

January Thaw

OBJECTIVES

Students will be able to:

1. Identify & interpret three different animal signs in winter.
2. Construct a narrative that describes comparisons and contrasts between their observations and Leopold's writing in the essay, "January Thaw."
3. Demonstrate their ability to use field guides to identify evidence of animals.
4. Compare and contrast their observations with Leopold's observations in the essay "January Thaw."
5. Construct a map that uses a key to depict a fictional snowy landscape with animal tracks that tells a story.

Key Quote

"Each year, after the mid-winter blizzards, there comes a night of thaw when the tinkle of dripping water is heard in the land. It brings strange stirrings, not only to creatures abed for the night, but to some who have been asleep for the winter."

Sand County Almanac Essay

January Thaw

Time Required

3-4 Class Periods

Educator Note

This activity is best done when there is snow on the ground, or in an area with soft moist soil. It is not absolutely essential to have snow or soft soil, though the tracking will be much more difficult and the teacher may need to "plant" tracks using track replicas (see resources and attached simulation activity).

On a 12-month basis, some animals are more active during certain times of the year (**circannual rhythms**) than at other times of the year. This is especially true of the hibernating mammals. Ground-hogs, 13-lined ground squirrels, bats, and jumping mice hibernate in Kansas. These animals will prepare for hibernation in the fall, lower their metabolism during their hibernation in the winter, and reappear in the spring staying active until the following fall.

Mammal activity during the winter varies from true hibernation (described above) to winter sleep to staying active despite the cold temperatures. Those mammals that winter sleep do not lower their metabolism, but rather "sleep" when the temperatures drop, and actively search for food if the temperatures rise. In Kansas, some winter sleepers include skunks, squirrels, and chipmunks. It should be noted that in Leopold's essay, "January Thaw," Leopold makes mention of "hibernating skunks." At the time of Leopold's writing, it was generally thought that skunks did hibernate. However, we now know that while skunks are nocturnal and less active in winter months, they do not hibernate as previously thought.

Voles, native mice, and native rats, along with larger mammals like coyotes, bobcats, and raccoons, remain active throughout the winter. Evidence of voles are the worn trails through grasslands where the mammals can run under grasses and snow undetected by predators.

BACKGROUND

Winter is not a "dead" season. Animals survive this season through various adaptations that include how and where they move, what they feed upon, how they breathe as well as other adaptations related to biological functions. These behaviors follow cycles with the changing of the seasons. Many of these cycles are dictated by internal biological clocks. Mammals and birds in particular may be active for only part of a 24-hour period (**circadian rhythms**). For example, a chickadee is active during the daylight hours, but will sleep during the night.



Many birds escape the cold temperatures by migrating to southern climates which are warmer. For some species, however, this relocation may be only from northern Kansas to southern Kansas. Interestingly, chickadees, despite their tiny size, do not migrate and are able to remain fairly active during the winter by going into a torpor (temporary hibernation) during cold nights.

In nature, all organisms compete for food, water, shelter, and space. If two different animals require exactly the same food, shelter, and water sources, only one of these species will survive successfully. When house sparrows were accidentally introduced to the U.S., bluebird populations went into decline because house sparrows displaced the bluebirds. Their needs were too similar and our native birds could not compete. Leopold alluded to cases in which some animals are able to coexist by occupying different ecological **niches** (area within habitat occupied by an organism). When similar needs result in “sharing” the resource, both species are able to occupy those niches. For example, hawks are **diurnal** (active by day) while owls are **nocturnal** (active by night), allowing them to exist in the same home range. This is called resource partitioning.

As is often the case with animals, making direct observations of animal behavior can be challenging. Oftentimes, wildlife biologists rely on indirect observations or animal signs to learn about animal behavior. In the winter, much can be learned from studying various animal signs, such as tracks, **browse** evidence (i.e. teeth marks on leaves & twigs), urine stains, feces, and tunnels. Winter is an excellent time to view evidence of mammal activity. Because mammals are secretive, much can be learned about their food habits through observing scat (feces) and their behavior by interpreting mammal signs.

MATERIALS

- ✓ Field guide(s) to animal tracks (see appendix)
- ✓ Map of area to be studied (optional)
- ✓ Containers for collecting materials
- ✓ White paper
- ✓ Markers
- ✓ Plaster of paris (optional)
- ✓ Track molds (see resources)
- ✓ Trays filled with damp sand
- ✓ Field guide(s) to mammals (see appendix)
- ✓ Copy for each pair of students of one of the four “What Happened Here?” scenes

PROCEDURES

Engage (1 Period-Indoors)

1. Ask students if they’ve ever watched any of the crime scene television shows on TV. Ask students to describe how the detectives on the case go about solving the crime. (They collect physical evidence and use these clues to recreate the crime to the best of their ability.)
2. Divide students into teams of two. Distribute a copy of one of the four “What Happened Here?” pages and explain that with their investigative partner, they are going to try to recreate the “crime scene” which in this case is represented by animal tracks. With their partner, they should be prepared to describe what happened here. Allow students to use animal track field guides as necessary.
3. Have the detective teams share their findings with the rest of the class.

Explore (1 Class Period-Outdoors)

1. Have the students read Leopold’s essay, “January Thaw.”
2. Prepare the students to go outside. Distribute one copy of the student pages, a copy of a map of the area the students are investigating and track field guides to each investigative team (see appendix). You may also choose to have the students create their own maps rather than providing one.

Subjects

Language Arts, Science, Geography, Technology, Fine Arts

Vocabulary

Browse
nocturnal
diurnal
niche
circadian rhythm
circannual rhythm

Related Essay

“Home Range”

3. Once outside, inform the students of the boundaries for their investigation and instruct the teams to first try to find a set of animal tracks. Once they have located a set, they should divide and carefully follow the tracks in opposite directions until they have either lost the tracks or reached the boundaries designated by the teacher. They should record their tracks and other landmarks on their maps and respond to the questions on the student page.
4. Have students look for and interpret other evidence of animal activities in the snow, such as tunnels, colored snow (from urine or droppings), wing marks, browsed vegetation, etc. Allow students to collect evidence where and when appropriate. Encourage students to collect evidence in ways that will have the least impact on the habitat. For instance, evidence can be collected through written descriptions in journals, sketches, and diagrams, or by taking photographs. (See resources “Field Study Guidelines” for additional guidelines for evidence collection and working with students in outdoor settings.)

Explain (1 Class Period-Indoors)

1. Debrief the activity by having investigative teams share their findings.
2. Discuss the following questions: What animal(s) do you think you tracked? What do you think the animal(s) was doing? Why do you think this? Did you find any other evidence of animal activities besides tracks?

Elaborate (1+ Class Period-Indoors)

1. Have students create their own “What Happened Here” using at least three different animal tracks. The students should use symbols (similar to those described in the last student page) to represent landmarks and actual representations of animal tracks. Have teams exchange and interpret each others’ “What Happened Here.”
2. Have the students individually write an expository piece that compares/contrasts what they found in their investigations with what Leopold found and wrote about in the essay “January Thaw.”
3. **OPTIONAL:** Have the students create a plaster cast of an animal track by pressing a track replica into a tray filled with damp sand. See resources for procedures.

Evaluate

1. Have the students sketch three different kinds of animal tracks or signs observed in this activity and explain what they show.
2. Use the expository writing exercise above as an evaluation tool.

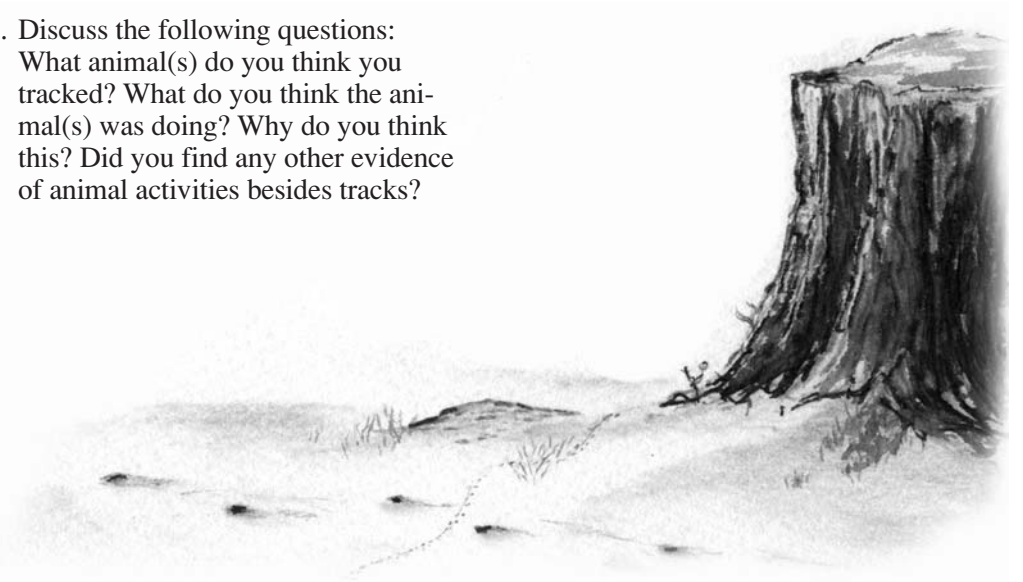
Project Connections

PLT

School Yard Safari
Are Vacant Lots Vacant?

WILD

Tracks
Habittracks
Learning to Look, Looking to See



Extensions

1. Put flour and birdseed on a windowsill to attract birds – observe tracks. Make a track box out of sand and attract wildlife with an open can of sardines – observe tracks.
2. Use cameras to take photos of animal evidence.
3. What evidence did you find? What animals do you think created this evidence? What do you think this might tell you about these animals?
4. Participate in the Winter Birdfeeder Survey (see resources).
5. Have students research and discuss predator/prey relationships for local animals, and how these might affect habitat.

CORRELATIONS TO STATE CORE CURRICULAR STANDARDS

Reading Grades 6, 7, 8, 9-12:

- Standard 1: Benchmark 2, 3, 4
Standard 2: Benchmark 1
Standard 3: Benchmark 1, 3, 4, 5, 6, 7, 8, 9
Standard 4: Benchmark 1

Science Grade 8:

- Standard 1: Benchmark 1, 2
Standard 3: Benchmark 1, 3, 4, 5
Standard 7: Benchmark 1, 2

Science Grades 9-12:

- Standard 1: Benchmark 1, 2
Standard 3: Benchmark 3, 4, 6, 7
Standard 7: Benchmark 2

Social Studies Grades 6-12:

- Standard Geography: Benchmark 1

Environmental Education Grades 6, 7, 8:

- Standard 1: Benchmark 1
Standard 2: Benchmark 1, 2, 3
Standard 4: Benchmark 2

Environmental Education Grades 9-12:

- Standard 2: Benchmark 1, 2, 3
Standard 4: Benchmark 2

RESOURCES

Field Study guidelines for safety and collecting http://happeninhabitats.pwnet.org/working_outdoors/trips_and_tips.php

Create an online field guide for your region. www.enature.com

National Museum of Natural History's North American Mammals website. This is a searchable database of all living mammals of North America and you can also create your own printable field guide from this website. <http://www.mnh.si.edu/mnal/>

Online animal track field guide and ideas/activities for tracking www.bear-tracker.com

Online USGS topographical map maker by city/state or zipcode—if you have GPS, a map can be created from latitude/longitude, <http://www.usgs.gov>

Kansas Department of Wildlife & Parks publications and resources. (Reference center catalog CD is included with this guide, or by contacting KDWP) http://www.kdwp.state.ks.us/news/other_services/education/wildlife_education_services/wildlife_education_materials

New Reference Center Catalog, pages T-4 to T-10

Nature's Notebook (March 2004) pages K-13 – K-16

Track Replicas: Available for loan from the Kansas Department of Wildlife and Parks (also available for purchase through Acorn Naturalists. www.acornnaturalists.com)

Winter Bird Feeder Survey <http://pathfinderscience.net>

Recommended Readings

George, Lindsay Barrett, *In the Snow: Who's Been Here?* ISBN: 0688170560 HarperTrophy, 1999

George, Lindsay Barrett, *In the Woods: Who's Been Here?* ISBN: 0688161634 William Morrow & Company, Inc., 1998

George, Lindsay Barrett, *Around the Pond: Who's Been Here?* ISBN: 0688143768 Greenwillow, 1996

January Thaw

Student Worksheet

Name _____

Date _____ Period _____

INTRODUCTION

This essay reflects the observations made when tracking a skunk during a “January Thaw.”

WHAT TO DO (OUTDOORS)

1. Reread the first two paragraphs about the hibernating skunk.
 - a. Working in pairs, locate a set of tracks and follow them, each member of the pair working in opposite directions.
 - b. What animal did you track?
 - c. Describe your finding.
 - d. Upon regrouping, what did both of you find out about the animal’s activities?
2. Go to an outdoor setting, and search the area for evidence of animal dens, or places where you would “den up” if you were a skunk.
3. Reread the passage about the meadow mouse.
 - a. Search the area, and locate some tunnels through the grass and snow.
 - b. Based on the condition of plants in the area, describe any evidence of mouse or vole activity.
 - c. If you were a meadow mouse, what would you be doing if there were a blanket of snow on the ground?

How would you react to plants and other animals?

- d. How would your reactions be different if there were a January thaw? Explain.
4. Reread the passage about the skunk tracks entering the woods.
 - a. Why do you think the rabbit urine was pinkish?

- b. Can you find evidence of any prey species that were eaten by predators? If so, describe the evidence.
 - c. The owl and hawk are able to exist in the same locale, even though both are birds of prey. Though the hawk and the owl compete for the same prey species, how are they both able to find enough food to survive?
5. Reread the passage about the skunk tracks leading on.
- a. Were you able to find any “dead-end” tracks such as those described in the passage? If so, describe where they ended.
 - b. When you followed the set of tracks, did the animal seem to have a purpose for its wandering? Explain.

WHAT TO DO (INDOORS)

1. Watch the January section of “A Prophet for All Seasons” video.
2. Using mammal slides and field guides, learn the identity of mammals and their tracks common to your state.
3. Using track molds and plaster of paris, make casts of various animal tracks.
4. The white canvasboard can be used to represent a snowy landscape one would encounter in January.
 - ✓ Using the black marker, design various habitat situations using symbols to represent tracks in the snow and habitat features. For example:

>>>> = deer tracks	oooo = grassy open areas
xxxx = rabbit tracks	++++ = shrubs
**** = fox tracks	dddd = deciduous trees
^^^ = coniferous trees	
 - ✓ Using the red marker for blood, indicate where a rabbit was killed by a fox; use green to shade in the conifers.
 - ✓ Glue small twigs together to make “brush piles,” and set up on board.
 - ✓ Use small hollow “twigs” to represent hollow logs.
5. To obtain the most realistic view of each habitat, “walk through the area” by looking through a piece of the plastic pipe, thus limiting the amount of area seen at one time.
6. Discuss the experience and the video as they relate to “January Thaw.”

