

WILDLIFE PRAIRIE STATE PARK

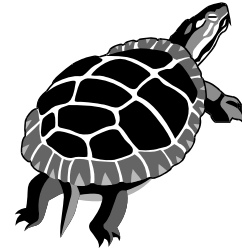
ANIMAL ADAPTATIONS

TEACHER'S PACKET

GRADES: 7-8

Abstract

Survival in nature can be a difficult task. Organisms have developed ways to deal with environmental stresses and habitat changes, called adaptations. Adaptations, if successful, are passed to offspring, and over time, are distributed throughout a population. This program is designed to introduce terms associated with adaptation, give some recognizable examples (i.e. color, body shape, patterns, behaviors), and discuss how adaptations influence change in populations.



Meets State Learning Standards: *The included activities, and the program itself, support the following goals, either completely or in part.*

I. Science

- ✓ 12.A.3c: Compare and contrast how different forms and structures reflect different functions (e.g. similarities and differences among animals that fly, walk or swim; structures of plant cells and animal cells)
- ✓ 12.B.3b: Compare and assess features of organisms for their adaptive, competitive, and survival potential (e.g. appendages, reproductive rates, camouflage, defensive structures)
- ✓ 13.B.3d: Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g. diamond, coal, gold mining; deforestation)

II. Language Arts

- ✓ 4.A.3a: Demonstrate ways (e.g. ask probing questions, provide feedback to a speaker, summarize and paraphrase complex spoken messages) that listening attentively can improve comprehension.

III. Mathematics

- ✓ 6.B.3b: Apply prime factors, divisors, multiples, common factors and common multiples in solving problems.

Objectives:

Students will be able to:

- ✓ Describe a plant's adaptations to its environment, and the advantages and disadvantages, if any, to that adaptation.
- ✓ Compare similarities and differences in animals, and identify examples of animals with protective adaptations, hunting adaptations, adaptations to habitat, and others.
- ✓ Recognize that all organisms must be well suited (adapted) to their habitat in order to survive there.

The goal of all educational programs at Wildlife Prairie State Park is to help students become environmentally knowledgeable, skilled, dedicated citizens who are willing to work, individually and collectively, toward achieving and maintaining a balance between the quality of life and the quality of the environment.

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
ACTIVITY OUTLINE**

- I. Pre-Trip Activities:** Suggested activities to conduct before your field trip
- A. Adapt and Survive: An activity that lets students make decisions for a coyote pup, as he tries to make his way to adulthood safely. Includes an answer key.
 - B. Thorns and Threats – An activity designed to help students recognize defense adaptations, their advantages and/or disadvantages.
 - C. I'm Thirsty - An activity that uses mathematical calculation to determine the answer to such questions as, "How many miles to the gallon does a mountain goat get?" and "How much water do a mountain goat and his family drink in one year?"
- II. Post-Trip Activities:** Suggested activities to conduct after your field trip
- A. Fact and Fancy - A writing activity that allows students to create an explanation of how an animal adaptation came to be (i.e. Why the opossum has a naked tail).
 - B. Who fits Here? - An activity that requires students to apply what they have learned about adaptations and habitats, and create an ecosystem quiz for other classmates.
 - C. Little Green Monsters - An activity that reinforces the students' ability to recognize adaptations. Uses both imaginary and real examples.
- III. Other Suggested Activities:**
- A. Seeking Shelter - An activity that evaluates different urban components for usefulness to animals, as compared to rural components.
 - B. Write an Evaluation - An activity that fulfills Language Arts requirement #4.A.3a. Encourages students to write to the Naturalist who gave their program, and critique their presentation. Also provides an opportunity to have additional questions answered.

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
PRE-TRIP ACTIVITY**

ADAPT AND SURVIVE

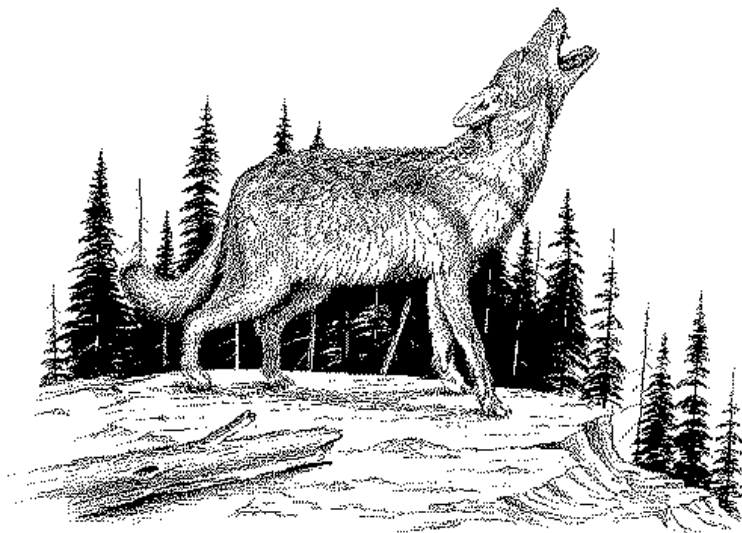
OBJECTIVE: This activity will help students understand that change, both natural and human-made, is a normal part of an animal's existence, and that adapting is necessary for survival.

PROCEDURE: Play a game of choices to discover if you are as adaptable as the coyote, and determine if you can adapt to survive in a changing world?

1. Make copies of the "Discussion" and "Coyote's Choice: Adapt and Survive."
2. Have the students read the discussion, then the story, making choices along the way, as they would if they were a coyote.

(NOTE: This activity can also be set up as a fun series of stations which the initial situation is described and illustrated and the students must choose one course or another by turning over a card or lifting up a flap to reveal the consequences of their decision. Then they can move on to the next station to test their wits there.)

EXTENSION: When visiting Wildlife Prairie State Park, Keep a journal of the mammals and their special adaptations (ex. Owls have soft wings for silent flight).



ANIMAL ADAPTATIONS

ADAPT AND SURVIVE: DISCUSSION

Adapted from Keepers of the Animals, Michael J. Caudato and Joseph Bruchac

COYOTES: Coyotes are adaptable hunters of both daytime and nighttime. They will hunt in packs or alone and feed on live prey, carrion, wild fruit, and nuts, or city trash. Coyotes thrive in the wilderness and have been known to capture poodles in the streets of Los Angeles. They can den up in a drainage pipe, a cave, a hollow log, or in a large fox burrow. Perhaps it is the coyote's remarkable adaptability that has inspired its role as a trickster who takes many forms in Native American Stories.

There are up to nineteen subspecies of coyote in North America, which is the only continent to which they are native. The coyote has the most extensive range of any carnivore in the Western Hemisphere, stretching from the Arctic Circle to northern South America and from the Atlantic to the Pacific Oceans.

Affectionate, sociable and cooperative, coyotes mate for life and remain together as a pair year-round. When the six to eight pups disperse in the fall or late summer, one young remains behind with the parents to help raise next year's litter in the spring, in case something should happen to one of the parents before the young are old enough to fend for themselves.

Although coyotes do kill sheep, it is abnormal behavior carried out by renegade animals. Most coyotes living near farms actually help to drive away potential threats to livestock. Their normal food consists of woodchucks, rabbits, mice, and voles, fruit, corn, dead animals, and, occasionally, a stray pet.

Coyotes began to emigrate from western North America to New York State, other northeastern states and the eastern provinces of Canada in the 1930's. Since that time they have saturated their habitat and are now spreading down river valleys to the Mid-Atlantic States and further south. They did not fill the old niche of the wolf, which was systematically killed off in these regions, since the wolf required a different habitat of extensive forested land and prey of large game animals. Coyotes in the East are larger than those out West because food is plentiful and habitats are more favorable. Some biologists also suspect that eastern coyotes may be larger because they have bred with gray wolves, which can weigh from 70 to 120 pounds. New Mexican coyotes average 24.4 pounds, while Vermont's average 39.1 pounds.

Far from being vicious animals that attack people in packs, as is erroneously rumored, coyotes will often roll over belly-up when captured.

Perhaps only human beings are as capable of change, of adapting our behavior, food sources and habits, as our close neighbor the coyote. But we have responded to the coyote and to both the gray and red wolf, by declaring war on them – shooting, trapping, snaring, hunting, gassing, and poisoning these wild dogs not to mention leveling, paving, flooding, and developing their habitat. The gray wolf has been extirpated from much of its former range and the red wolf is now on the verge of extinction.

Many people have come to the coyote's defense, but the battle still continues between those who want to kill off or drive out coyotes and animals that they perceive as competing with people, and those that struggle to help others to appreciate and enjoy coyotes, foxes, groundhogs, mice, and other mammals that share our habitat.

Now, answer the questions on the following pages, making choices you think the coyote pup would make to see if you could survive.

ANIMAL ADAPTATIONS ADAPT AND SURVIVE: COYOTE'S CHOICE

Use the following questions to make choices for the coyote. Check your answers to see if you survive to adulthood.

1. You are a tiny coyote pup and your mother has gone off to hunt for food. While you wait in the burrow a strange piece of thin wire on the end of a stick is pushing toward you from the door of your den. You see it coming and are afraid of it so you....
 - a. Cover back against the wall of the burrow to escape.
 - b. Attack the wire by biting it.

2. You are old enough to do some hunting on your own. Up ahead, you see a dead animal that looks like it is more than enough for a whole meal. When you get closer you see some strange tracks in the soil and smell an animal you have never smelled before. You are **VERY** hungry, but afraid to go closer to the dead animal. After watching a while and looking for signs of danger you decide to....
 - a. Eat the meat of the animal.
 - b. Turn away and search for another meal.

3. It has not rained for a long time, and the plants are dying and animals are becoming scarce. You are very weak, yet you feel an urge to travel to look for food. You begin to walk away from your burrow but you find it hard to walk. You decide to....
 - a. Push ahead to look for water and food elsewhere, even though it might mean using the last of your energy.
 - b. Return to the burrow and wait for the rain and food to return.

4. You come to a place where people are living because you know there is usually some food nearby. There is a place up ahead where the smell of food is strong, yet danger very near and threatening. As night slowly advances with the setting sun, you decide to....
 - a. Sneak in and eat as much of the food as you can under the cover of darkness.
 - b. Turn around and seek food elsewhere.

5. With your strength restored, you travel a short distance seeking shelter – a place to sleep and digest your meals. There is a strange burrow above ground up ahead. It is large and the morning sun reflects off the strange, smooth skin into your eyes. You climb up into it and try walking through the place that looks like the entrance, but you bump into something you cannot see. Finally you find an opening in on the side and walk in, only to find many strange smells meet your nostrils. You sniff a few times, and suddenly feel very tired. You decided to
 - a. Lie down and sleep here.
 - b. Move on to look for a safer place.

6. When you wake up the sun is setting, and you are hungry again, but not starving like before. You leave your burrow and walk until you come to the edge of the woods. You see a field with some furry animals eating plants, but you are not sure it is safe to enter the fields, or if these animals are food or not. As you move closer you notice a freshly killed rabbit in front of you. There are those strange looking tracks around it, like the ones you saw near that dead animal with the strange smell some time ago. But this meat smells good as you approach it and your hunger deepens. Then, as you move even closer, you notice something sticking out of the ground near the rabbit. It looks like it has large teeth and is made of the same strange shiny skin of the burrow. You look around one more time to make sure that none of the dangerous animals who walk on two feet are around, then you....
 - a. Pounce on the rabbit.
 - b. Run off into the underbrush, sensing danger.

If you have successfully survived by making all of the right choices, you will now raise a new coyote family. On the way back to your burrow you meet a coyote and decide to take him/her as your mate. Soon the next generation of coyotes is born and you have pups of your own to feed. They will face many of the same dangers as you did as a pup, and will have to work hard to adapt and survive.

ANIMAL ADAPTATIONS
ADAPT AND SURVIVE: COYOTE'S CHOICE
Teacher Answer Key

1. If you chose (a) you survived.
If you chose (b) you were snared and taken away by a hunter.

2. If you chose (a) the meat was a poisoned trap set by a farmer and you're a goner.
If you chose (b) you survived.

3. If you chose (a) you survived.
If you chose (b) starvation set in and you became too weak to leave your burrow. You did not survive.

4. If you chose (a) you were able to eat safely while protected by the darkness. You survived.
If you chose (b) your last strength was used when searching for food in another spot. You did not survive.

5. If you chose (a) You slept in an old abandoned car and made it your temporary shelter. You survived.
If you chose (b) you found a large hollow tree to rest in and slept safely all day.

6. If you chose (a) you felt a sharp, cold pain climb up your leg from one of your feet. Your foot is in a steel trap and there is no way out. You did not survive.
If you chose (b) you survived.

Evaluation: How did you do? Did you think there was danger when there really wasn't? Did you think someplace was safe, and it turned out to be a trap?

Adapted from Keepers of the Animals, Michael J. Caudato and Joseph Bruchac

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
PRE-TRIP ACTIVITY**

THORNS AND THREATS -- CONCENTRATION

OBJECTIVE: A memory game to reinforce student's awareness of common defense mechanisms used by both plants and animals

PROCEDURE: Discuss "Thorns and Threats". Divide the students into a Plant team and an Animal Team. Alternating between the two teams, a member from each team will go up to the Concentration Board, which has the following pictures or descriptive words:

Plants

Nettles
Blackberries
Milkweed
Poison Ivy
Nuts
Cherry Twig
Mullein Leaf

Defenses

Sting
Prickle
Taste Bad
Itch
Hard Coat
Smells Bad
Fuzzy

Animals

Bee
Porcupine
Toad
Mosquito
Turtle
Skunk
Woolly Bear Caterpillar

Note: Different animals and plants may be used to illustrate the defenses. Scramble plants and animals so that they are not beside their corresponding defense.

This game is set up by making each plant, animal, and defense into a card (index size is fine). Attach these cards to a poster or blackboard. Each student should try to match the plant or animal with its appropriate defense. If the correct match is made, the flap is removed from the plant or animal name, but not from the defenses. Discuss how some plants and animals use more than one defense.

MATERIALS: A *Concentration Board* with flaps to cover pictures or words (could use a chalk board with construction paper flaps to cover the pictures/words)

ANIMAL ADAPTATIONS

THORNS AND THREATS: DISCUSSION

Adapted from [Hands on Nature](#), Jenepher Lingelback

Many plants and animals have developed surprisingly similar defenses. One of the most familiar defensive weapons found on both plants and animals is projection(s) that might scratch or puncture. Thorns and prickles protect plants from being eaten and are especially prevalent on plants that grow in open and/or dry areas where grazing animals might otherwise threaten their survival. Animals, also, have rather formidable projections. Horns usually grow only on the male, like deer and elk, and are used in courtship rituals. And finally, there are quills. These modified hairs, which so effectively protect the slow-moving porcupine, are covered with hundreds of very small, diamond-shaped overlapping scales. The quills of the North American porcupines also have barbed tips at the end. When threatened, the porcupine erects these “hairs” with special muscles and either waits for the predator to attack, or turns its back to the attacker and swats with its tail. The loosely attached quills release easily, but the porcupine cannot throw its quills. New quills begin to grow within a few days to replace the lost ones.



Another, often deadly, defensive weapon used by plants and animals alike is poison. When people think of poisonous plants, the first that come to mind are often mushrooms. Although most mushrooms are *not* poisonous, enough are to warrant caution. There are other plants that are also toxic, especially to grazing animals. It is important to learn the ones that grow in your area. Poison as a defensive weapon can also be found, though less frequently, among animals. Snakes are probably the most feared. Like mushrooms, most snakes are not poisonous, but one should learn to recognize those that are. Spiders are also feared because of the way they paralyze their prey with venom from glands opening into fang-like appendages near the mouth. Spider venom used defensively against larger animals can cause pain or itching, but rarely death.

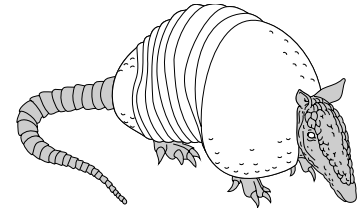


The third defense, used to plants and animals advantage, is offending the senses. Some plants have developed very proficient “don’t touch” adaptations. Stinging Nettles are a good example. The hair-tips covering the stems and leaves of the nettle break off easily when touched and release a skin irritant. A swelling, stinging rash follows almost immediately. Poison ivy causes an itching rash and browsers rarely eat Mullein, with its fuzzy leaves. Pungent odors and strong tastes of certain plants work to defend not only these particular plants but also even those surrounding them. No predator, except perhaps a great horned owl, which has a very poor sense of smell, is likely to risk the odor of a skunk more than once. An insect with a powerful defense is the stinkbug, which secretes an odor that really exemplifies its name.

Bad taste, or at least very unpleasant mouth sensations are inflicted by a number of creatures. American toads can secrete a substance that is very irritating to mucous membranes. Dogs, for instance, froth at the mouth after picking up a toad. Monarch butterflies retain the bitter taste of milkweed from their larval stages, which renders them inedible to birds and other predators. Experiments in Massachusetts showed that a blue jay would actually vomit after eating only two and one half monarch butterflies.

Body posture, the pretenses of looking fierce or dead so that a predator will give up, can also be very effective. An opossum drops as if it is dead to fool predators that prefer live prey. Owls look fierce as they ruffle their feathers and hunch their wings in a dorsal threat display. A threatened cat assumes a similar posture, back arched and hairs erect, which make it look much larger than its actual size.

Tough outer covering can further prevent successful attack. Most woody plants, especially trees, are protected by hard bark, which until age, disease, or accident make penetration possible, thwarts most invaders. Animals, too, have evolved a variety of protective coats or shelters: armadillos, turtles, and snails for example. Fish scales are both tough and slippery. One characteristic shared by all arthropods (insects, spider, crabs, lobsters, and so on), is their hard exoskeleton, which serves both as support and protection.



Finally, there is a rather remarkable defense used by both plants and animals: a “take it, I don’t need it” adaptation. Plant lovers who have taken cuttings from favorite plants know the regenerative powers of many plants. In the animal kingdom there are many examples of expendable body parts. Spiders can replace a lost leg with a new smaller leg at the next molting. Crayfish and crabs can grow new claws; lizards can grow a new tail. Ground feeding birds can relax the muscle of each tail feather, so those grabbed by a predator simply fall out. In time new ones grow back.

Despite the great variety of effective defenses used by plants and animals, some predators continue to circumvent or overcome these defenses, thus maintaining a balance in the natural world.



Adapted from [Hands on Nature](#), Jenepher Lingelback

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
PRE-TRIP ACTIVITY**

I'M THIRSTY

OBJECTIVE: Students will make inferences about the importance of adaptations in order for wildlife and other animals to survive.

PROCEDURE:

1. Provide students with this background information about desert bighorn sheep:

I'M THIRSTY

Animals make what sometimes seem to be incredible adaptations in order to survive in their environments. Use the following hypothetical example of the desert bighorn sheep: The desert bighorn live in dry, sparsely vegetated areas of the Southwest. Temperatures on summer days are frequently over 100^o F. During the hottest months of summer, ewes (females) and lambs come to waterholes almost daily. The male sheep, however, called "rams", sometimes do not come to water for nearly a week at a time. These rams may range 20 miles away from the waterhole, and then travel the 20 miles back again for another drink. Add to this the approximate number of 5 miles traveled per day during the week away from water--and you arrive at a figure of almost 75 miles between drinks! The rams are believed to drink approximately four gallons when they do come to water, while an ewe drinks approximately one gallon, and a lamb drinks two pints.

2. Given the background information, ask the students to carry out these calculations:

- a) How many miles to the gallon does a ram get?
- b) How many gallons of water would a ram drink in a month?
- c) How many gallons of water would an ewe drink in a month?
- d) How many gallons of water would a lamb drink in a month?
- e) How much water must be available in a waterhole for 10 rams, 16 ewes, and 7 lambs in order for them to survive the months of June, July, and August?
- f) What rate in inflow would a waterfall have to have to sustain the population given above if water evaporated at a rate of 10 gallons per day?

Answer Key for Teachers

- a) $75 \text{ miles/week} \div 4 \text{ gallons/week} = 18.75 \text{ miles/gallon}$
- b) $52 \text{ weeks/year} \div 12 \text{ months/year} = 4.33 \text{ weeks/month}$
 $4 \text{ gallons/week} \times 4.33 \text{ weeks/month} = 17.32 \text{ gallons/month}$
- c) $1 \text{ gallon/day} \times 7 \text{ days/week} = 7 \text{ gallons/week}$
 $7 \text{ gallons/week} \times 4.33 \text{ weeks/month} = 30.31 \text{ gallons/month}$
- d) $2 \text{ pints/day} \times 7 \text{ days/week} = 14 \text{ pints/week}$
Convert to gallons; 8 pints = 1 gallon
 $14 \text{ pints/week} \div 8 \text{ pints/gallon} = 1.75 \text{ gallons/week}$
 $1.75 \text{ gallons/week} \times 4.33 \text{ weeks/month} = 7.58 \text{ gallons/month}$
- e) June =30days, July =31 days, August =31 days, 92 days total. This assumes there is no evaporation and no rainfall--both of which are poor assumptions.
Rams: $4 \text{ gallons/week} \div 7 \text{ days/week} = .57 \text{ gallons/day}$
 $.57 \text{ gallons/day} \times 92 \text{ days} \times 10 \text{ rams} = 524 \text{ gallons of water for rams}$
Ewes: $1 \text{ gallon/day} \times 92 \text{ days} \times 16 \text{ ewes} = 1472 \text{ gallons for ewes}$
Lambs: First convert daily water consumption into gallons.
8pints=1 gallon.
 $2 \text{ pints/day} \div 8 \text{ pints/gallon} = .25 \text{ gallons/day}$
 $.25 \text{ gallons/day} \times 92 \text{ days} \times 7 \text{ lambs} = 161 \text{ gallons of water for lambs.}$
Total gallons for herd: $524 + 1472 + 161 = 2157 \text{ gallons}$
- f) $2157 \text{ gallons of water} \div 92 \text{ days} = 23.45 \text{ gallons/day for herd}$
 $23.45 \text{ gallons/day} + 10 \text{ gallons to make up for evaporation} = 33.45 \text{ gallons/day rate of inflow from waterfall.}$

- 2. Predict various complications that could develop if there were only one-half of the amount of water calculated as being needed in step e.
- 4. Discuss the importance of adaptations to wildlife and other animals, based on the example of the bighorn sheep in the southwestern United States. NOTE: This activity can be used effectively as an extension or review for other activities about adaptation.

EXTENSIONS:

- 1. Study topographical maps of typical desert bighorn sheep habitat. Predict the animals' food requirements based on available vegetation. Research caloric value of available foods. Estimate the animals' caloric intake per day, per week, per year.
- 2. Find out what the available seasonal water supply is in a desert bighorn sheep habitat area. Predict the seasonal maximum carrying capacity of the site based on water supply.
- 3. Adapt this activity for a social studies class. Compare daily bighorn sheep water usage to human daily water usage. Use as a point from which to discuss the importance of water conservation--to people, domesticated animals, wildlife, industry, natural resources, the planetary environment, etc.

From [Project Wild](#), with permission from the Council for Environmental Education

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
POST-TRIP ACTIVITY**

FACT AND FANCY

OBJECTIVES: Compare mammal adaptations for finding food and escaping from enemies. Write and illustrate a fanciful story that describes how a mammal adaptation came to be.

MATERIALS: reference books, paper and pencils, crayons or markers.

PROCEDURE: Begin by discussing some of the ways mammals and other animals are adapted to survive. Explain that adaptations are characteristics or behaviors that help an animal survive in its environment. For example, ask the students to think about some of the ways a fish is adapted to life in the water. (Gills, fins, and a streamlined body are some examples). Ask them if they can think of other animal adaptations.

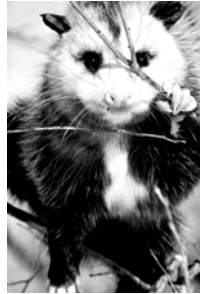
Next, pass out copies of the descriptions and tell the students that each mammal pictured has special adaptations that help it survive. Read the description of the opossum and then the story, "Why Possum Has A Naked Tail". Have students write and illustrate stories based on an animal adaptation. Explain that they can either choose an animal from the description sheets or they can research an animal of their choice. Their stories should combine fact with fiction, explaining what the adaptation is really used for. After they've finished, let them share their stories and pictures with the rest of the group.

ANIMAL ADAPTATIONS

FACT AND FANCY: ANIMAL DESCRIPTIONS

Adapted with permission from National Wildlife Federation's Amazing Mammals-PartII, *NatureScope*.

Virginia Opossum - A house cat-sized, grayish white to black mammal with a long pink tail that has black at the base. North America's only marsupial, the opossum is active at night in trees or on the ground. It searches for fruit, nuts, insects, and small animals. When cornered it will fake death, lie limp, and cause predators to lose interest.



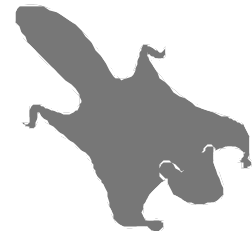
Eastern Cottontail- Widespread east of the Rocky Mountains in heavy brush, woods, and fields. This cottontail rabbit is grayish brown with rusty nape and white tops on its feet. It can damage gardens, shrubs, and small trees.



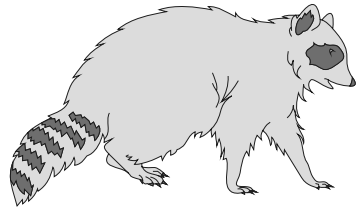
Beaver- our largest rodent – adults can weight up to 60 pounds. A Beaver can topple small trees with its huge teeth. This large rodent feeds on bark and twigs. It builds stick and mud dams and lodges on ponds and streams in its home territory. It swims well, using its webbed hind feet. Beavers warn each other of danger by slapping the water with their scaly, paddle-shaped tail.



Northern Flying Squirrel- This flying squirrel lives in forests and sometimes attics in the northern U.S. and Canada. It is slightly larger than the Southern Flying Squirrel, and the white fur on its under-parts is dark at the base. The flying squirrel uses the skin flaps attached to each side of its body for gliding from tree to tree.



Raccoon- The well-known, masked “bandit” that raids garbage cans. The Raccoon lives in woods and by streams, and is now moving into cities. Its coat is brownish gray and the tail has rings of black and yellowish white. It searches mostly by night for fruits, nuts, insects, frogs, and fish.



Striped Skunk- Occurs in the contiguous 48 states and southern Canada. This common skunk is primarily active at night. Its presence can be noted in the woods, prairies, and suburbs. It has a white nape and two broad white stripes on each side.



Bobcat- a southern cousin of the Lynx, often called the “wildcat.” Found widely from Canada to Mexico in wild country, it is now absent from much of the Midwest. Its coat is warm reddish brown in summer and much grayer in winter, with many small dark spots (particularly on the legs). Known for its wild screams, the Bobcats hunts birds and mammals at night in woods, swamps, and rocky country.



White-tailed Deer- Glimpses of this deer’s “white flag” tail bounding into a forest, or a doe with its white-spotted fawn, are highlights of any day’s outing. This deer is the most important game mammal in the East. It is widespread in woods, swamps, and brush over much of the U.S. and southern Canada. It sometimes becomes too common due to its freedom from predation by wolves and cougars. White-tailed Deer eat twigs, grasses, fungi, apples, and acorn. They are excellent swimmers and have adapted well to the suburbs. Unfortunately, vehicles often strike them. Active day or night, they can run up to 35 mph, jump 8 feet high, and leap 30 feet in one bound.

Adapted with permission from National Wildlife Federation's Amazing Mammals-PartII, *NatureScope*.

ANIMAL ADAPTATIONS FACT AND FANCY

Why Possum Has A Naked Tail (Cherokee – Southeast)

From Keepers of the Animals, Michael J. Caudato and Joseph Bruchac.

In the old days, Possum had the most beautiful tail of all the animals. It was covered with long silky hair and Possum liked nothing better than to wave it around when the Animal People met together in council. He would hold up his tail and show it to the Animal People.

"You see my tail," he would say, "Is it not the most beautiful tail you have ever seen? Surely it is finer than any other animal's!"

He was so proud of his tail that the other animals became tired of hearing him brag about it. Finally, Rabbit decided to do something about it. Rabbit was the messenger for the animals and he was the one who always told them when there was to be a council meeting. He went to Possum's house.

"My friend," Rabbit said, "there is going to be a great meeting. Our chief, Bear, wants you to sit next to him in council. He wants you to be the first one to speak because you have such a beautiful tail."

Possum was flattered. "It is true," he said, "one who has such a beautiful and perfect tail as I have should be the first one to speak in council." He held up his tail, combing it with his long fingers. "Is not my tail the most wonderful thing you have ever seen?"

Rabbit looked close at Possum's tail.

"My friend," Rabbit said, "it seems to me as if your tail is just a little dirty. I think that it would look even better if you would allow me to clean it. I have some special medicine that will make your tail look just the way it should look."

Possum looked close at his tail. It did seem as if it was a little bit dirty.

"Yes," Possum said, "that is a good idea. I want all of the animals to admire my tail when I speak in council."

Then Rabbit mixed up his medicine. It was very strong, so strong that it loosened all of the hair on Possum's tail. But as he put the medicine on Possum's tail he wrapped the tail in the skin that had been shed by a snake.

"This snakeskin will make sure the medicine works well," Rabbit said. "Do not take it off until you speak in council tomorrow. Then the people will all see your tail just as it should be seen."

Possum did as Rabbit said. He kept the snakeskin wrapped tightly around his tail all through the night.

The next day, when the animals met for council, Possum sat next to Chief Bear. As soon as the meeting began, he stood up to speak. As he spoke, he walked back and forth, swinging his tail, which was wrapped in snakeskin. He smiled as he thought of how good his tail would look because of the medicine Rabbit put on it. All of the animals were watching him very closely, looking at his tail. Possum grinned at the thought of how beautiful his tail would look. The time was right.

"My friends," Possum said, holding up his tail and beginning to unwrap the snakeskin, "I have been chosen to start this council because of my tail. It is the finest of all the tails. Look at my beautiful tail!"

Possum pulled off the snakeskin wrapping and as he did so, all of the hair fell off his tail. His tail was naked and ugly and when Possum saw it, the grin froze on his face. All the animals were looking at him. Possum was so ashamed, that he fell down on the ground and pretended to be dead. He did not move until long after all the other animals had gone.

To this day, Possum still has that foolish grin on his face and whenever he feels threatened, he pretends that he is dead. And, because he was so vain, Possum has the ugliest tail of all the animals.

From: Keepers of the Animals, Michael J. Caudato and Joseph Bruchac.

WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
POST-TRIP ACTIVITY

WHO FITS HERE?

OBJECTIVES: To identify characteristic life forms in ecosystems and generalize that each ecosystem has characteristic life forms, adapted to live there.

MATERIALS: Poster board for ten posters, crayons, paints, or magazine photos for posters (National Wildlife or Audubon magazines are great to use for pictures); index cards or construction paper for 50 adaptation cards.

PROCEDURE: Students make and play an identification game using posters and cards.

1. Divide the class into two equal groups. Explain that each group will make a game for the other. The object of the game will be to match animals to the environment in which they live.
2. Ask each half of the class to choose five ecosystems they would like to know more about; e.g. desert, hardwood forest, prairie, marsh, alpine. Divide each half of the class into the five groups, one per ecosystem. Have each group research their ecosystem, learning its characteristic life forms including adaptations of the animals in that environment.
3. Ask each student group to make a poster showing the characteristic vegetation, terrain, etc., in the ecosystem they are studying. Posters of each ecosystem can be made with crayons and paints or magazine cutouts.
4. For each ecosystem, students should make five cards, one for each of the five species of animals in the ecosystem. Put a description of the animal's adaptation to its environment on one side of the card, and a coding number on the other side, so that the animal described can be identified later. Do not write the name of the animal on the card. The cards should describe adaptation that enables the animals to survive in the ecosystem. For example, desert environment cards may read:

"Hunts at night for warm rodents and sleeping birds; can climb loose, sloping sand by throwing loops of its body up like coils" (sidewinder rattlesnake)

"Relies on agility and speed to escape predator; needs little water; gets water from plants it eats." (Cottontail rabbit)

"Hunts at night; lives in burrows of animals like gophers." (Burrowing owl)

"A bird which hibernates in winter to avoid desert cold." (nightjar)

"Larvae feed on yucca flowers." (yucca moth)

5. When posters are made and cards are completed, students in each half of the class should make a master list of the five ecosystems and animals their cards represents. Next they shuffle all their five ecosystems together into one pile.
6. Each half of the class then exchanges posters and cards with the other half.
7. Each half of the class then tries as a group to decide to which ecosystem each card belongs.
8. Next give each half of the class the master list for their posters. One student per group can read off the animals that correspond with each card for each poster.

QUESTIONS: Has each animal been placed in its proper ecosystem? If not, why? Were there any animals found in more than one ecosystem? Are these ecosystems varied? How can some animals live in more than one ecosystem, and not others? What are similarities and differences among the ecosystems and characteristic life forms? What are some of the most interesting animal adaptations? What functions do these adaptations serve? How do they relate to the nature of the physical environment? Ask the students what characterizes animals and the environments in which they live. (Each environment has characteristic life forms. These animals and plants are adapted to live where they do.)

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
POST-TRIP ACTIVITY**

LITTLE GREEN MONSTERS

OBJECTIVE: Name several freshwater wetland plants and describe how they are adapted to their habitats.

BACKGROUND: Some of these plants devour insects, others can soak up to 25 times their weight in water, and one can produce enough heat to melt snow. It may sound like science fiction, but certain wetland plants can really do these things. In this activity to your students will be separating imaginary wetland “monsters” from real plants that are just as unique.

PROCEDURE: As you briefly discuss each plant (using the following pages), the students must decide if the plant is real or not. The information we’ve provided includes brief descriptions of each plant. For the quiz, read only the information that is in *italic*. (Don’t read the name of the plants.) You can add the additional information later when you discuss the plants that are real. Tell the students to concentrate on the explanations you read to decide if the plants are real or not. After the kids have finished, discuss their answers and tell them which plants are real. Also show them pictures of the real “monsters” as you discuss them.

EXTENSION: After discussion of real vs. imaginary plants, have students “invent” their own plant. Prepare a report on where it grows, how it obtains nutrients, and any special feature to the class. Have students present them to the class.

ANIMAL ADAPTATIONS LITTLE GREEN MONSTERS

PLANT INFORMATION

1. **(Venus Flytrap – Real):** *This plant has sensitive trigger hairs on the inside of each leaf. If an insect brushes against at least two hairs, the leaf will close up, trapping the insect. Then the plant gradually digests the insect's soft parts, leaving the exoskeleton.*

This carnivorous plant grows in the marshes of North and South Carolina.

Today, Venus flytraps are rare because many people have dug up the plant to take home or sell in plant shops. *Note:* In the discussion you may want to point out to the students that, like all other carnivorous plants, Venus flytraps can grow without digesting insects or other small creatures (they can make food through photosynthesis, or are autotrophic). Insects and the like provide supplemental nutrition for the plant in the wetland environment in which they grow, as there is not always ample nutrition in the soil.

2. **(Three-leaved Stick'em Plant - Imaginary):** *This small plant has a special way of getting its seeds around. Its seeds stick onto the fur of passing animals. The plant sprouts while still on the animal, and grows there for a short time, relying on stored food in its seed coat. When it is ready to take root, the plant drops off, and finds a home in the soil.*
3. **(Hooded Pitcher Plant - Real):** *Each of this plant's leaves form a special "pitcher", and deposits nectar on the lip to attract insects. The surface around the lip is very slippery, and as the insects crawl or land near the lip, many may fall into the pool of digestive fluid that fills the bottom of the pitcher. Downward-pointing hairs and the slippery walls of the pitcher prevent insects from crawling out to freedom.*

Hooded pitcher plants have another trick that is unique among pitcher plants.

They have transparent "windows" in the back of their hoods that resemble escape routes. When insects attempt to fly through, they crash into the window, and fall into the pitcher. These plants grow in marshes, bogs, and other wetlands from North Carolina to Florida.

4. **(Shoveler Plant - Imaginary):** *This wetland plant has a special adaptation that helps it survive in overcrowded areas. As it breaks through the soil, two large, thick leaves grow on either side of the main shoot. These leaves grow outward and uproot any other plants that are in the way.*
5. **(Round-Leaved Sundew - real):** *The leaves of this plant are covered with many short stalks. Each stalk is tipped with sticky nectar. Insects attracted to the nectar land on the stalks and become stuck. As they struggle to escape, they come in contact with more stalks, and become firmly trapped. The stalks slowly move the insect toward the center of the leaf, then the edges of the leaf slowly fold around the insect, and digestion begins.*

The sundew gets its name from the way sunlight glistens on the liquid-tipped hairs. Much like the Venus Flytrap and Hooded Pitcher Plant, the sundew digests only the soft parts, and disposes of the exoskeleton.

6. **(Sphagnum Moss - real):** *This plant often grows in open water or on the surface of moist soil. Gas-filled cells keep it floating near the water's surface. The cells are specifically designed to soak up water, and each plant can absorb as much as 25 its own body weight in water! The plant stores this extra water for times of drought.*

Sphagnum moss is often the first plant to grow in a bog. Younger plants grow on top of older plants. As the older layers die, they eventually form thick deposits of peat. In the past, people have used peat to heat their homes, stop wounds from bleeding, and make super-absorbent baby diapers. Today, people use it mostly to condition the soil in their gardens.

7. **(Horned Bladderwort - real):** *This water-dwelling plant eats small aquatic insects and other animals. Its leaves and stalks are lined with many small, balloon-like bladders that each has a trapdoor. As insects pass by, they are "sucked" through the trapdoor, and slowly digested.*

Bladderworts grow in the shallow waters of marshes, bogs, and swamps.

8. **(Tentacle Plant - Imaginary):** *This plant has long, sticky tentacles that grow out in all directions from its base. If an insect, or some small creature, touches the tentacle, it temporarily stunned. The tentacle slowly curls around the victim, squeezing it tightly. Nutrients are then absorbed through the tentacles, and distributed to the rest of the plant.*

9. **(Skunk Cabbage - Real):** *This plant begins growing very early in the spring each year, sometimes when snow is still on the ground. As the plant pushes through the soil, it produces heat by breaking down the food reserves stored in its roots. The plant may get so warm that it melts the snow surrounding it! This heat helps protect its delicate flower.*

Scientists aren't sure why Skunk Cabbage starts growing so early each year.

But they think it must give the plant some advantage over the other plants growing in the area. Skunk cabbage has another unusual adaptation; it gives off a skunk-like odor that attracts flies and other insects, which help pollinate the plant.

EXTENSION: As a follow-up, try raising some carnivorous plants in your classroom. They can be purchased through: Carolina Biological Supply Company, 2700 York Rd, Burlington, NC 27215.

Adapted with permission from National Wildlife Federation. Activities adapted from the Wading into Wetlands issue of NatureScope.

**WILDLIFE PRAIRIE STATE PARK
ANIMAL ADAPTATIONS
PRE OR POST-TRIP SUPPLEMENTAL ACTIVITY**

SEEKING SHELTER

ACTIVITY: Match up some forms of shelter for animals in the city to their counterpart shelters in other areas.

GOAL: Understand how animals have adapted to urban environments by finding shelters that meet their needs in the city.

PROCEDURE: Make copies of "Seeking Shelter" worksheet. Discuss the many ways that animals must meet their basic needs for food, shelter, water, and space in the city. Ask the students to give some examples of specific city animals and how they meet their needs. Ask them to describe how populations of that animal, which live in rural areas, meet their needs.

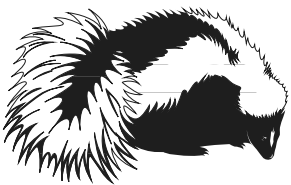
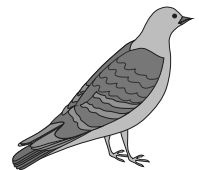
Pass out copies of "Seeking Shelter" and have the students draw lines to connect the rural forms of animal shelter on the left with their counterparts in the city. Each form of shelter on the left may correlate with more than one on the right, and vice versa.

EXTENSION: As a follow-up to the matching exercise, take a field trip to look at urban wildlife and some of its inhabitants.

ANIMAL ADAPTATIONS SEEKING SHELTER

Animal Requirements

1. What does an animal need to live close to people in a city, town, or suburb?
2. How does a specific animal, such as the American Robin, meet its specific needs for food, shelter, water, and space in the city?
3. What are some animals you can think of that live in cities or towns? Where did those animals come from?
4. Are city animals as important to the web of life on Earth as animals that live in less populated areas?
5. Which are your favorite city animals? Which are your least favorite? Why?
6. What are some of the threats/dangers animals face in the city? In the country?
7. How could you help take care of animals in the city or suburbs?



**ANIMAL ADAPTATIONS
SEEKING SHELTER
MATCHING**

*Match the Rural Animal Shelters on the left with the corresponding
Urban Animal Shelter*

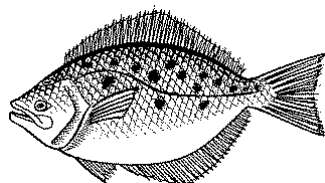


Rural Animal Shelter

- Dense shrub
- Hollow tree
- Underground cave
- Under a rock
- Hollow log
- Crack in the tree bark
- Tree branches
- Among tree roots
- Gravelly riverbed
- Crotch of a tree
- Bed of pine needles
- On top of the ground
- Underside of leaves
- Field grasses
- Stone wall
- Pond or marsh
- On a flower

Urban Animal Shelter

- Gravel rooftop
- Chimney
- Mattress
- A flower in a flower bed
- Space under a porch
- Duck pond in a park
- Basement
- Insulation in attic or walls
- Stone wall
- Bushes in a garden
- Crack in a cement wall
- Soil in vacant lot
- In a drain pipe
- Under a loose brick
- Top of telephone pole
- Weeds in a vacant lot
- Crack in the sidewalk



**ANIMAL ADAPTATIONS
SEEKING SHELTER
MATCHING**

Match the Rural Animal Shelters on the left with the corresponding Urban Animal Shelter



Rural Animal Shelter

Urban Animal Shelter

- | | |
|------------------------|------------------------------|
| Dense shrub | Gravel rooftop |
| Hollow tree | Chimney |
| Underground cave | Mattress |
| Under a rock | A flower in a flower bed |
| Hollow log | Space under a porch |
| Crack in the tree bark | Duck pond in a park |
| Tree branches | Basement |
| Among tree roots | Insulation in attic or walls |
| Gravelly riverbed | Stone wall |
| Crotch of a tree | Bushes in a garden |
| Bed of pine needles | Crack in a cement wall |
| On top of the ground | Soil in vacant lot |
| Underside of leaves | In a drain pipe |
| Field grasses | Under a loose brick |
| Stone wall | Top of telephone pole |
| Pond or marsh | Weeds in a vacant lot |
| On a flower | Crack in the sidewalk |

