Career Critters - Student Sheet

Name: _____ Period: _____ Date: _____

Activating Prior Knowledge:

1. **Describe** the concept of "niche". Include evidence from our activities that supports your description.

2. **Explain** how the niche of one organism might HELP another organism.

3. **Explain** how the niche of one organism might HARM another organism.

4. Looking just at the Ecosystem Map, name some of the ecosystems that you see (ex. farm).

5. Find the stream on the Ecosystem Map. Use your finger to trace the course of the stream. **Describe** where it goes. Which ecosystems does it go through or nearby? **Predict** why this might this be important.

Complete the table below with your "Critter Token" choices.

Issue # & Ecosystem	Summary of Problem	Critter Token	Reasoning
#1 - Prairie			
#2 - Farm (A)			
#3 - Golf Course			
#4 - Urban Stream			
#5 - Farm (B)			
#6 - Stream			
#7 - Pine Forest			
#8 - Garden			

Issue # & Ecosystem	Summary of Problem	Critter Token	Reasoning
#9 – Town Park			
#10 - Downtown (A)			
#11 - Foothills			
#12 - Downtown (B)			

Analysis & Conclusion:

6. **Explain** how any of these solutions could backfire. (In other words, could the plants or animals used to help solve certain problems end up being a problem themselves?) Think of AT LEAST two examples.

7. Name any other wild plants or animals (not identified in this activity) that could have been used to help solve the ecosystem problems? **Explain how your answer makes sense.**

8. The gambusia fish is not native to many states. **Would it be** okay to introduce non-native species to help with an ecosystem problem? **Predict** the benefits and risks?

9. **Propose** a way that the location of the 12 ecosystems on the map be redesigned to reduce some of the environmental problems?

10. **Hypothesize** the ways that animals, plants, and humans could work together to solve environmental problems?

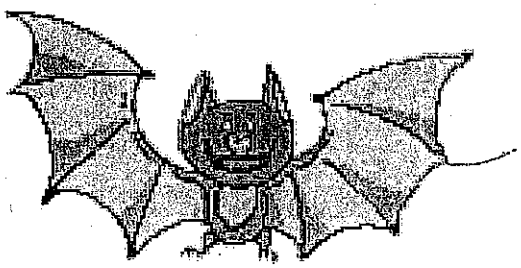
Career Critters – Direction Sheet

Materials:

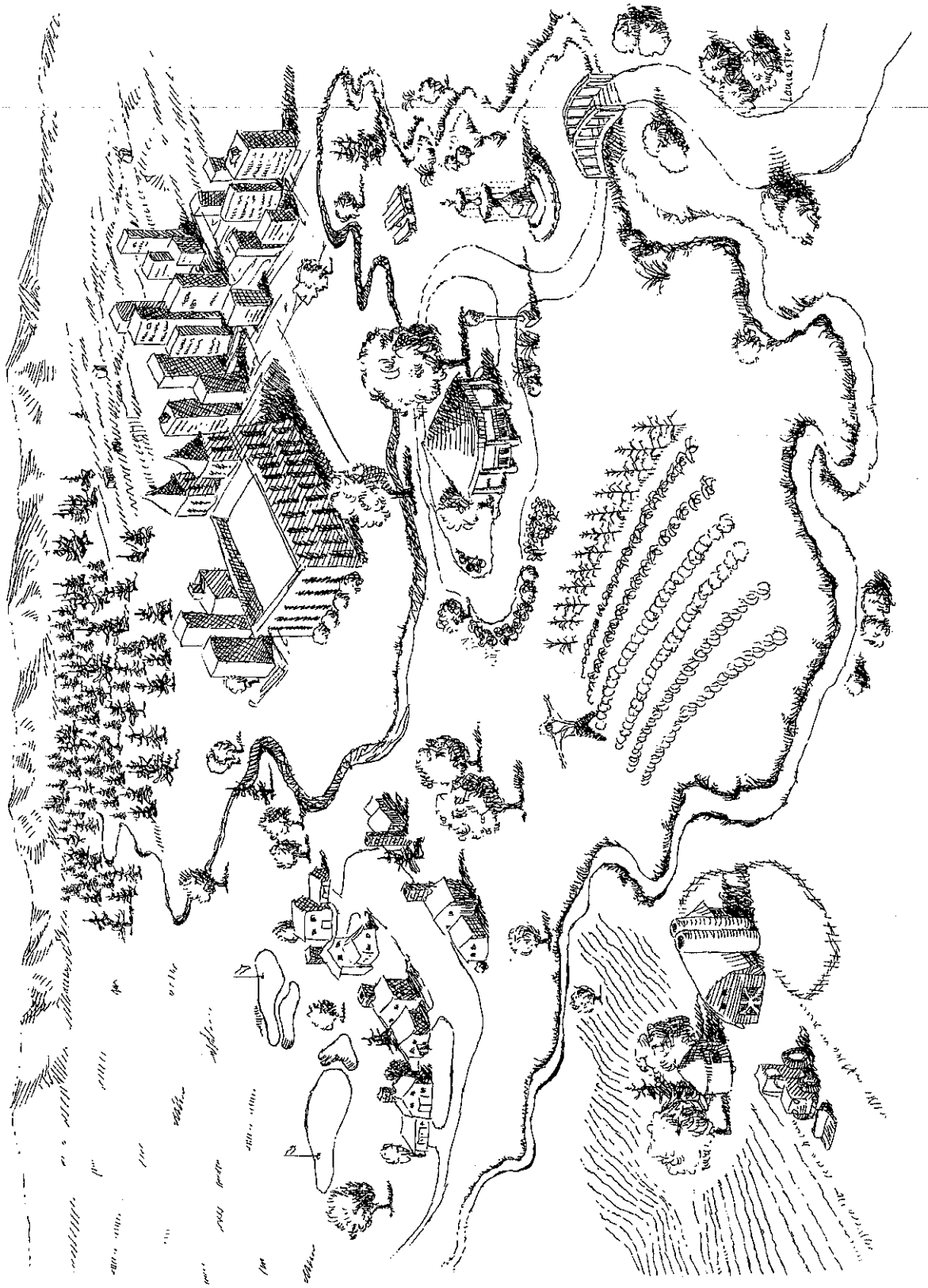
- 1 Ecosystem Map
- 1 set of "Critter Cards" (purple)
- 1 set of "Ecosystem Cards" (blue)
- 1 set of "Critter Tokens" (gold)
- Student Sheet

Procedures:

1. Answer the pre-questions on your student sheet.
2. Take out your "Critter Cards" (purple) and observe the front and read the backs together. Divide up the cards among your group members.
3. Arrange your "Critter Tokens" (gold) neatly around the edge of the Ecosystem Map in any order.
4. Shuffle and stack the Ecosystem Cards (blue) face down beside the Ecosystem Map.
5. The student with the shortest last name draws an Ecosystem card and reads it aloud to the group.
6. Each student examines his or her own "Critter Cards" to determine if those animals or plants could help solve the ecosystem problem described. If so, the student explains how to the group. If the group agrees, a "Critter Token" of that plant or animal is placed on the Ecosystem Map. (hint: more than one plant or animal may be used to solve the problem)
7. Record the information onto your data table (ecosystem issue #, critter(s) used, rationale)
8. Continue drawing Ecosystem Cards until all are used.
9. When all Ecosystem Cards have been drawn and all ecosystem problems have been solved, answer the post-questions on your student sheet.



Ecosystem Map



Ecosystem Cards

#1 Prairie Ecosystem

A prairie ecosystem is near a new housing development on the edge of town. Prairie dogs live in the grassy field. With all the new houses, lots of the prairie dogs' natural enemies—coyotes and eagles—have disappeared. Now the prairie dog population is growing. The prairie dogs are digging burrows and mounds in the lawns of the new homes. They are also eating vegetable gardens and underground telephone wires. Some people are worried that the prairie dogs might carry diseases, and they want to begin poisoning the prairie dogs. As a manager, how could you help solve this problem? What animal(s) or plant(s) in the cards provided could help with this problem?

#2 Farm Ecosystem A

You are a farmer. You store large amounts of grain and hay in your barn and storage bins. The problem is that field mice have discovered the grain, and now you are overrun with them. You could set numerous mouse traps, but this is time consuming. If you set out poison, you may poison birds and other animals by mistake. What animal(s) or plant(s) in the cards provided could help with this problem?

#3 Golf Course Ecosystem

You are the manager of a golf course. You are very proud of your golf course—especially the nearby stream, ponds, and water holes on the course. One problem: there are so many mosquitoes that the golfers are starting to complain. You could spray insecticide around the course to kill the mosquitoes, but it's expensive and probably would harm other animals. What animal(s) or plant(s) in the cards provided could help with this problem?

#4 Urban Stream Ecosystem

A stream ecosystem runs through town. Most of the time there is only a little water in your stream, but when a thunderstorm hits, lots of rain falls on paved streets and parking lots. The rain can't soak into the asphalt, so it runs downhill into the stream. The stream suddenly fills with fast-moving water. This water often carries the oil and gasoline that has dripped on the asphalt from cars. The stream banks erode so trees and shrubs along the edge of the stream sometimes fall, and soil washes away. When the storm is over, the stream gets low again. It is full of dirt, sand, and other pollutants. As a manager, your job is to stop the erosion of the stream bank and to keep the stream from having big changes in the level of water. What animal(s) or plant(s) in the cards provided could help with this problem?

#5 Farm Ecosystem B

You are a farmer. Your crops are turning into a field of dreams for insect pests like grasshoppers. They are eating up your crops. You could spray with insecticides to kill the grasshoppers, but they are expensive. Your field is also close to homes. The homeowners do not want the spray to drift over into their yards. What animal(s) or plant(s) in the cards provided could help with this problem?

#6 Stream Ecosystem

A stream ecosystem runs near a farm. Along the edge of the stream is a nice, green area with lots of willows and tall trees. In the spring and summer, the farmer takes water out of the stream. The water goes from the stream down an irrigation ditch to water a field of crops. As a result, the water level in the stream may drop. Small fish can live in shallow water, but bigger fish need deep, cool pools of water. What animal(s) or plant(s) in the cards provided could help with this problem?

#7 Pine Forest Ecosystem

In your pine forest ecosystem, many of the trees are being damaged by bark beetles. Bark beetles bore through bark and eat the layers of wood inside. Your forest is infested with too many beetles, and a large number of trees have been infected. As a manager, your job is to maintain a healthy forest so that a variety of animals live there. You need to reduce the number of beetles. What animal(s) or plant(s) in the cards provided could help with this problem?

#8 Garden Ecosystem

Your town has a community garden where townspeople plant vegetables. However, this year small insects called aphids are eating the vegetables. People want vegetables to eat. You could spray insecticides to kill the aphids, but some people don't want to use insecticides. They are concerned about possible health effects. The community garden has another problem: the soil is too hard and packed so roots have a hard time growing. What animal(s) or plant(s) in the cards provided could help with this problem?

#9 Town Park Ecosystem

In the town park, some of the old oak trees are dying. They need to be replaced by young oak trees. Of course, that project would need funding. What animal(s) or plant(s) in the cards provided could help with this problem?

#10 Downtown Ecosystem A

Downtown becomes very hot in the summer. The sun shines on the sidewalks and asphalt streets and directly into the windows of buildings. People turn on air conditioning, which uses electricity and indirectly creates air pollution. The pollution makes being outside even more miserable. What animal(s) or plant(s) in the cards provided could help with this problem?

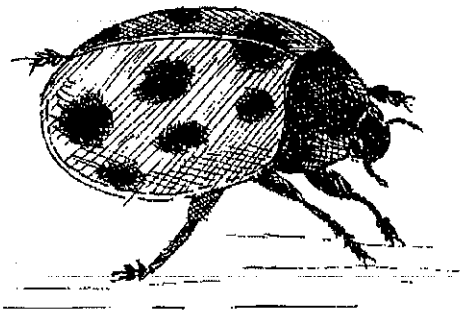
#11 Foothills Ecosystem

On the hills at the edge of town, many houses were going to be built. The bulldozers scraped the ground and plowed the dirt roads to get ready for the new construction. But the construction project was suddenly called off. The soil is now being blown away by the wind and washed downhill into the stream by rainstorms. What animal(s) or plant(s) in the cards provided could help with this problem?

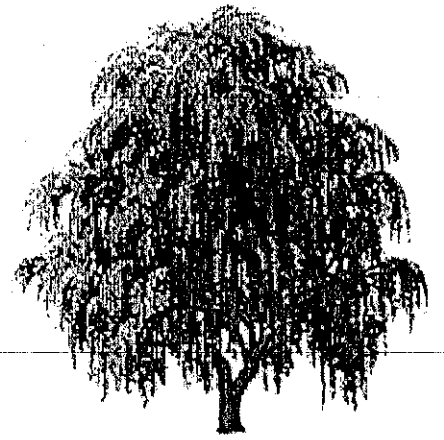
#12 Downtown Ecosystem B

There are many pigeons downtown. They nest on the ledges of buildings. Some people like the pigeons, but others say there are just too many. Their droppings make certain areas really dirty, and the birds may carry diseases. What animal(s) or plant(s) in the cards provided could help with this problem?

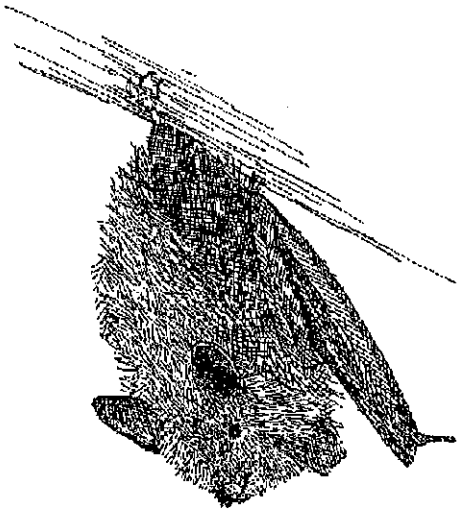
Critter Cards



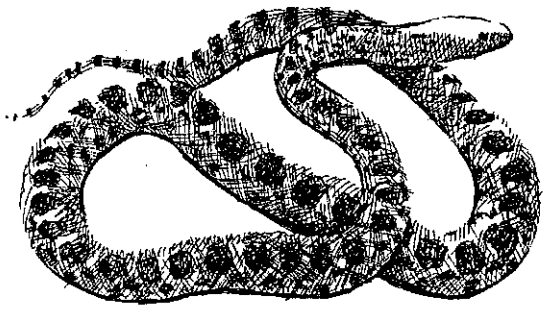
LADYBUGS



WILLOWS



BATS



BULLSNAKES

Information for the Back of the Critter Cards

Willows

We are shrubs that grow along the edges of streams and beaver ponds. Our roots spread out and grow deep. They help hold the soil and keep it from getting washed away by floods.

Ladybugs

We are very small, and we eat other small tasty bugs such as aphids and scale insects.

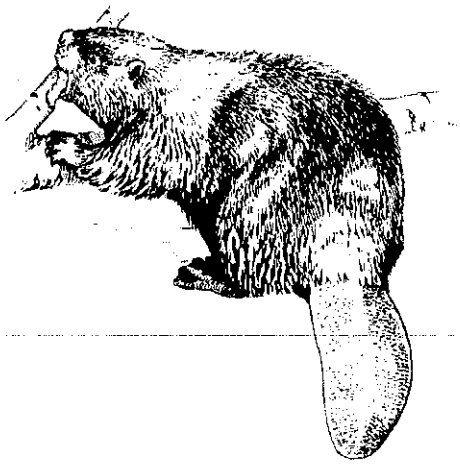
Bullsnakes

We live in dry fields and around farms. We like to eat small mammals like prairie dogs and other rodents. Although we can grow to be very big (eight feet long and as thick as your leg), we are not venomous.

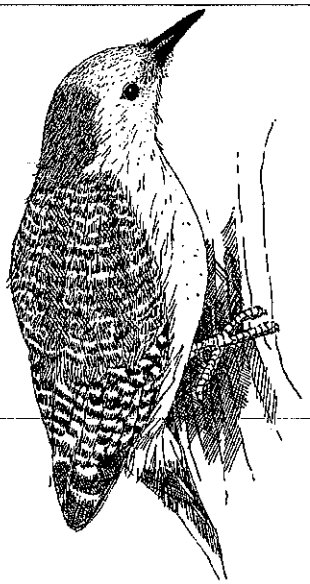
Bats

We are experts at eating flying insects. We swoop around and can eat thousands of flying insects in one night! Some people are scared of us, but we aren't really bad. Besides, we are active at night when most people are asleep.

Critter Cards

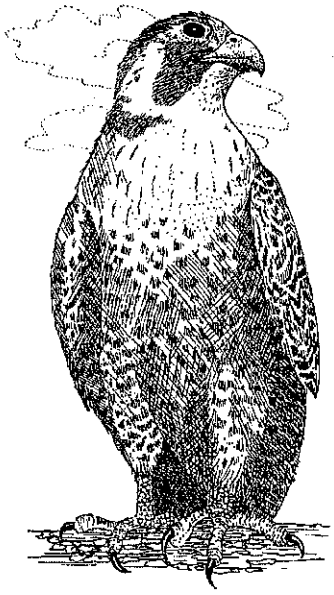


BEAVERS



WOODPECKERS

GRASSES



PEREGRINE FALCONS

Information for the Back of the Critter Cards

Woodpeckers

We live in forests. We peck out the insects that live under the bark of sick or dead trees. We also use our beaks to chip deep holes into trees where we build our nests. Sometimes these holes are used by other birds, such as bluebirds and nuthatches, for their nests. Our holes help to bring new varieties of birds into the forest.

Beavers

Using our big front teeth, we cut down trees and shrubs, chew them into smaller sticks, and build small dams. These dams help to slow down the water in streams and make deep pools. Our dams help to slow small floods.

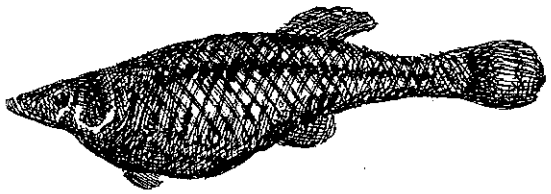
Peregrine Falcons

We are hawk-like birds that are built for speed. We live and nest near high cliffs, canyon walls, and even skyscrapers. We catch smaller birds to eat. Ecosystems with steep walls and plenty of birds can be good places for us.

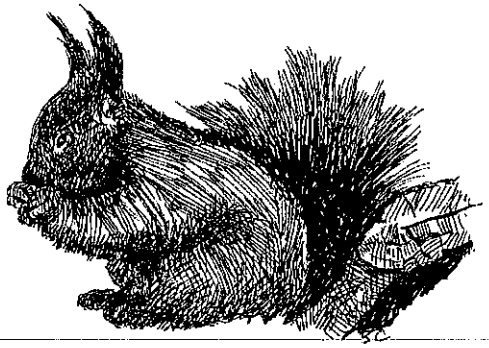
Grasses

We grow fast, and our roots help keep soil from blowing away in the wind and washing away in the rain. We are often the first plants to grow where the soil has been disturbed, and we can tolerate long periods with little water.

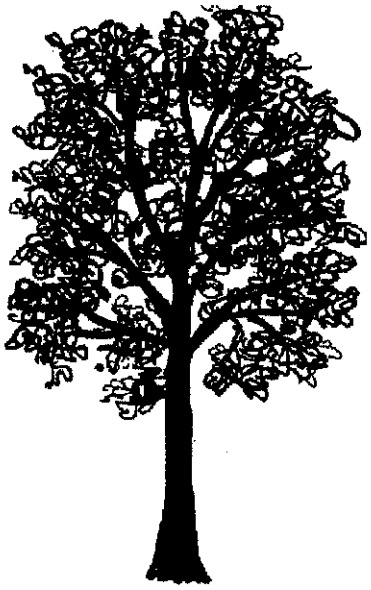
Critter Cards



GAMBUSIA FISH



SQUIRRELS



TREES

MEADOWLARKS

Information for the Back of the Critter Cards

Squirrels

In the autumn, we collect acorns from oak trees and store them to eat in winter. Sometimes we hide our acorns underground. The only problem is we collect so many acorns that sometimes we forget where we've buried them! Some of these acorns sprout and grow into tall trees.

Gambusia Fish

We enjoy the nice warm waters of ponds and lakes. One reason is that mosquitoes do, too! A female adult mosquito lays her eggs in the water. The eggs hatch into wiggly worm-like animals that stay underwater. Eventually, they turn into flying mosquitoes. It's those underwater mosquito wigglers that we love to eat!

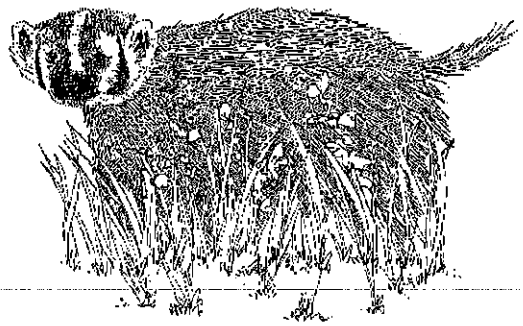
Meadowlarks

We are robin-sized birds that live in fields and on farms. We are known for our beautiful song and the black "V" on our chests. Many people don't know we like to eat many insects.

Trees

Trees do many good things for the environment. Our roots help to hold soil in place. We provide shade and keep areas cool. Our leaves help clear the air of some kinds of pollution.

Critter Cards



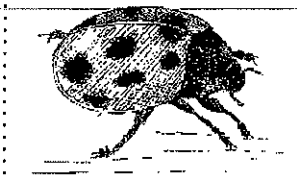
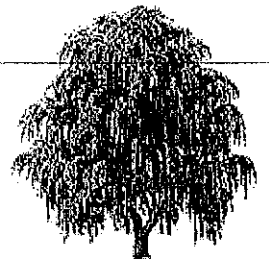
BADGERS

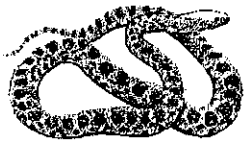
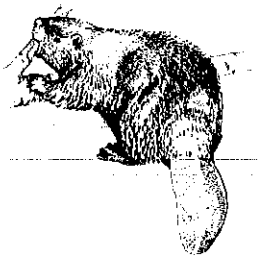
Information for the Back of the Critter Cards

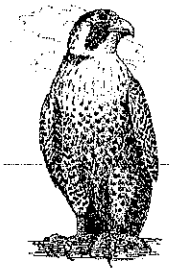
Badgers

We live in underground burrows in dry fields. We are reclusive and avoid people. Although we are not much bigger than a small dog, we are tough and ready to defend ourselves. We dig underground to eat small, furry creatures like prairie dogs and other rodents.

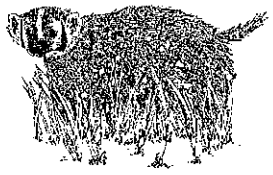
Critter Tokens



Use open spaces to come up with your own critters.