of habitats. Other animal species have much more specialized requirements and can only live in a particular type of place.

The area where two different habitats meet is called an edge, or an ecotone. It is a transition zone between the two different habitat types and greatly increases the habitat diversity. An example of an edge is where a forest meets an open field. This edge can be home to a variety of organisms that live in either of these two major habitat types (such as quail, rabbits, bobcats, rodents, and foxes) as well as another group of species that can only live in a habitat that contains the components peculiar to the particular type of ecotone. The absence of edge will result in a reduction in the number of species that could otherwise make this area home (less species diversity). Some of the animals one might find in these three habitat types are pictured in South Carolina's Furbearers brochure and Peterson's Guide to Animal Tracks.

The South Carolina Department of National Resources has used the scent station technique for assessing the abundance of wildlife since 1984. These stations usually consist of an area one meter in diameter that has been raked smooth. In locations where the soil is sandy no further site preparation is required. If the soil surface is harder or more clayey, it is usually covered with a thin layer of powdered lime to provide a smooth surface that will show tracks. In either case, an attractant of some type (food or scent) is placed in the center of the plot. Scent stations are usually constructed in the afternoon so they can be checked the following morning for signs of visitation by nocturnally active wildlife. This is a relatively inexpensive technique to obtain data on wildlife species diversity and indications of trends in population abundance.

Suggested Lesson Plan

Day 1

1. Lead discussion of concept of wildlife habitat and of various different types of habitats. Also discuss the different species of wildlife and plant life that are present in each.

2. Show slides or photos of different types of habitat and wildlife species common to each.
3. Introduce the concept of edge (ecotone) and discuss its importance.

Day 2

1. Take the students to an area close to your school that contains a forest (pine, hardwood, mixed hardwood/pine) that borders on an open field.
2. Have each student find a place to sit at least 20 ft. away from each other. Have them then sit quietly and listen/look for evidence of wildlife. Have them record their observations in their notebook.
3. Ask the students to identify the habitats, the edges (ecotones), and describe the evidence of wildlife. Have each student orally report their findings to the rest of the class. Facilitate this discussion.
4. Return the students to the classroom and introduce and lead a discussion of the concept of animal track identification. Pass out handouts on animals tracks and reference copies of South Carolina's Furbearers.

Day 3

1. Divide the students into 6 groups and return to the previously visited field site. (Make sure all equipment is taken.)
2. Discuss the procedure used to construct a scent station. Use one student group to demonstrate this process. Have them:
 - a). clear an area 1 meter in diameter with a hoe and/or rake;
 - b). then use the rake to smooth the soil surface as much as possible;
 - c). evenly cover the smoothed area with agricultural lime (if in an area with sandy soil this step may be omitted);
 - d). place approximately 2 tablespoons of peanut butter on a stick or flat rock in the middle of the smoothed area.
3. Assign two groups to each of the three habitat types – forest, edge, and field. Have each group construct a scent station, ensuring that those in the same habitat type are at least 30 yards apart.

Day 4

1. Return the groups to the field site and have them carefully examine the scent stations.
2. Have the students record the number of different types of tracks in their notebooks.
3. Have them use South Carolina's Furbearers and Peterson's Guide to Animal Tracks to identify the tracks and record this data in their notebooks.
4. When each group has finished recording their data, have them re-rake and smooth the scent station plot, add lime (if necessary) and re-bait the site with peanut butter.

Day 5

1. Return the groups to the field site and have them again carefully examine the scent stations.
2. Have each group make a plaster cast of one set of tracks in their scent station. (See handout entitled Tracks.)
3. While the casts are setting ask the students to make inferences, based on the data collected, on habitat preferences of the various wildlife species. Lead a discussion of the importance of edge/ecotone. Ask the question: "What would be the impact of not having such a transitional habitat?"
4. Return the students to the classroom, and when casts have dried sufficiently, have the groups properly label each cast and arrange them in an informational display.

Application

Students will become aware that everything in life is connected in some way. Different animals live in different places. Some species are only found in certain areas while others are free to roam in other areas. Some species are found only in "edge" areas. If the edge is eliminated, that habitat type is gone. This will be especially applicable for the hunters of quail and rabbit. Farmers might even want to consider leaving a space between the forest and their fields to increase the amount of this transitional habitat.

Extension

1. Construct additional scent stations close to a ditch or creek. Compare data.
2. Establish three scent stations in each habitat type, each of the three with a different type of attractant. Compare and contrast the numbers and species of wildlife that visit the various sites.

Resources Available

Teaching Kids About the Environment-Lesson Plans for Teachers- Book II. Kessler, G.D., P.C. Boller, L. J. Boller, Sr., Coalition for Natural Resource Education, 1996.

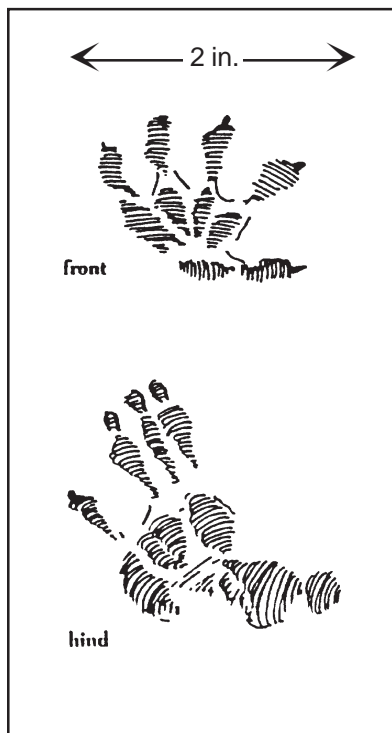
South Carolina's Furbearers. Baker, O. E., III., and Carmichael, D. B., Jr. South Carolina Department of Natural Resources, Division of Wildlife and Freshwater Fisheries, Columbia, SC.

"The Scent Station Technique of Assessing Furbearer Abundance." South Carolina Department of Natural Resources Furbearer Program, Columbia, SC.

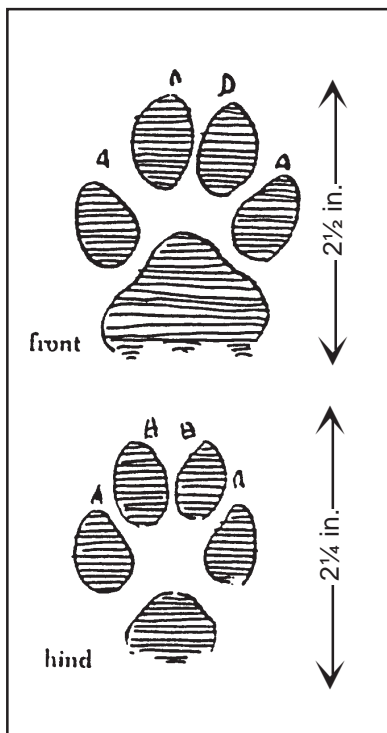
"TRACKS!". Arkansas Game and Fish. deBin, Jerry, Project Wild Coordinator.

Prepared by: Robert Kirby

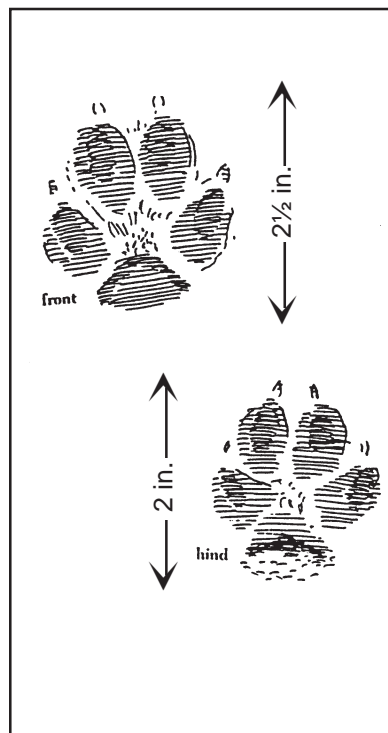
Tracks



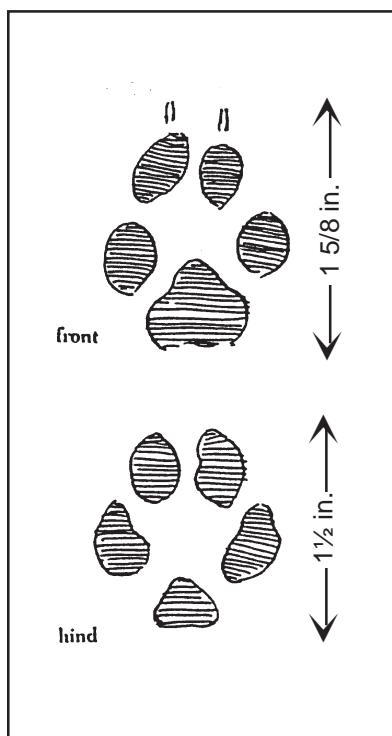
Tracks of opossum



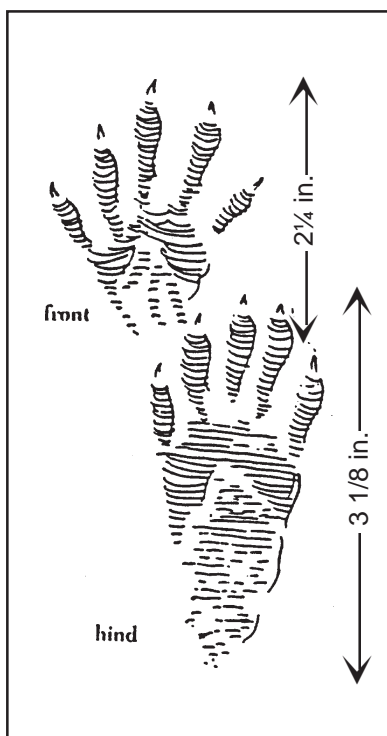
Tracks of coyote



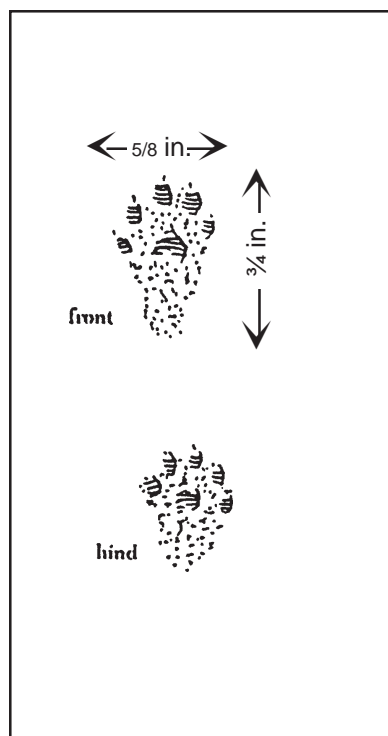
Tracks of red fox



Tracks of gray fox

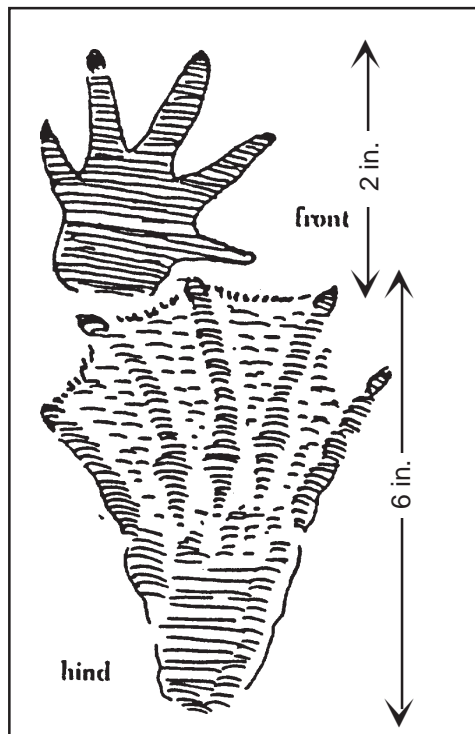


Tracks of raccoon

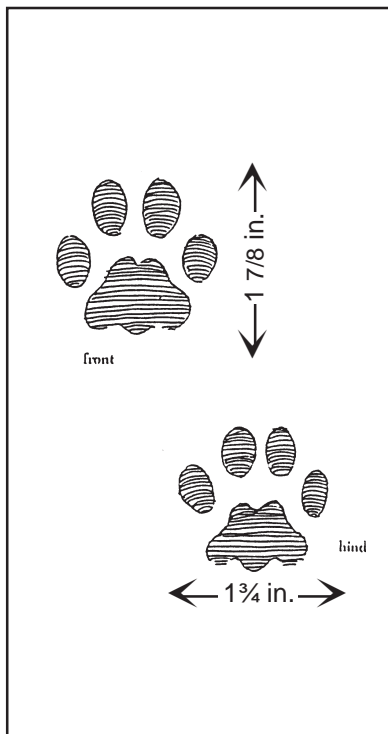


Tracks of long-tailed weasel

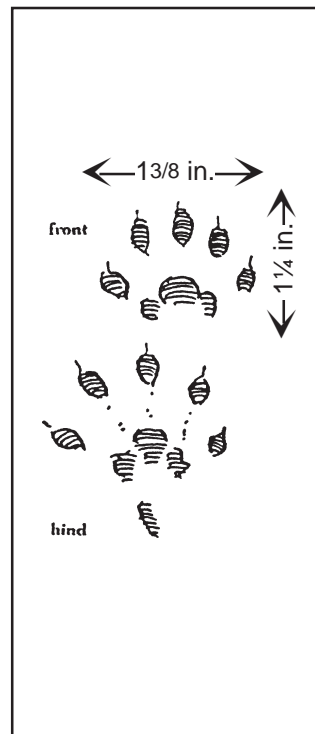
Tracks



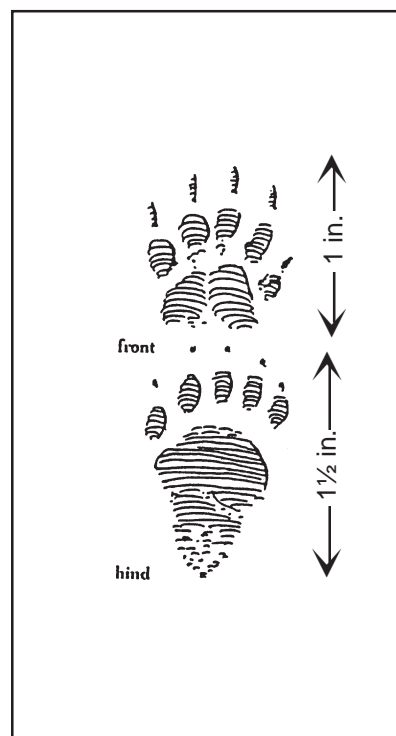
Tracks of beaver



Tracks of bobcat



Tracks of mink



Tracks of striped skunk

WILDLIFE LINES

WILD Activity Page by Jerry deBin, Project WILD Coordinator

TRACKS!

OBJECTIVE:

This Project WILD activity is designed to help you learn to identify common animal tracks.

METHOD:

Begin your own collection by making plaster casts of various animal tracks around your neighborhood, school or farm.

BACKGROUND:

Tracks can be preserved by making plaster casts of them. Once these tracks have been observed or preserved, a lot of information about the animal that made them can be discovered. For example, all mammals have basically the same foot structure. They just use the parts in different ways. If we look at an animal's foot in relation to the human hand, we find that some animals walk on their hands, like the raccoons and bears. Some walk or run on their toes, like

cats and coyotes. Others walk on their "toenails" or hooves like deer and elk. By looking at a track, we can learn much about how that animal lives. We can notice what part of the foot it walks on, whether claws are present, and how many steps are taken in a measured distance.

MATERIALS:

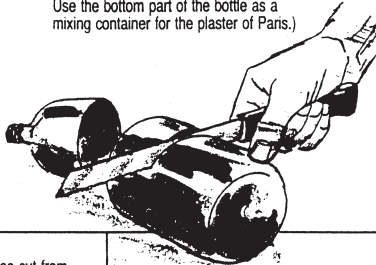
Plaster of Paris, spray shellac (if available), vaseline, sandpaper, felt-tip marker, empty 2-liter plastic bottle (cut top and bottom off).

PROCEDURE:

1. Carefully clean the track of twigs, leaves, and other litter, and then spray the track with shellac.



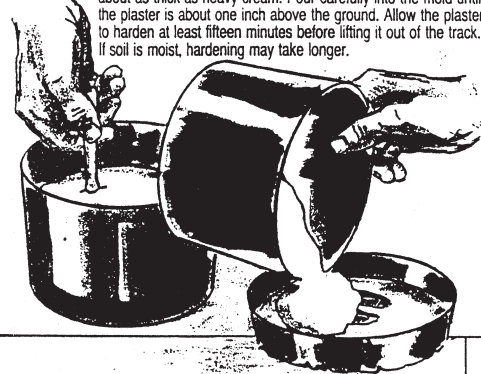
2. Cut the top and bottom out of the plastic bottle as shown in the diagram. (Note: Use the bottom part of the bottle as a mixing container for the plaster of Paris.)



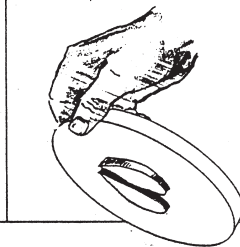
3. Press the circular band firmly into the ground so that the track is surrounded by the plastic.



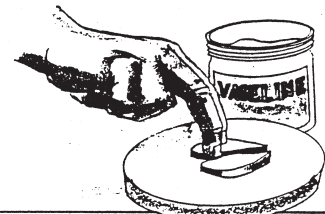
4. Mix about two cups of plaster in the "bowl" (which was cut from the bottom of the plastic bottle), adding water slowly until it is about as thick as heavy cream. Pour carefully into the mold until the plaster is about one inch above the ground. Allow the plaster to harden at least fifteen minutes before lifting it out of the track. If soil is moist, hardening may take longer.



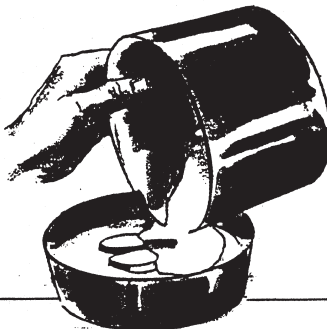
5. Once the cast is hardened, lift it out of the track and remove the plastic mold.



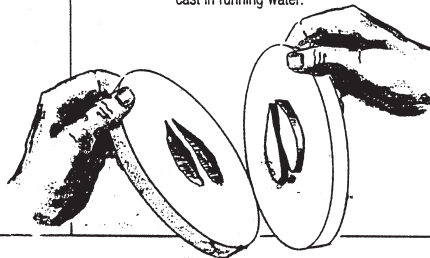
6. Back at home (or in class), wash the cast and scrape any rough places. Rub a thin coating of vaseline on the track and surface of the cast. Place it on a flat surface and place the plastic ring over it as before.



7. Mix the same amount of plaster mold as before and pour into the mold (on top of the hardened cast). Allow two hours for plaster to harden.



8. Carefully remove the plastic mold and separate the two layers of casts. Wipe the vaseline from the cast and track. Use fine sandpaper to smooth any rough places on the casts. Wash the completed cast in running water.



9. Once dried, paint the inside of the track. With the felt-tip pen, write the name of the animal track and your name.



ART BY JIM CLEVELAND