

HAVE FUN! EXPLORE! COLLECT A PATCH!

Look at all these things you can do. Pick something and do it!

- Search up in the sky (page 3).
- Make a swallow (page 5).
- Search for extreme eaters (page 7).
- Collect soil samples (page 8).
- Find nocturnal insects (pages 10-11).
- Navigate like a moth (page 12).
- Watch while you wait (page 13).
- Search on the edge of day and night (page 15).
- Search on the edge of roads (page 16).
- See invisible underwater animals (page 18).
- Search for a sinistral snail (page 19).
- Search for EAOPs (page 24).
- Test mosquito-avoidance tactics (page 25).
- Find extreme survivors (page 26).



BORROW AN EXPLORER PACK!
Ask park staff for a pack filled with exploring tools and books.

TO EARN A PATCH:

- Complete 7 to 14 of the explorations listed above.
- Attend a nature program or take a nature hike.
- Watch for milfoil (p. 20), check your green score (pp. 22-23), or save the natives (p. 27).
- Fill out the evaluation form with a grown-up (found on colored insert of this booklet).

TO RECEIVE YOUR PATCH (CHOOSE ONE METHOD):

- Give your evaluation to a park staff person and tell him/her what you did.
- Visit the Wisconsin Explorers website. Go to <www.wiparks.net> and search for Wisconsin Explorers. Complete and submit the evaluation form following the directions on the website. The patch will arrive by mail in 2-4 weeks.
- Mail the evaluation form, your name and address, and a letter or journal entry telling about your explorations to: Wisconsin Explorers PR/6, Department of Natural Resources, P.O. Box 7921, Madison, WI 53707. The patch will arrive by mail in 2-4 weeks.

**FOR MORE INFORMATION, CALL (715) 365-8966
OR EMAIL DNRWISCONSINPARKS@WISCONSIN.GOV**

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UP IN THE SKY

To find out what lives way up there, you're going to have to do some exploring. Try these ideas. Use words or pictures to describe what you find.

LOOK AT NIGHT

Shine a bright flashlight up into the sky. What do you see?

CHECK OUT CARS

Windshields and grills collect a lot of things that fly. Can you identify any of the remains?

SEARCH NEAR WATER

Many small insects and the flying things that eat them zoom over water. Look for an aerial food chain in action.

HIKE IN THE WOODS

Find a shaft of light in the woods. Do you see insects, dust, or pollen floating in the sunlight?

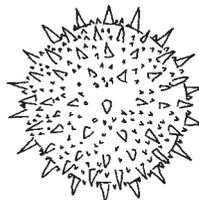
THINK ABOUT IT

Here are some things to think about when you can't sleep!

A lot of animals live up there in the air above us. Where do they go to the bathroom?

Many spiders eat their old webs to recycle the silk. If pollen, spores, and other tiny things get stuck in the sticky part of the web, does the spider know it's getting extra nutrition?

Imagine you are sitting outdoors at a ballgame or picnic. Suddenly there is a little insect or spider crawling on you. You look up. There is nothing above you. How did it get there?



magnified pollen

FIELD NOTES

Aeroplankton

In an ocean filled with water, you would expect to find extremely small plants and animals (plankton) floating in the water. In an ocean of air, you can expect the same thing. Tiny lifeforms that live in the air are called aeroplankton. Aeroplankton includes micro-insects and spiders, bacteria, pollen, spores, viruses, mold, algae, and wind-scattered seeds.



wind-blown aphid

INVENT AN AIRBORNE CRITTER

Animals that spend most of their time in the air have special features and behaviors that help them survive. Think about these aerial adaptations.

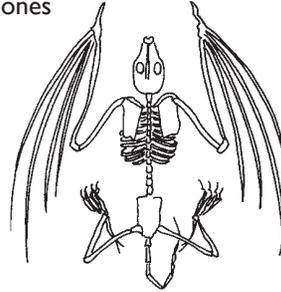


silken "wings"

Young spiders release enough silk from their spinnerets to lift and carry them to new places.

skin wings

Bats' "finger" bones are really long. Skin stretched between the bones makes flight possible.

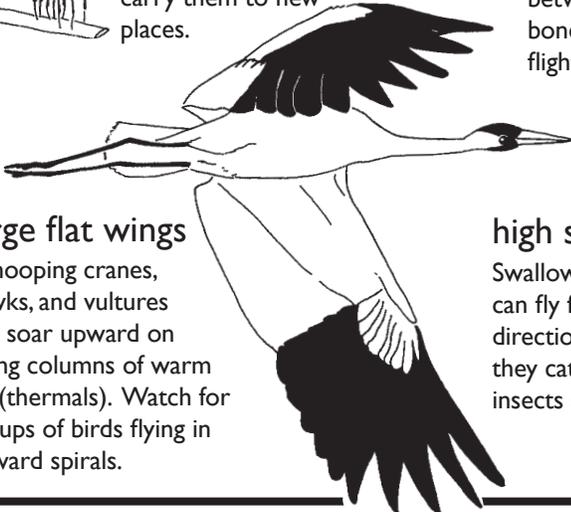


super wings

Unlike most insects' wings, dragonflies' wings move independently from each other. This allows dragonflies to fly forward, backward, up, and down. They can also hover and make sharp turns.

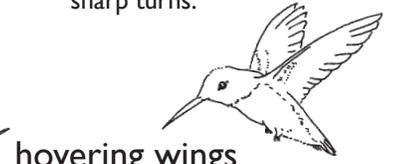
large flat wings

Whooping cranes, hawks, and vultures can soar upward on rising columns of warm air (thermals). Watch for groups of birds flying in upward spirals.



high speed wings

Swallows and nighthawks can fly fast and change directions quickly as they catch and eat flying insects on the wing.



hovering wings

Hummingbirds can use their small wings and flexible shoulders to hover over flowers while they sip nectar.

DRAW YOUR CRITTER

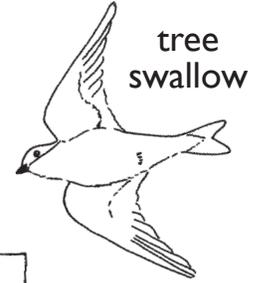
If you could invent an airborne creature, what kind of animal would you make? A bird, a mammal, an insect, or something else? How big is it? Does it fly or glide? What does it eat? Does it have any predators? Draw a picture of the new animal and tell about its special adaptations.

MAKE A SWALLOW

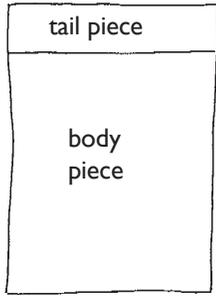
Birds have perfected flight. People are still learning. Make this bird from a regular-sized piece of paper (8 1/2" X 11") and watch it soar!



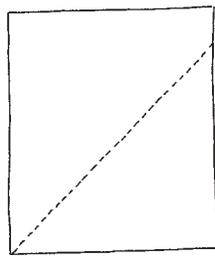
cliff swallow



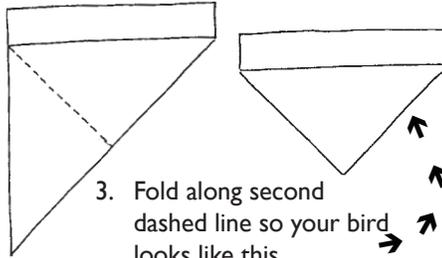
tree swallow



1. Cut or tear off about 1 1/2" to make tail.

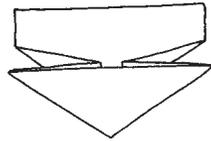
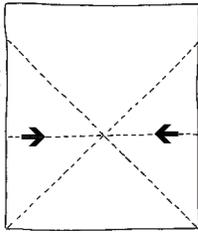


2. Fold body along dashed line.

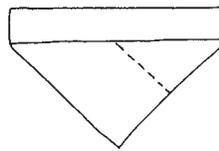


3. Fold along second dashed line so your bird looks like this.

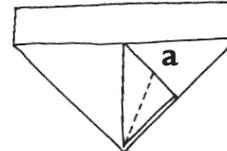
4. Open flat and fold back along horizontal dashed line. Unfold.



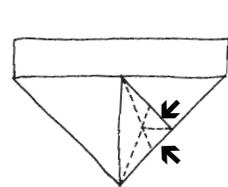
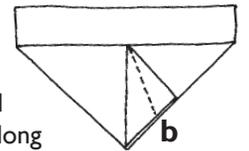
5. Fold sides (see arrows at step 4) to collapse the two triangles on top of each other.



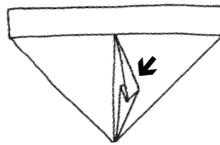
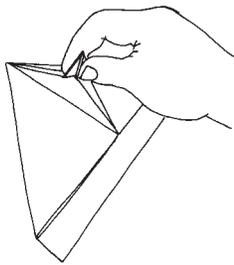
6. Follow these steps for right side. Fold top point down along dashed line.



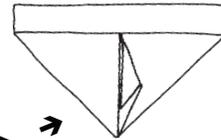
7. Fold and unfold along dashed lines (a and b).



8. Pinch at arrows—folding along dashed line—to form a peak.



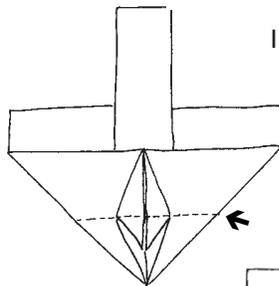
9. Fold peak down so the right side of your bird looks like this.



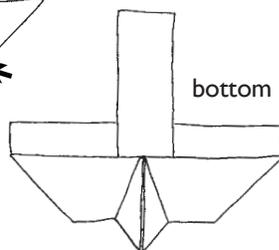
10. Repeat steps 6 through 9 with the left side.



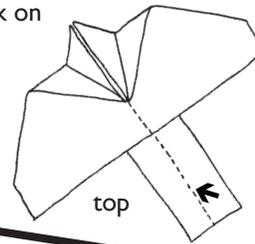
11. To make tail, fold corners to make point.



12. Insert point of tail into swallow's nose. Fold lower part back on dashed line to make head.

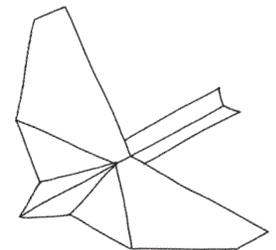


bottom



top

13. Fold bird and tail in half on dashed line.



FLY YOUR SWALLOW

Angle the wings as shown in step 13. Hold the swallow by the nose. Throw it straight up as hard as you can and watch it circle downwards. After you make the basic design, start experimenting. Try different shapes of wings and tails. Try curling the wings. Which combinations fly best?

FIND OUT MORE

Check out *The Secrets of Animal Flight* by Nic Bishop.

I explored the sky by ...

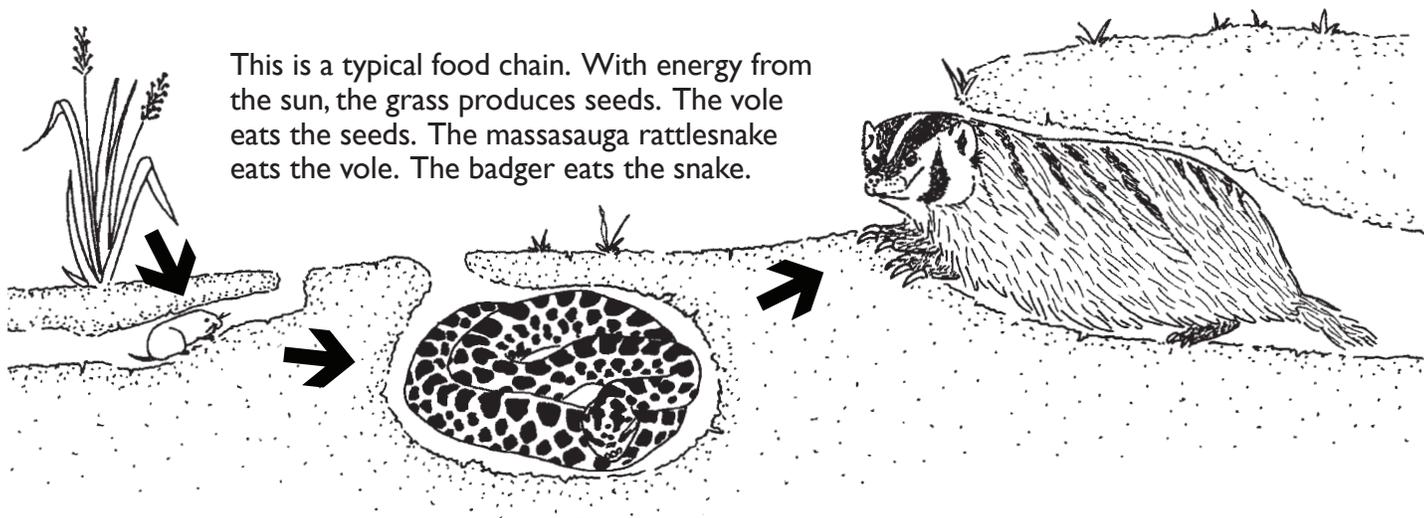
- Looking up at night.
- Checking out car grills.
- Searching near water.
- Hiking in the woods.
- Inventing an airborne critter.
- Making a swallow.

UNDER YOUR FEET

There are some amazingly disgusting things that happen under the ground (and right on top of the ground) that you might not want to know about. If so, stop here and skip to page 8.

FINISH THE FOOD CHAIN

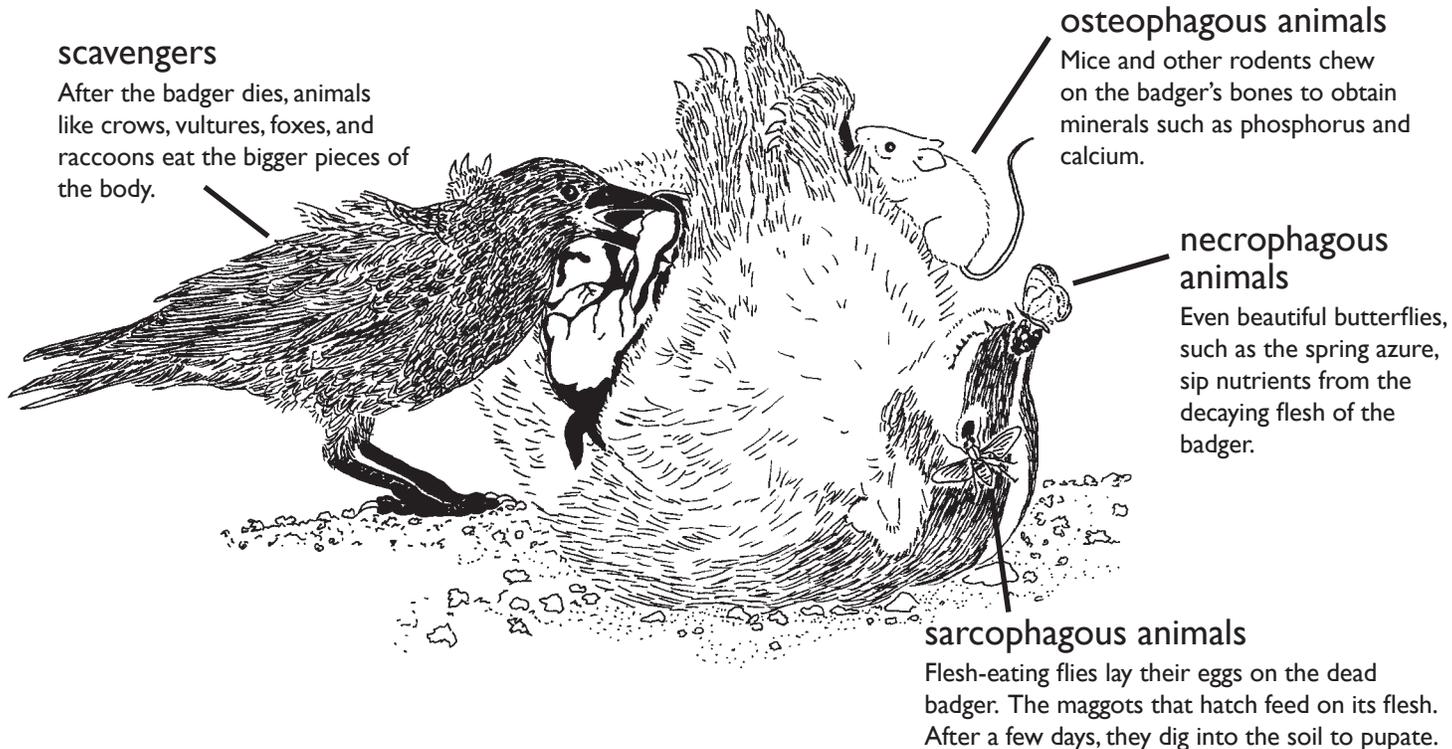
Some people get a little uncomfortable when talking about carnivores and predators, but that isn't the really gross part of the food chain. It's the things they don't talk about in school that can turn a stomach.



This is a typical food chain. With energy from the sun, the grass produces seeds. The vole eats the seeds. The massasauga rattlesnake eats the vole. The badger eats the snake.

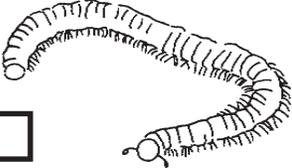
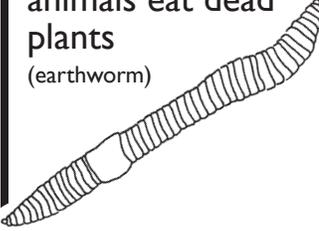
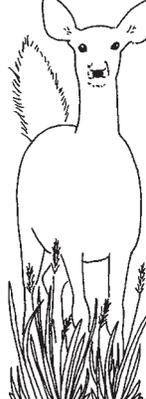
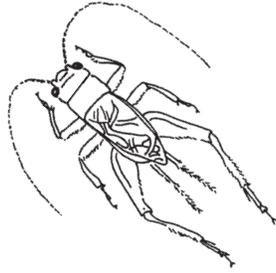
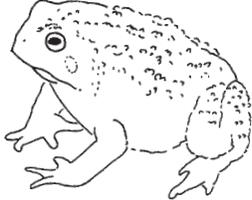
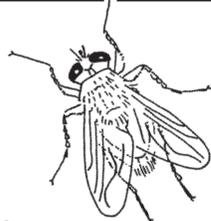
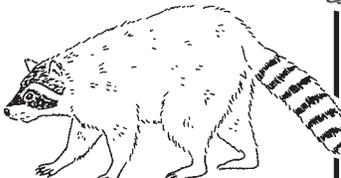
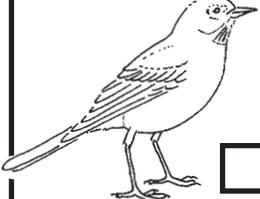
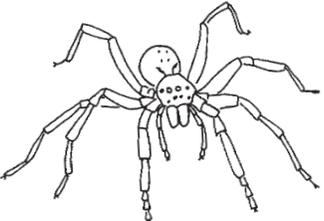
DISCOVER THE REST OF THE STORY

The food chain doesn't really get interesting until the badger dies. If it weren't for scavengers (animals that feed on dead stuff), the earth would soon be covered with piles of dead plants and animals. When the scavengers are done, the decomposers (bacteria, fungi, millipedes, beetles, and worms) slowly turn dead things back into basic nutrients that plants can use to grow.



SEARCH FOR EXTREME EATERS

Forget about herbivores, carnivores, and omnivores! Go in search of the animals on this page that eat bizarre things. Most of these extreme eaters can be found right under your feet. Check them off as you find them. Can you find four in a row, four in a column, all four corners, or all of them? (Hint: vore=one that eats, phagous=feeding or eating on, tropho=nourishment)

<input type="checkbox"/> hematophagous animals suck blood (mosquito, leech, tick)  (hee-muh-TOF-uh-gus)	<input type="checkbox"/> detritivores eat decomposing material (millipede, slug, snail, crayfish, pill bug)  (dih-TRI-tih-vors)	<input type="checkbox"/> mycetophagous animals eat fungus (slug, fungus beetle, millipede)  (my-see-TOF-uh-gus)	<input type="checkbox"/> coprophagous animals eat droppings (dung beetle, rabbit)  (kuh-PROF-uh-gus)
<input type="checkbox"/> necrophytophagous animals eat dead plants (earthworm)  (neh-KRO-fy-TOF-uh-gus)	<input type="checkbox"/> geophagous animals eat mineral earth (deer, earthworm)  (jee-OFF-uh-gus)	<input type="checkbox"/> necrophagous animals eat decaying flesh (yellow jacket, vulture, burying beetle)  (neh-KROF-uh-gus)	<input type="checkbox"/> cannibals eat their own kind (cricket, mouse) 
<input type="checkbox"/> self-cannibals eat parts of their own bodies, such as shed skins (toad, caterpillar) 	<input type="checkbox"/> kleptoparasites steal food from other animals (spider, eagle)  (klep-tuh-PAIR-uh-sights)	<input type="checkbox"/> trophallactic animals eat regurgitated food (honeybee, ant, some birds)  (trof-uh-LAK-tick)	<input type="checkbox"/> osteophagous animals eat bones (mouse, squirrel)  (OS-tee-OFF-uh-gus)
<input type="checkbox"/> sarcophagous animals eat flesh (blow fly)  (sahr-KOF-uh-gus)	<input type="checkbox"/> pantophagous animals eat almost anything! (raccoon, opossum, skunk)  (pan-TOF-uh-gus)	<input type="checkbox"/> scolecophagous animals eat worms (robin, toad, gartersnake)  (skol-ih-KOF-uh-gus)	<input type="checkbox"/> insectivores eat insects (spider, shrew, swallow, frog, dragonfly) 

COLLECT SOIL SAMPLES

Soil is made of broken-down rocks, water, air, bacteria, and decayed plants and animals. Soil comes in many different colors. Collect some samples by rubbing soil in the spaces on this page. Try soil from woods, fields, and wetlands.

FIELD NOTES

Soil colors

Brown soil has a combination of iron and dead plants and animals.

Black soil contains a lot of dead plants and animals.

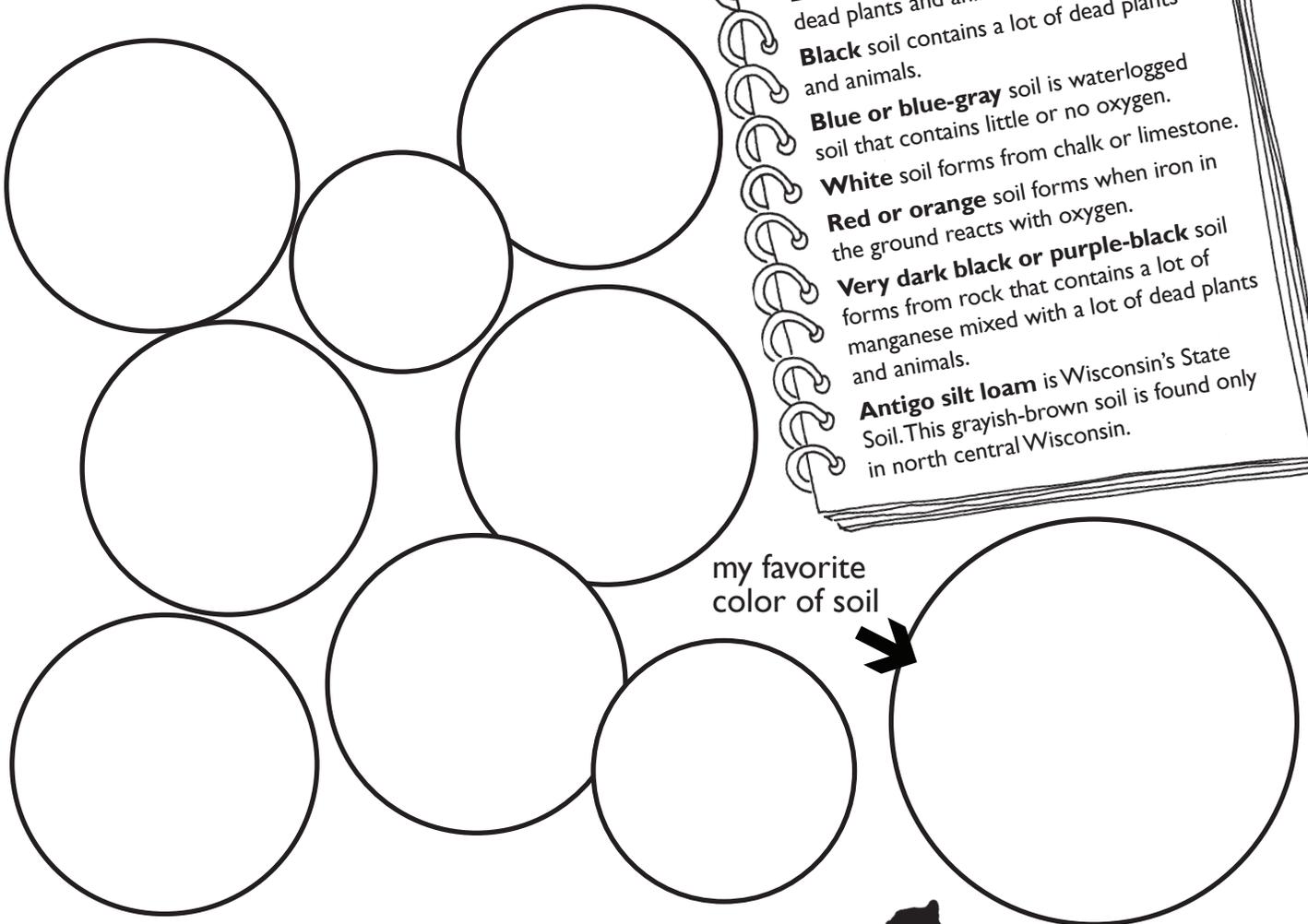
Blue or blue-gray soil is waterlogged soil that contains little or no oxygen.

White soil forms from chalk or limestone.

Red or orange soil forms when iron in the ground reacts with oxygen.

Very dark black or purple-black soil forms from rock that contains a lot of manganese mixed with a lot of dead plants and animals.

Antigo silt loam is Wisconsin's State Soil. This grayish-brown soil is found only in north central Wisconsin.

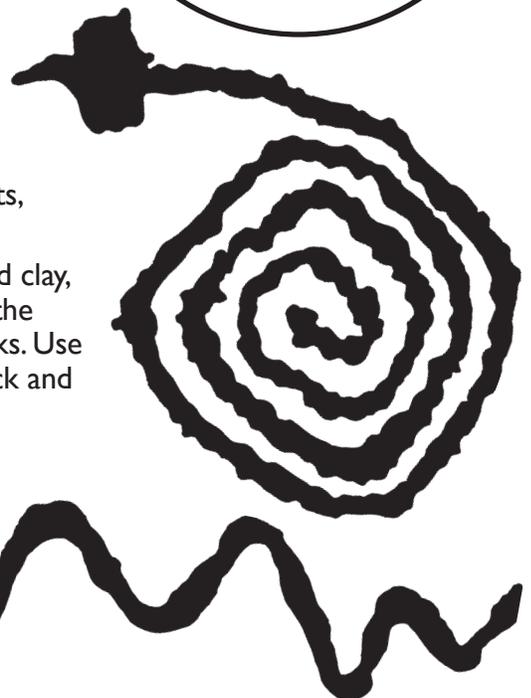


my favorite color of soil

PAINT WITH EARTH COLORS

The earliest painters used powdered clay, crushed rock, soil, and charcoal mixed with animal fat or spit. They painted in caves, on rocks, and on their bodies. We still use earth materials to make paints, ceramics, and cosmetics.

You can experiment with earth colors, too. Find some soft rock, dried clay, or colorful soil. Crush it with a hard rock. Add some cooking oil to the powder. These paints don't work on paper, but you can paint on rocks. Use your fingers or a brush. To make a paintbrush, take a pencil-sized stick and pound it with a hammer or pointed rock until the end is tattered.



snake rock art from around the world

LIVE LIKE A BADGER?

Wisconsin is nicknamed “the Badger State” because of the lead miners who lived here in the 1800s. The miners dug tunnels into hillsides searching for lead. The tunnels were warm and cozy, so the miners lived underground—like badgers.

Badgers are short, stocky, solitary animals with incredibly long, thick claws. They hide inside their shallow dens during the day. At night, they hunt for small grassland animals such as pocket gophers, ground squirrels, rabbits, and birds.

Badgers are tough fighters, snarling and growling at intruders. They can also give off a skunk-like scent when disturbed.

Are you like a badger? If so, how? If you aren't like a badger, which animal do you think you are most like and why?



FIND OUT MORE

Visit EEK! to learn more about the American badger and other Wisconsin state symbols.
<<http://dnr.wi.gov/eeek/critter/mammal/badger.htm>>

- I explored under my feet by ...
- Searching for extreme eaters. I liked the _____.
- Collecting soil samples.
- Painting with earth colors.
- Comparing myself to a badger.

Exploring the Extremes . . .

DURING THE NIGHT

On almost any warm night of the year, you can find insects flying around. That is, you can find them if you know where to look or if you invite them.

FIND NOCTURNAL INSECTS

GO TO THE LIGHTS

Visit bright lights after dark.

SHAKE KEYS

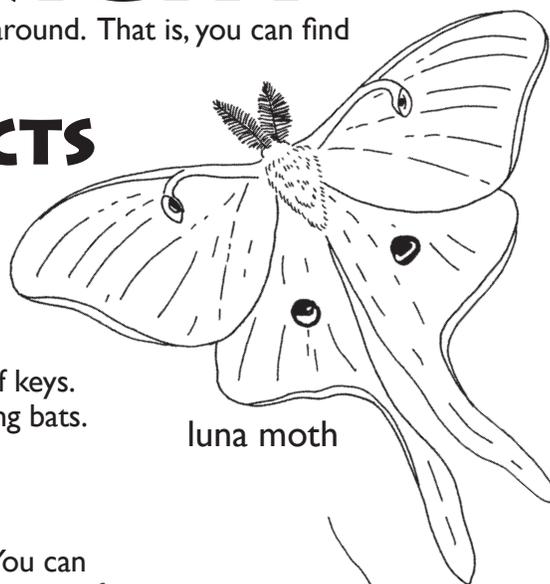
If you see moths flying around, try this trick. Gently shake a ring of keys. If you do it just right, the keys sound like the clicks made by hunting bats. The moths will drop from the sky or fly away fast in all directions.

PUT UP A SHEET

On a cloudy night, rig up a white bed sheet so it hangs vertically. You can use rope, clothesline, or wire on the top. Use rocks to hold the bottom of the sheet tight. Put a bright flashlight on the ground and prop it up so it is pointing at the sheet. Turn off all other lights. Insects will be drawn to the bright light. On your next camping trip, experiment with different colored lights (yellow, red, black, or candlelight) to see which attracts the most insects.

FIX A SNACK

You can attract moths by mixing together some moth goop. Smash together some overripe fruit (banana, peach, berries), a little sugar, and a little fruit juice. The mixture should be as thick as pancake batter. Spread the goop on several tree trunks that are on the edge of the woods. Visit the trees after dark and early the next morning.



luna moth



virgin tiger moth

Take a close look at its underwings.

FIELD NOTES

Night-blooming flowers
It should come as no surprise that wildflowers that bloom at night are pollinated by night-flying insects. Since it is dark out there, the night-blooming plants have to go to extremes to attract moths. They usually have white, green, or yellow flowers that reflect moonlight. The flowers have very strong, sweet perfumes that can be smelled from far away.

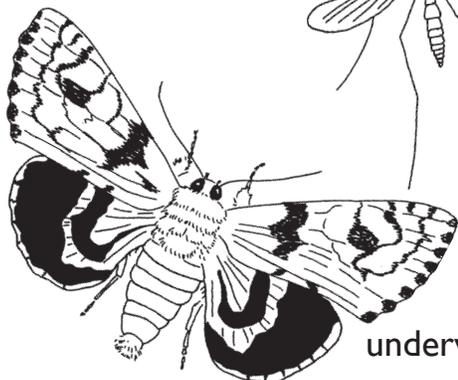
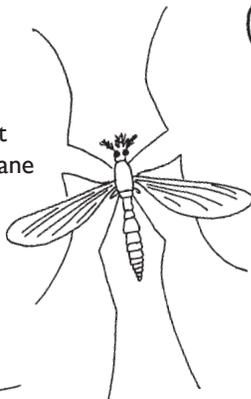
To find some night-blooming flowers, watch for flowers that are closed during the day and open as the sun sets. If you find a light-colored flower that only smells good at night, you probably found a flower that depends on moths for pollination.



evening primrose

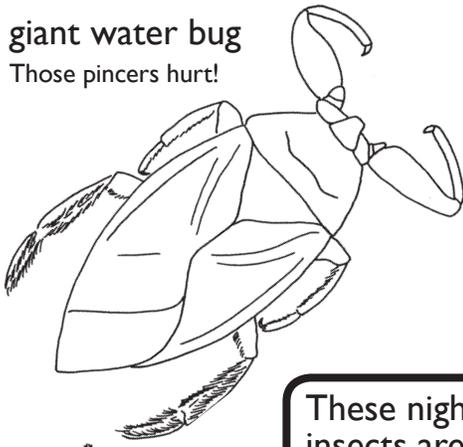
crane fly

Looks like a giant mosquito, but crane flies don't bite!



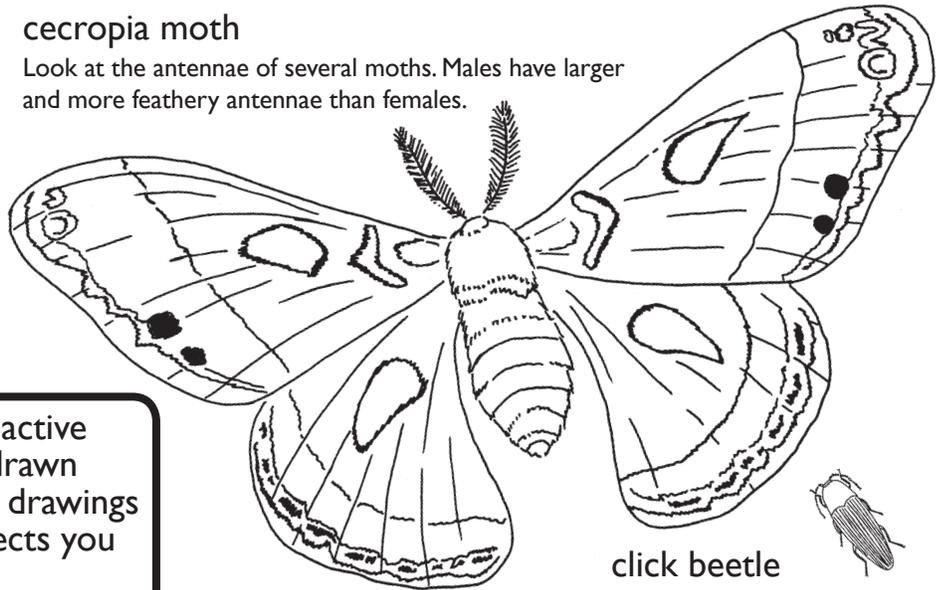
underwing moth

giant water bug
Those pincers hurt!

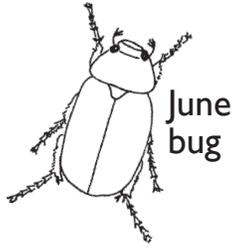


cecropia moth

Look at the antennae of several moths. Males have larger and more feathery antennae than females.



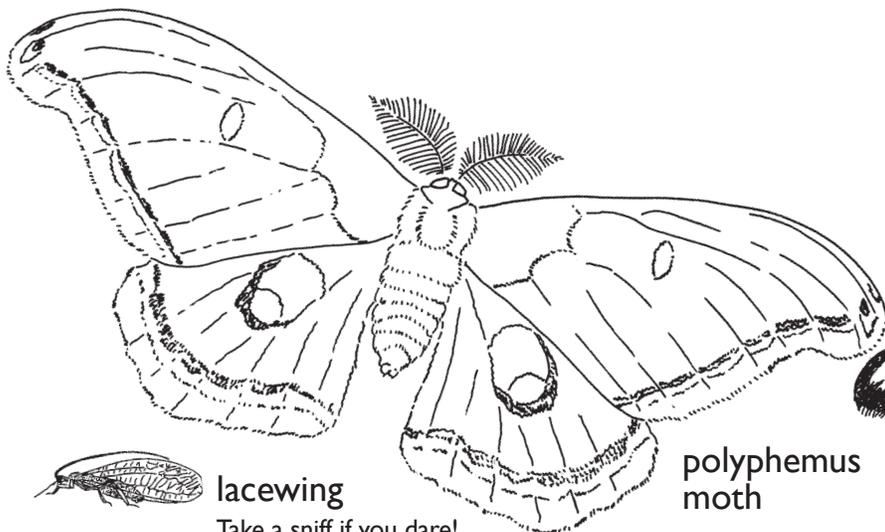
These night-active insects are drawn lifesize. Add drawings of other insects you see.



June bug

click beetle

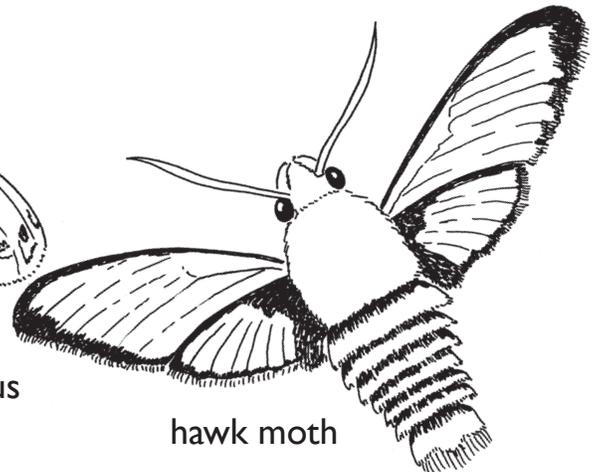
Turn a click beetle on its back on a hard surface to find out how it got its name.



lacewing

Take a sniff if you dare!

polyphemus moth



hawk moth

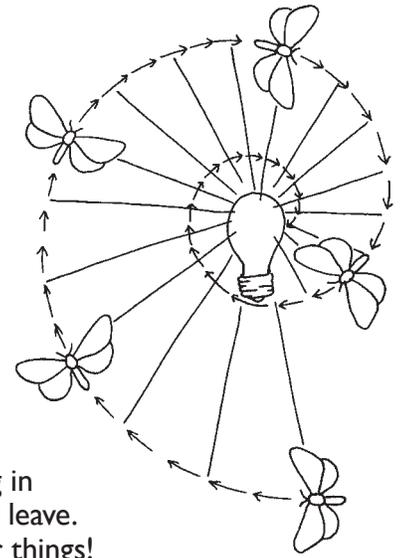
NAVIGATE LIKE A MOTH

Why are moths attracted to lights? It might be better to ask, "Why are moths confused by lights?"

Go to an open field on a moonlit night. Stand so you can see the moon out of the corner of your eye. Start walking, trying to keep the moon just visible. Are you walking in a fairly straight line? You (and moths) can use the moon to navigate because it is so far away.

Now try the same experiment with a light on a building or post. What happens as you try to walk and still see the light out of the corner of your eye? You will probably find yourself starting to walk in circles!

This might be what happens to moths. Some scientists think moths use the moon to navigate. When they try to navigate using our lights, they end up flying in circles toward the light. Once they are at the light, they might be too blinded to leave. Or, maybe, they associate the light with the sun and think it is time to rest. Poor things! Turn out your lights and go to bed so the moths can get on with their lives!



NAME THAT ANIMAL GROUP

You wouldn't be surprised if someone talked about a herd of deer, a swarm of bees, or a flock of ducks. But what if someone said they saw a flutter of moths? Or a knot of frogs? Or a business of flies? Through the years, people have given groups of animals some very interesting names. Match the animals in the list below to these group names.

Bed of _____

Pack of _____

Siege of _____

Wake of _____

Knot of _____

Scurry of _____

Slither of _____

Prickle of _____

Parliament of _____

Scourge of _____

Mischief of _____

Lounge of _____

Smack of _____

Band of _____

Charm of _____

Kettle of _____

Gaggle of _____

Murder of _____

Flutter of _____

Hum of _____

Cloud of _____

Army of _____

lizards
snakes
mice
worms
jays
bats
owls
ants

squirrels
porcupines
geese
butterflies
bees
hawks
wolves
crows

whooping cranes
hummingbirds
turkey vultures
mosquitoes
jellyfish
toads

I explored during the night by ...

- Going to the lights.
- Shaking keys.
- Putting up a white sheet.
- Fixing a snack.
- Navigating like a moth.
- Naming animal groups.
- Watching while I waited.

If you have all the answers right, the animal names will be in reverse alphabetical order.

WATCH WHILE YOU WAIT

While you are out at night, watch, listen, and smell for other nighttime animals.

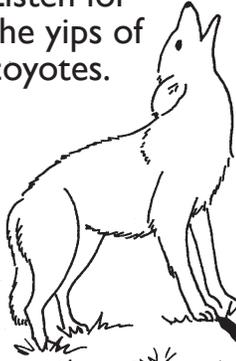


Watch birds flying at night.



Search the sky for night-flying insectivores like nighthawks.

Listen for the yips of coyotes.



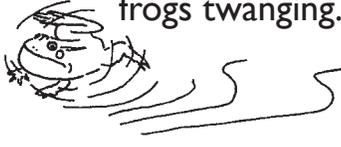
Check out fireflies' lights.



Sniff for skunks.



Follow the sounds of green frogs twanging.



Listen for the yodeling calls of loons.



TAKE FIELD NOTES

Use pictures or words to record what you saw, heard, and smelled at night.

OF MAMMALS ON EDGE

Mammals are often on some type of edge! Many are awake on the edge—between day and night. Some are found on the edges between two habitats, such as where a forest meets a field. And, because many mammals are prey—they are constantly on the lookout for danger—they are simply on edge!

EDGE YOUR WAY CLOSE TO A MAMMAL

It's not easy to get close to an edgy mammal. Besides, you don't want to get too close! They already have enough to do—finding food, avoiding predators, raising young, and getting some rest. They don't need to waste energy running away from you. You also need to stay clear for your own safety. Mammals that feel trapped or in danger can attack with sharp claws, hooves, antlers, and teeth. Take a look at some adaptations that mammals have for avoiding you. Then check out the wildlife watching tips in the field notes.

FIELD NOTES

Wildlife watching tips

Most mammals see, hear, and smell us long before we know they are there. We want to get close to see them without getting so close that we disturb them. Try these tips.

Look at the right times.

See page 15 for hints on when mammals are active. Remember that some mammals hibernate or sleep all winter.

Think like an animal.

Walk so the wind is blowing in your face. You want the wind to blow your scent away from the animals you are approaching. Stay low so your silhouette is hidden by vegetation. Walk quietly.

Be patient.

Stop, look, and listen often.

Treat animals with respect.

Remember you are the visitor in their homes. As soon as you spot an animal, stop and just watch it.

Do not feed them.

It might be tempting to offer food to get animals to come closer. Animals **should** be afraid of humans! People food can be harmful to them and might cause them to approach people.

eyes

The eyes of prey species like deer are located on the sides of their heads so they can see you coming from almost every direction.

noses

Mammals are equipped with very sensitive noses.

countershading

White belly fur camouflages mammals by concealing their shadows.

ears

Most mammals have large ears that can be pointed and rotated in different directions to detect the slightest sounds.

behavior

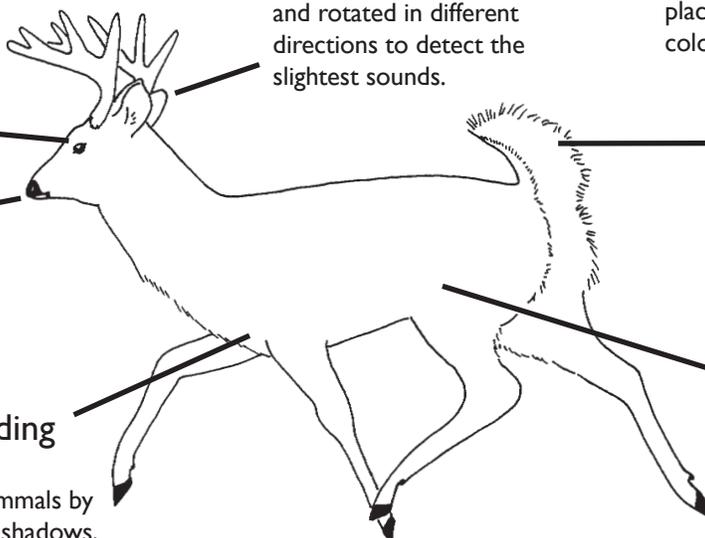
Mammals often freeze in place, using their camouflage colors to help them hide.

tails

Some mammals use their tails to communicate. A deer's "flag" tail says, "I see you." A skunk's raised tail says, "Get away from me!"

camouflage

Most mammals are shades of brown, black, and gray.



FIND OUT MORE

Read *Survival - Could You Be a Deer?* by Roger Tabor.

SEARCH ON THE EDGE OF DAY & NIGHT

You will have better luck finding mammals if you know when they are most active. Use the chart below to help you. Remember that these animals might be active at times not shown on the chart if they are hungry or if they have been disturbed. Some small animals have to be active all the time just to find enough to eat! When you see a mammal, write the date, time, and place on the line. This is only 28 of the 65 mammals in Wisconsin. If you find some that are not on this list, write them in the blanks.

Wisconsin mammals	Date, time, & place I saw it
Virginia opossum <input type="radio"/> 	_____
Short-tailed shrew <input type="radio"/>  <input type="radio"/> 	_____
Eastern mole <input type="radio"/>  <input type="radio"/> 	_____
Big brown bat <input type="radio"/> 	_____
Little brown bat <input type="radio"/> 	_____
Coyote <input type="radio"/> 	_____
Red fox <input type="radio"/> 	_____
Black bear 	_____
Common raccoon <input type="radio"/> 	_____
American mink <input type="radio"/>	_____
American badger <input type="radio"/>	_____
Striped skunk <input type="radio"/>	_____
Flying squirrel <input type="radio"/>	_____
Woodchuck <input type="radio"/>  	_____
Eastern gray squirrel <input type="radio"/> 	_____
Eastern fox squirrel <input type="radio"/>  	_____
13-lined ground squirrel <input type="radio"/> 	_____
Eastern chipmunk <input type="radio"/> 	_____
Red squirrel <input type="radio"/> 	_____
American beaver <input type="radio"/> 	_____
Meadow vole <input type="radio"/>  <input type="radio"/> 	_____
Muskrat 	_____
Deer mouse <input type="radio"/>	_____
Meadow jumping mouse <input type="radio"/>	_____
Common porcupine <input type="radio"/>	_____
White-tailed deer 	_____
Snowshoe hare 	_____
Eastern cottontail <input type="radio"/> 	_____
_____	_____
_____	_____

FIELD NOTES

Active times

-  Diurnal animals are active during the day.
- Nocturnal animals are active at night.
-  Animals that live on the edge-between night and day-are crepuscular (krih-PUS-que-ler). They are active during dawn and dusk and on bright moonlit nights. They sleep during bright daylight and dark night. Why do they live a split life? Prey might do it to avoid diurnal and nocturnal predators. Predators might do it to catch more prey!



deer mouse
brown with white belly
tail as long as body



meadow jumping mouse
brown with white belly
tail longer than body
extra large back feet



short-tailed shrew
dark gray fur
short tail
small eyes



meadow vole
gray brown fur
short tail
big eyes

FIND OUT MORE

Borrow an Explorer Pack from park staff. It contains exploring tools and **Critters of Wisconsin Pocket Guide** by Ann McCarthy to help you identify these mammals.

SEARCH ON THE EDGE OF ROADS

Another place to see mammals (and other animals, too) is along roadways. Roads are great for people. We can use them to travel to school and work. They lead to friends' homes and great vacation spots. But roads aren't great for wild animals.

Roads often cut right through animal habitats, separating feeding areas from resting or nesting areas. Some animals try to avoid roads because of the noise and lights, but other animals, like scavengers, are attracted to roads because they find plenty to eat there. As you ride to and from the park, watch for dead animals (roadkills) and fill in this chart. A couple of samples will help you get started.



Dead animal	Adult or young?	Kind of road?	Speed limit?	Moon phase/ weather?	Why do you think the animal was on the road?
deer	young	interstate	65	full/clear	crossing road to get to corn field
opossum	adult	gravel	45	quarter/rainy	feeding on a dead raccoon by side of road
turtle	adult	county road	55	full/rainy	crossing to lay eggs
owl	unknown	suburban road	45	new/clear	hunting and flew too close to road

TELL 'CROSS THE ROAD' JOKES!

Why did the wild turkey cross the road?

It was the chicken's day off.

What do you call a chicken that crosses the road without looking both ways?

Dead.

Why did the gum cross the road?

Because it was stuck on the chicken's foot.

Why did the rubber chicken cross the road?

To stretch her legs.

Why did the crow cross the road?

To prove he wasn't a chicken.

Why did the otter cross the road?

To get to the otter side.

Why did the turtle cross the road?

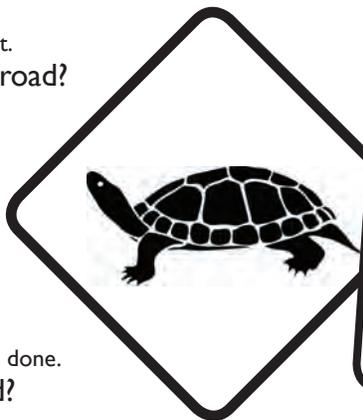
I don't know, he hasn't gotten there yet.

Why did the raccoon cross the road?

To prove to the opossum that it could be done.

Why didn't the skeleton cross the road?

Because he didn't have the guts.



I explored mammals on edge by ...

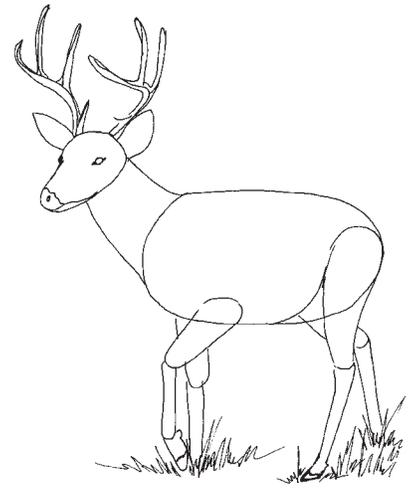
- Practicing wildlife watching techniques.
- Searching for crepuscular, nocturnal, and diurnal mammals.
- Looking for roadkilled animals.
- Laughing at silly jokes.
- Sketching a mammal.

SKETCH A DEER

While you are out there looking for wildlife, take some time to do some sketching. Wisconsin's state wildlife animal is a good place to start. You can sketch a white-tailed deer from memory, from a sighting, or from a photograph. Look at this example, then give it a try. First, sketch the basic shapes. Then begin to add details. Remember, pencils have erasers!



USDA photo by Scott Bauer

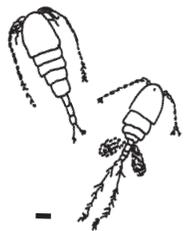


UNDER THE WATER

Animals and plants that spend most of their time underwater must have some amazing adaptations to survive in their watery world. Check out these!

SEE "INVISIBLE" ANIMALS

Transparent life floating in the water is almost invisible. To see these animals, you will need a zippered sandwich bag and some patience. A magnifying lens will really help. Dip the bag into a pond or lake. Hold a dark piece of paper or cloth behind the bag and look for moving things. When you are done, be sure to pour the water (and animals!) back into the pond. If you scoop in more than one pond, use a new sandwich bag for each so you don't move plants or animals (especially non-native ones). Draw the transparent animals you see.

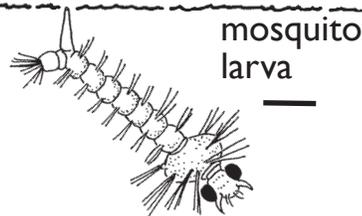


copepods



phantom midge

— = actual size

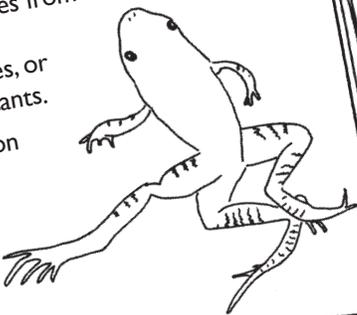


mosquito larva



clam shrimp

FIELD NOTES
Malformed frogs
 Growing up and living in an aquatic world isn't always a snap. Sometimes things go terribly wrong. If you look at enough frogs, you are going to find one with an extra leg or an eye in the middle of its head.
 Things probably go wrong during the early tadpole stages. Scientists see four possible causes, including injuries from predators, parasites, nutritional deficiencies, or environmental pollutants.
 For more information on frogs, search for A Thousand Friends of Frogs on the Internet.



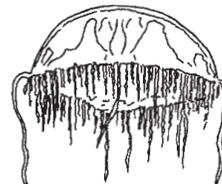
water flea



fairy shrimp



freshwater jellyfish
(not native to Wisconsin)



SEARCH FOR A SINISTRAL SNAIL

There are two groups of snails living in Wisconsin's lakes, streams, and ponds—gilled snails and lunged snails. Gilled snails have a door (operculum) attached to the "foot" which can close the opening to the shell. Their shells are usually dextral (see Field Notes). Lunged snails can tolerate poorer water quality because they can obtain oxygen from the air. Their shells are usually sinistral. Of the dozens of freshwater snails living in Wisconsin, here are some that you might find. They are shown about life size. Tiny snails are shown enlarged so you can see what they look like!



sinistral pondsnail
Physella
20 mm tall

brown mystery snail
Campeloma
25mm tall

pebblesnail
Somatogyrus
4 mm tall

fossaria
Fossaria
3-13 mm tall

pondsnail
Amnicola
7mm tall

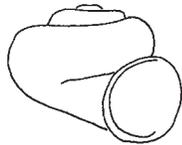


hornsnail
Pleurocera
20 - 40 mm tall

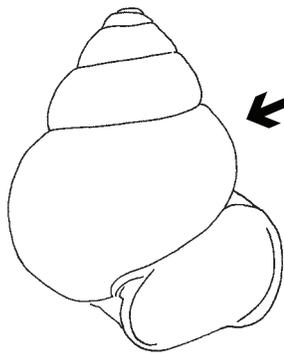
two-ridge ramshorn
Helisoma
9 -15 mm wide



sinistral-even though at first glance it looks dextral



valve snail
Valvata
5 mm tall



Chinese mystery snail
Cipangopaludina
to 65 mm tall!

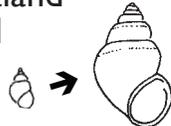
SINISTER SNAILS

These two snails are not *sinistral*, they are *sinister*! People brought them here from other countries and now they are crowding out our native freshwater snails!



New Zealand mud snail

Potamopyrgus
5 mm tall



FIELD NOTES
Dextral or sinistral snails
Snails are either left-"handed" or right-"handed." Find a snail and hold the shell upright so the tip is pointing away from you and the opening is toward you. If the shell opens to the *right*, the snail is dextral (right-handed). If the shell opens to the *left*, the snail is sinistral (left-handed).

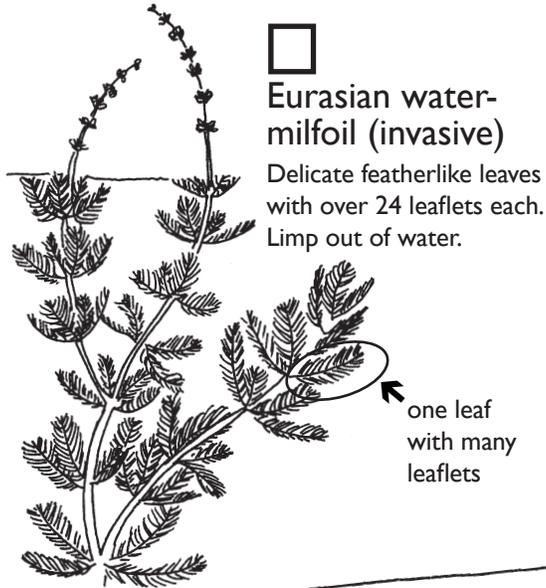
dextral

sinistral

SKETCH THE SNAILS YOU FOUND

WATCH OUT FOR MILFOIL

While you are out swimming, exploring, boating, and playing in the water, watch out for Eurasian water-milfoil. It is an invasive plant from Europe, Asia, and northern Africa that has invaded Wisconsin waters. In spring, it grows extremely fast and quickly blocks the sunlight that native aquatic plants need to grow. If we aren't careful, we can help it spread from one lake to another. All it takes is one small piece of the plant stuck on a boat, trailer, or fishing gear. If that piece of plant is taken to a new lake, it can grow into a whole new plant! Learn to identify invasive water-milfoil and be careful. How many native underwater plants can you find that look like Eurasian water-milfoil?



Eurasian water-milfoil (invasive)
Delicate featherlike leaves with over 24 leaflets each. Limp out of water.

one leaf with many leaflets



common water-milfoil (native)
Stiff feather-like leaves with 14 to 20 leaflets each. Stiff out of water.



chara (native)
Multicellular algae that smells like a skunk and feels crunchy.



coontail (native)
Olive-green plant with leaves growing in whorls. Leaves are forked.

FIELD NOTES

Insect-eating plant!

Bladderworts "eat" insects to get enough nutrients to survive. Look on bladderworts' underwater leaves for little (●) sacs, called bladders. Each bladder is really a tiny trap. When an aquatic insect touches one of the bladder's trigger hairs, the trapdoor opens, the bladder sucks in the insect, and the door slams shut.

Bladderwort (an extreme name to begin with) floats near the water surface in lakes, ponds, and ditches. It has no roots, and all of the leaves are under the water. It's easiest to find in summer. Look for 8" stalks sticking out of the water with yellow or purple flowers that look like snapdragons.

- I explored under the water by ...

 - Finding see-through animals.
 - Catching and looking at frogs for malformities.
 - Searching for sinistral snails.
 - Looking for aquatic plants.
 - Finding the insect-eating bladderwort!

Exploring the Extremes ...

WHILE CAMPING ON EARTH

Imagine camping 100 years ago. No campsites. No reservations. No bathrooms.

Camping was an adventure. People loaded up some things in the car and drove into the country. They found a pretty place and set up camp. Nothing fancy.

Where did they go to the bathroom? What did they do with their trash? Were they careful about where they camped and where they built fires? What did they take? What did they do without?



Camping gear	What year do you think people first used this invention while camping?	What do you think people used before the invention?
1 - coolers		
2 - flashlights		
3 - sunscreen		
4 - plastic trash bags		
5 - DEET (insect repellent)		
6 - paper towels		
7 - cellular phones		
8 - weather radios		
9 - paper plates		
10- sliced bread		
11- charcoal briquettes		
12- can openers		
13- Frisbees™		
14- bottled water (single)		
15- soda in cans		
16- aluminum foil		
17- Band-Aids™		
18- toothpaste in tubes		
19- s'mores		

Approximate year people could use for camping: 1) 1954, 2) 1898, 3) 1944, 4) 1950, 5) 1957, 6) 1931, 7) 1983, 8) 1921, 9) 1904, 10) 1928, 11) 1897, 12) 1858, 13) 1948, 14) 1968, 15) 1953, 16) 1928, 17) 1921, 18) 1892, 19) 1910

CHECK YOUR GREEN SCORE

Everyone is talking about going ‘green’ — taking care of the earth by consuming fewer resources, recycling, and changing the way they do things. When it comes to camping, each family does it a little differently. Some set up a “home away from home” at their campsites. Others take pride in leaving modern conveniences behind and “roughing it.”

Whether your family is one of these extremes or somewhere in the middle, do a green check. For **one day**, keep track of how you and your family camp. You can earn points for recycling, using fewer resources, and taking care of the park. You will lose points for things that consume fossil fuels or use more resources. As you look over this list with your family, talk about things that you simply can’t do, things that you don’t want to give up, and things that you could work to change. Point values are in bold. Tally up your score—the higher your score, the greener you camp!



PLAYING AT THE PARK

- ___ We enjoy fishing, hiking, biking, canoeing, kayaking, wildlife-watching, and swimming at the park. (2)
- ___ I stay on trails. (1)
- ___ We take our bikes when we camp so we can get around without using the car. (1)
- ___ Subtract 1 point for each car trip you make.
- ___ Subtract 1 point for each motorized vehicle you use (e.g., boat, ATV, jet ski).



KEEPING MYSELF BUSY

- ___ I explore nature around the park. (1)
- ___ Subtract 1 point for each electronic or battery-operated device you use (e.g., mP3 player, video game, computer, TV, DVD player).



STAYING HYDRATED

- ___ We drink water supplied at the campground. (2)
- ___ I use a refillable water bottle. (1)
- ___ Subtract 1 point for each can or bottle of soda, water, or juice that you drink.



COOKING & EATING

- ___ We buy food in bulk and repackage it in reuseable containers for camping. (2)
- ___ We make sure animals can’t get into our food. (1)
- ___ We eat foods that do not need to be cooled. (1)
- ___ Subtract 1 point if you use electricity to keep your food cold.



DOING DISHES

- ___ We use biodegradable soap and dump dishwater in designated areas or away from water. (2)
- ___ Subtract 1 point for each kind of disposable your family uses (e.g., plates, cups, plasticware, napkins, paper towels).
- ___ Add 1 point for each kind of reusable your family uses (e.g., plates, cups, silverware, cloth dish towels, cloth napkins).



TAKING OUT THE TRASH

- ___ We pick up other campers’ garbage. (1)
- ___ We properly dispose of trash or garbage in the containers provided. (2)
- ___ We have a separate bag for recyclables that we put in recycling bins or take home to recycle. (2)
- ___ Subtract 1 point for each recyclable item that gets thrown in the trash.
- ___ Subtract 1 point for each piece of trash or recyclable item burned in the campfire.



ENJOYING A CAMPFIRE

- We build a campfire that is just big enough for what we need. (1)
- We only build fires in firerings. (1)
- Our firewood came from within 25 miles of the park. (1)



VACATIONING WITH PETS

- We keep our pet on a leash all the time. (2)
- Subtract 1 point each time your pet is off leash.
- Subtract 1 point each time your pet's poop is not cleaned up.



TAKING CARE OF MY PERSONAL BUSINESS

- I use the camp bathroom. (2)
- When backpacking or in remote areas, I bury my number 2. (1)
- Showers? Who needs a shower when you are camping!? (1)
- Subtract 1 point for each shower you take. Subtract 2 points for a hot shower.
- Subtract 1 point for each electrical thing you use (e.g., hair dryer, curling iron, flat iron, electric toothbrush).



RELAXING AT NIGHT

- We go to bed with the sun. (1)
- We use crank-type flashlights. (1)
- We just enjoy the light of the campfire. (1)
- Subtract 1 point for each light bulb or lantern you use.



SLEEPING

- We sleep in a tent. (1)
- Subtract 2 points if your family uses a camping vehicle (e.g., popup, camper, trailer, RV).
- Subtract 1 point for each fan or air conditioner your family uses.



SCORE

over 25 points –

You can't be much greener, but you can try!

13 to 24 points –

You're greener than average.

2 to 12 points – You're green around the edges, but look for ways to raise your score.

1 point or less – You have a long way to go, but many opportunities!

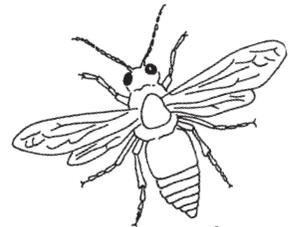


RAISE YOUR SCORE

Whether you are RVing, tent camping, or backpacking, you can probably camp a little greener if you want to. Look back at the list with a grown-up. Find at least two things that you could try on your next camping trip and write them here:

IN SPITE OF EAOPs

What are EAOPs? Extremely Annoying Outdoor Pests, of course! Ticks, mosquitoes, no-see-ums, bees, and leeches seem ready to ruin the fun of being outside. Circle the ones that you see at the park.

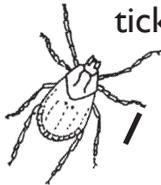


hornet

— = actual size of body



deer tick



wood tick



deer fly



honeybee



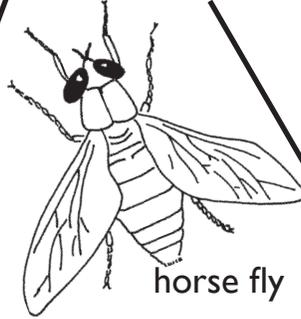
mosquito
(spanish for "little fly")



chigger



no-see-ums



horse fly



yellow jacket

RANK OUTDOOR PESTS

Do you think that all EAOPs are equally annoying? Rank these outdoor pests. Put a number 1 by the pest that you think is most annoying. Put a number 2 by the second most annoying, and so on.

- ___ ants *
- ___ bees *
- ___ blackflies
- ___ chiggers
- ___ deer flies
- ___ giant water bugs *
- ___ hornets and wasps *
- ___ horse flies
- ___ leeches
- ___ mosquitoes
- ___ no-see-ums
- ___ swimmer's itch flatworms
- ___ ticks

Look back at your list. Pests marked with * only bite or sting in defense. Does it matter to you whether they do it on purpose or not?

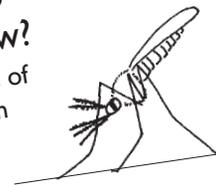
The flatworms that cause swimmer's itch are parasites (something that lives off of another plant or animal) in search of a host. They have to burrow under our skin to find out that we are the wrong host. Fortunately, they die quickly.

Only **female** mosquitoes, no-see-ums, blackflies, horse flies, and deer flies bite us on purpose. They need protein-rich blood in order to produce eggs.

FIELD NOTES

What is biting me now?

Wisconsin has about 55 kinds of mosquitoes, but most of them are in one of these groups.



Anopheles

If the mosquito holds its head, thorax, and abdomen in a straight line with the abdomen pointing into the air, it is an Anopheles (uh-NOF-uh-leez) mosquito. These mosquitoes breed in permanent fresh water.



Aedes

If the mosquito rests parallel to the surface, it is probably an Aedes (ay-EE-deez) mosquito. Aedes mosquitoes breed in floodwaters. They are strong fliers.

Culex

Mosquitoes that breed in quiet or stagnant temporary water are probably Culex (Q-lex) mosquitoes. They are weak fliers and rarely bite when it is windy.



To read an African legend about mosquitoes, check out *Why Mosquitoes Buzz in People's Ears* by Verna Aardema.

TEST MOSQUITO-AVOIDANCE TACTICS

Do mosquitoes seem to like you or someone in your family? Scientists know that mosquitoes are attracted to the carbon dioxide that we exhale, sweat, body odors, and heat. Here are some things that you can try to reduce the number of mosquitoes that bite you. You might want to keep these experiments a secret. Some of the things you try might result in the people around you being bitten more! Check off the things you try and record what happened.

Ways to avoid being bitten by mosquitoes	Here's what happened when I tried it!
<input type="checkbox"/> Hold my breath.	
<input type="checkbox"/> Wear light-colored clothes.	
<input type="checkbox"/> Use an insect repellent.	
<input type="checkbox"/> Take a shower or at least wash my feet. (Mosquitoes like human foot odor.)	
<input type="checkbox"/> Stand next to someone who ate bananas.	
<input type="checkbox"/> Take it easy. (Active people produce more carbon dioxide and heat.)	
<input type="checkbox"/> Stand next to a blonde woman. (Scientists don't know why, but they get bitten more.)	
<input type="checkbox"/> Stand next to someone wearing strong perfume or cologne.	
<input type="checkbox"/> Eat citrus fruits or garlic. (Circle the one you tried.)	
<input type="checkbox"/> Stop being nervous about being bitten by mosquitoes. (Can mosquitoes sense fear?)	
<input type="checkbox"/> Stand in a sunny, breezy spot.	
<input type="checkbox"/> Stand next to a fire or burning candle.	
<input type="checkbox"/> Stand next to a person bigger than me. (They are a larger target for the mosquitoes!)	

I explored EAOPs by

- Ranking outdoor pests. My least favorite is _____
 - Testing mosquito-avoidance tactics. The thing that works best for me is to _____
- _____

Exploring the Extremes ...

THROUGH TIME

Go to a forest and imagine you are the size of a small action figure. Pebbles are huge boulders. Ferns look like trees. You are surrounded by giant green plants. It is shady and wet. It's 300 million years ago.

FIND EXTREME SURVIVORS

Fast-forward to today. Look around. Look down. So much has changed, yet descendants of those ancient plants somehow survived. They are much smaller. How many of these living fossils can you find?

scouring rush (up to 5 feet tall)

maidenhair fern (1 to 2 feet tall)

bracken fern (2 to 3 feet tall)

interrupted fern (2 to 4 feet tall)

field horsetail (18 inches tall)

shining clubmoss (4 to 6 inches tall)

ground pine (10 inches tall)

staghorn clubmoss (10 inches tall)

polypody fern (4 to 10 inches tall)

WATCH FOR TOUGH COMPETITORS

Ferns, club mosses, and horsetails survived droughts, glaciers, dinosaurs, floods, and millions of years of changes. Could they finally have met their match? Could invasive plants, such as garlic mustard and buckthorn, ultimately defeat the ferns and their allies?

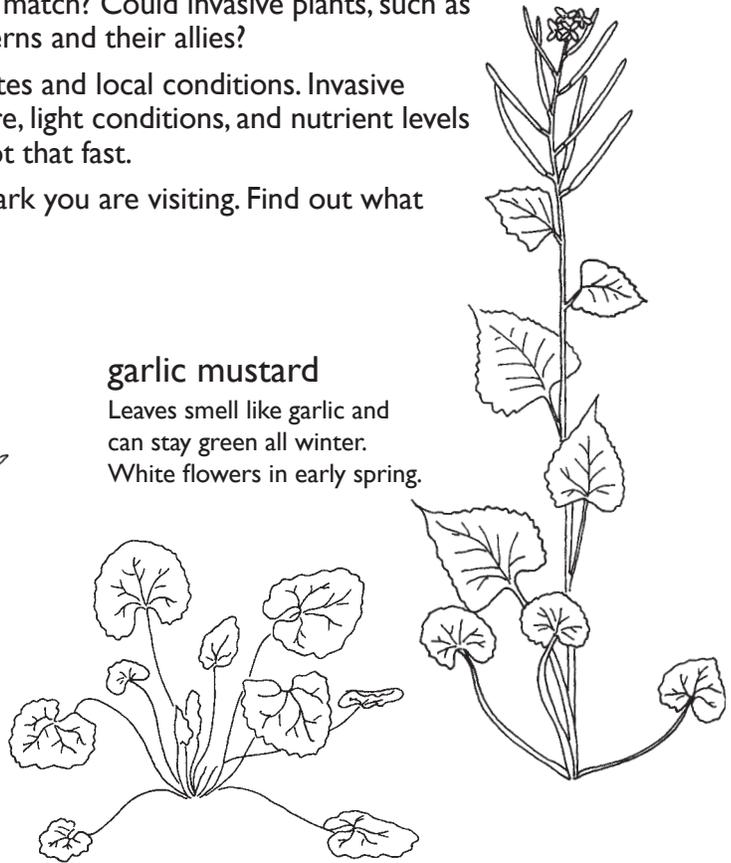
Ancient plants have slowly adapted to changing climates and local conditions. Invasive plants come into a forest and change the soil moisture, light conditions, and nutrient levels in just a couple of years. Most native plants can't adapt that fast.

Ask park staff if there are any invasive plants at the park you are visiting. Find out what they look like and watch for them while you hike.



buckthorn

Leaves appear early in spring and stay green late into fall. Black fruits in fall and winter.



garlic mustard

Leaves smell like garlic and can stay green all winter. White flowers in early spring.

SAVE THE NATIVES

You can help prevent invasive plants and animals from taking over your favorite places. Check the things you can do!

- I can learn how to identify invasive plants and animals.
- I can clean soil, seeds, and other plant parts from my shoes, clothes, hair, pets, watercraft, and other gear before and after playing. I will do this in the parking lot so I don't move invasive plants around.
- I can throw the things I clean off into a garbage can.
- I can leave "seed-loving" clothes (such as Velcro, fleece, and other fuzzy materials) at home.
- I can remember not to pick flowers or other plant parts.
- I can remember not to move firewood.
- I can remember not to move animals from one place to another.
- I can stay on trails when hiking, biking, and playing in the park.
- I can volunteer to help remove invasive species.
- I can "leave no trace" everywhere I go. For more information, visit <www.lnt.org>.

FIND OUT MORE

Visit [EEK!](http://dnr.wi.gov/eek/nature/habitat/forest1.htm) to find out more about the native plants and animals that live in Wisconsin's forests. <<http://dnr.wi.gov/eek/nature/habitat/forest1.htm>>

You can learn more about invasive plants and animals at <<http://dnr.wi.gov/topic/invasives>> and <<http://dnr.wi.gov/eek/earth/aliens.htm>>.

I explored extreme plants by ...

- Finding plants whose relatives were around 300 million years ago.
- Looking for invasive buckthorn or garlic mustard in the park's forests.
- Saving the natives by checking off the things that I can do.



GO!

GET OUT!

GET OUTDOORS! WISCONSIN!

GET MOVING! GET ENERGIZED! GET A LITTLE DIRTY! JUST ... GET OUT THERE AND EXPLORE!

The grown-ups in your life need you to help them stay active as they get older. Spending time exploring nature with you will help everyone's health and fitness. Look for ways to get out! How many of these activities can you do together this year?



Get Outdoors!

- Become a Wisconsin Explorer.
- Go to a nature program.
- Hike or bike a state trail.
- Recreate at a state recreation area.
- Go camping.
- Take a bird walk.
- Snowshoe or ski through a forest.
- Find a geocache.
- Ride a horse.
- Canoe or kayak down a river.
- Go fishing.



Find out what's happening outdoors by visiting <<http://dnr.wi.gov/eek/nature/season/calendar.htm>>
Find out about activities in the state parks by visiting <<http://dnr.wi.gov/eek/nature/camp/index.htm>>

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240. This publication is available in alternative format (large print, Braille, audio tape, etc.) upon request. Please call 608-266-0866 for more information.

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