Marsh Munchers

Study Units

Unit 1: Iowa's Waters; Unit 2: Aquatic Life; Unit 3: The World in a Pond

Supplemental Information

This activity discusses a saltwater marsh and focuses on the food web found there. With a few modifications, you can do the same activity for a freshwater marsh. Freshwater marshes found along other bodies of water such as lakes and rivers are interface zones between land and water. Because they are an "edge" type of habitat, they are useful to both aquatic and terrestrial species. One hundred forty-five species of birds are associated with Iowa's wetlands. Wetlands also serve many species of fish, mammals, reptiles, amphibians, and invertebrates.

Additional information about wetlands is found in *Unit 1* and information about aquatic animals is included in *Unit 2*.

Teaching Suggestions

Do the activity, "Wetland Metaphors" before this activity. See the re-write of the activity, "Marsh Munchers" included here.

"Marsh Munchers" For Freshwater Marshes

Materials:

Timer; construction paper or poster board for tokens (eight different colors: one color for each type of prey); animal description/feeding behavior cards (masters included); one envelope or bag per student

Note: This activity is set up for 40 participants; 1/5 predators and 4/5 prey. You may modify the numbers so long as the ratio remains constant.

Procedure:

1. Cut the colored construction paper or poster board into food tokens (20 tokens for each prey item; tokens should be at least 1" x 2"). Reproduce *Feeding Behavior Cards* (one card for each type of predator, four cards for each type of prey). Put one card in each envelope. Place five food tokens in each envelope containing a prey item card. (Hint: You might want to write the name of each animal and the color of tokens that go in each envelope on the inside of the flap.)

2. Describe the marsh habitat in terms of plants and animals present. Also, review the importance of marshes as learned in the activity, "Wetland Metaphors." Focus on the area's high productivity as a place for plants and animals to live. If appropriate for your students, introduce the terms: **predator**, **prey**, **producer**, and **consumer**. Show slides or pictures of plants and animals that live in a marsh to the students. (OPTIONAL: View the audiovisual program, *Aquatic Life*, study the *Aquatic Life* poster, or use the *Biodiversity of Iowa: Aquatic Habitats* CD to acquaint students with aquatic organisms.)

3. Explain that students are going to play a "game" to help them to better understand animals of the marsh.

4. Give each student one envelope. Explain their identity is a secret–they are not to tell **anyone** what they are! The only way others will know what they are is through their feeding behaviors. When you hand out envelopes, explain that some animals will be predators and others will be their food (prey).
5. Have students open their envelopes and see which animal they are. Have them **silently** read their feeding behaviors and remind them not to tell what they are. Emphasize they will not be able to move exactly like the animal they are imitating. (OPTIONAL: If you have not previously studied marsh animals, you should model each behavior first and identify it so students will know which animal does what.)

6. Explain the rules:
   - Each student represents a predator or prey item.
   - Each prey item has 5 food tokens representing 5 individuals of that species.
   - The prey item must give a predator who tags it a token.
   - A growing season (spring, summer) is one playing period of the game.
   - Each predator must get 10 tokens to stay alive through the growing season.
   - Each predator can get **only one** token from each prey item at any one time. A predator can go to another prey item and then return. Each predator should get as many tokens as possible to build up fat reserves in case we have a severe winter.
   - Prey are to continue in their feeding behavior until the predators have taken all of their tokens. When all of their tokens have been taken (they have been eaten) they are to sit quietly and decompose into the marsh.
   - Prey and predators must continue their feeding behaviors throughout the activity.
   - Prey show their feeding behaviors from stationary, squat positions while predators move through the “marsh” and exhibit their behaviors. Point out that sometimes predators actually move around less than their prey items, but in order to tell the predators from the prey, predators will be moving around and prey will stay in one place.

7. Establish a play area (inside or outside). Have students take their envelopes with them. Prey items should spread out and begin to pantomime their feeding behaviors and predators should “stalk” their prey, securing **one food token at a time** from each prey item and placing it in their envelope. NOTE: Animals who fail to pantomime their feeding behavior are “ill.” In the natural world, ill animals are eaten or die of the illness. Therefore, these animals must sit quietly and decompose into the marsh.

8. Call “time” when appropriate (most predators have 10 tokens or most prey items are out of tokens). You may vary the time allowed depending on how fast “predators” move about and how far apart prey place themselves. If students are spread apart, you may allow them to move more quickly and shorten the time for each playing period.

9. Tell students to hold onto their envelopes. Have students sit, either in a group facing you or in a circle.

10. First, call on students to pantomime their feeding behavior for the other students and see if they can guess what animal is being imitated. If the others are unable to guess (two guesses), have the student read the description (allow students one more guess) and then tell the others his/her identity. Continue to call on other students until all identities have been discovered.

11. Discuss the results. Did every predator get at least 10 tokens? If not, why not? (Some animals are more selective feeders so may not find as much food as others.) What will happen to predators that did not get enough food? Do any prey items have empty envelopes? What does this mean? (This is one problem with many kinds of waterfowl that nest in wetlands. As wetlands are drained, birds are forced to nest in smaller areas. This makes them easy targets for predators.) Talk about the different ways animals are connected to each other.

    Discuss how **decomposers** break down the remains of plants and animals to form **detritus** which contains minerals and vitamins used by plants (**producers**) to make food using the sun's energy (**photosynthesis**). These plants are eaten by animals (**consumers**; **herbivores**) that become prey items for larger animals (**consumers**; **predators**).

12. Draw a **food web** based on the interactions of the game. With older students you might elaborate on the food web idea and include plants, herbivores, and decomposers.

13. Collect the envelopes and put the tokens back into the correct envelopes.

14. OPTIONAL: Shuffle the envelopes and redistribute. Replay the simulation and draw a second food web.

15. Summarize by reviewing some of the animals found in a marsh and their role in the marsh ecosystem. Reiterate the importance of marshes.

Extensions

1. Make several copies of the *Feeding Behavior Cards* used for the game. Have students get into groups and arrange cards to form food webs. Have them connect the cards by taping strands of yarn between them. See who can form the largest **correct** food web.

2. Give each student a different marsh animal (and/or plant) to research. Have them find out what it eats (animals) and what eats it. Use this information to make a large food web on the board. Replay the game, allowing predators to gather food tokens **only from prey items they normally would eat.** Discuss how becoming "specialized" affected their ability to gather enough food. (See the *Predator Diet Sheet.*)

Evaluation

See the student worksheets.

Student Materials

Student Worksheets Levels 1 & 2; Feeding Behavior Cards

Answers for Student Worksheets: Level 1) raccoon, dragonfly, pike, great blue heron, snapping turtle, bullfrog; Level 2 Matching: d, e, a, g, f, b, c; Multiple Choice: 1)producer 2)predator 3)prey 4)prey 5)predator 6)predator 7)prey 8)predator 9)prey 10)prey 11) predator 12)producer 13)prey

Teacher Aids
Audiovisual Program: Aquatic Life; Poster: Aquatic Life
CD: Biodiversity of Iowa: Aquatic Habitats

Additional Materials
Iowa Department of Natural Resources. The Prairie Marsh. (Slide/Tape)
MacGraw Hill. World In A Marsh. (16 mm, VHS)

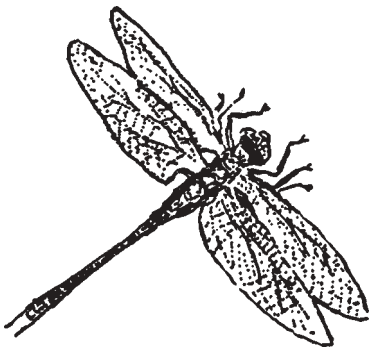
PREDATOR DIET SHEET

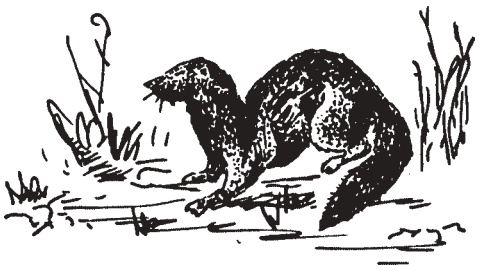
(Contributed by Diane Pixler)

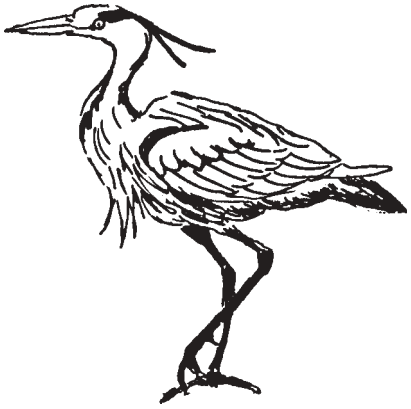
Following is a list of predators included in “Marsh Munchers.” Prey each might eat are listed.

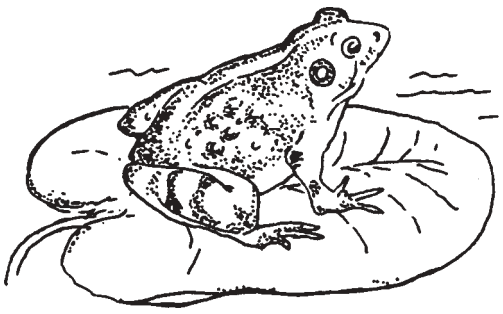
PREDATOR	PREY ITEMS
DRAGONFLY	scud, water flea
GREAT BLUE HERON	bullhead, crayfish
RACCOON	bullhead, snail, clam
SNAPPING TURTLE	bullhead, crayfish, painted turtle
MINK	bullhead, muskrat, clam, snail, crayfish
BULLFROG	scud, water flea, bullhead
NORTHERN PIKE	bullhead, painted turtle (some), muskrat (rarely)
NORTHERN WATER SNAKE	bullhead, crayfish

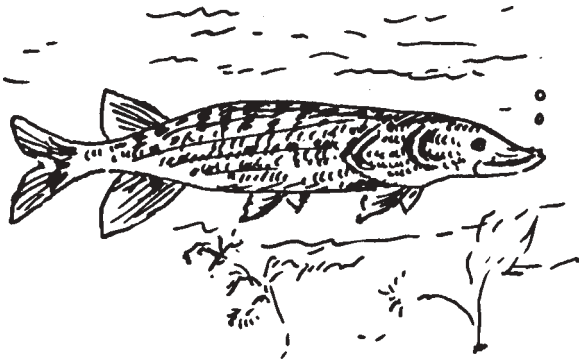
Marsh Munchers: Feeding Behavior Cards - Predators

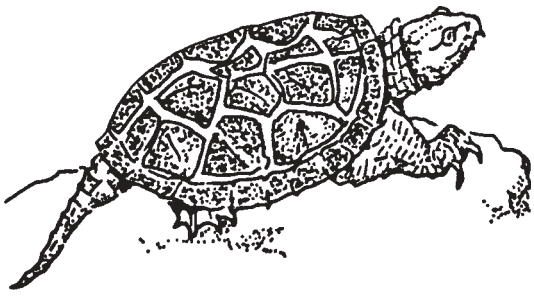


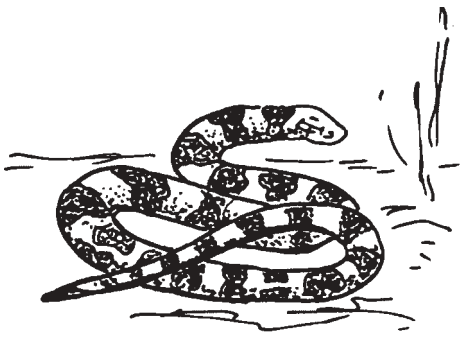






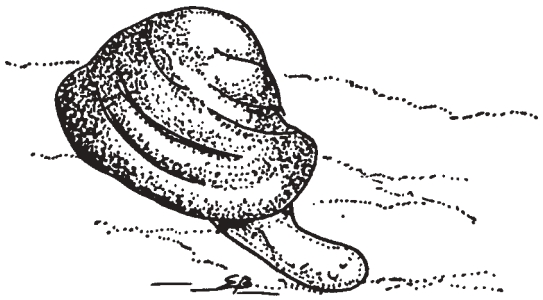


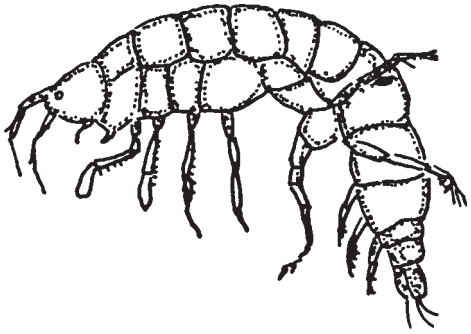


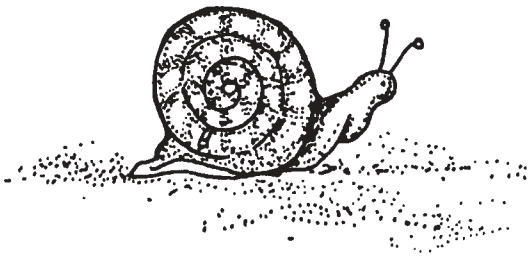


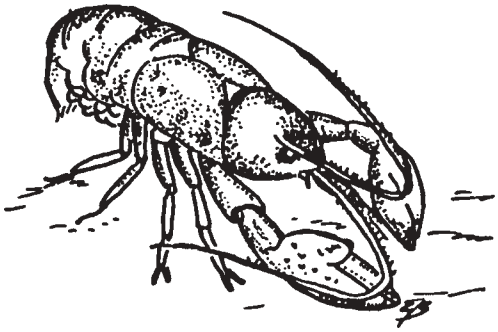
MINK The mink is a predator that eats fish, bird eggs, newly-hatched birds, and other small animals. **Behavior:** Crawl on your hands and knees and keep close to the ground. Mink are very good at sneaking through grasses and shrubs at the edge of the marsh.	**DRAGONFLY** The dragonfly is a predator. It eats smaller insects that it catches while flying by making a “basket” with its legs. **Behavior:** Put your arms out to the sides and “swoop” to catch insects.
BULLFROG The bullfrog is a predator that eats fish, salamanders, and other animals that are smaller than it. **Behavior:** Squat with your hands on the floor in front of you and leap like a frog.	**GREAT BLUE HERON** The great blue heron is a predator that eats fish in the shallow water. It grabs them with its spear shaped bill. **Behavior.** Walk, raising each leg up very high and putting it back down carefully (Don’t scare the fish!). Put your hands together in front of your mouth to make a spear-shaped bill.
NORTHERN PIKE The pike is a predator that eats smaller fish. **Behavior:** Put your hands in front of your mouth to make pike jaws and snap them shut. Very quickly take 3 or 4 steps and then stop. Repeat.	**RACCOON** The raccoon is a predator that eats fish, clams, and large insects. **Behavior:** Put your hands together in front of your chest and act like you are washing them. Walk with your head bent to look for food.
NORTHERN WATER SNAKE The northern water snake is a predator that eats mostly fish and frogs. **Behavior:** Crawl on your hands and knees weaving back and forth. Stop and put your hand in front of your mouth and make a “V” with your fingers. This is the snake’s tongue that it uses to smell food.	**SNAPPING TURTLE** The “snapper” is a predator that eats fish, frogs, and almost anything smaller than it is. It sits on the bottom of the marsh and “fishes” with a worm-like lure on its tongue. **Behavior:** Crawl on your hands and knees. “Snap” your head out of your shell to grab food.

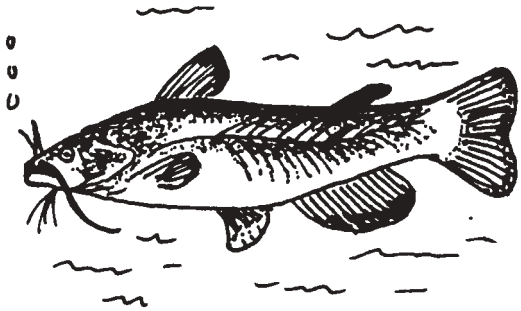
Marsh Munchers: Feeding Behavior Cards - Prey Items

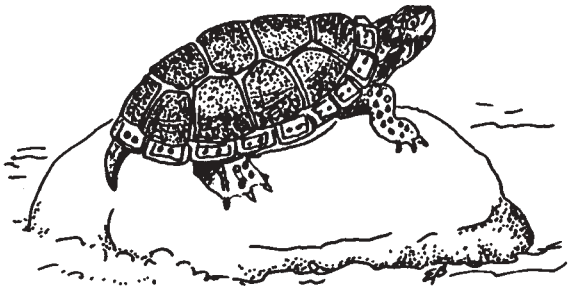












SCUD The scud is a scavenger. It eats tiny bits of rotting plants and animals. **Behavior:** Sit with your legs crossed. Spread your fingers out and move both hands to your mouth like you are putting food in it.	**FRESHWATER MUSSEL** The mussel filters tiny bits of food from the water as it moves over the clam's gills. Tiny "hairs" on the gills move back and forth to carry the food to the mussel's mouth. **Behavior:** Sit with one leg out (This is the mussel's foot.) and cup your hands around your mouth to make the tube that pulls water into the mussel's gills.
WATER FLEA The water flea eats plankton—very tiny plants and animals. **Behavior:** Sit with your hands over your head and move them back and forth. They are the antennae the water flea uses to taste its food.	**POND SNAIL** The snail has a very rough tongue that it uses to scrape plants. **Behavior** Sit with one hand out and move it in circles like the snail's tongue.
JUVENILE BULLHEAD The bullhead is a scavenger. Young bullheads eat tiny plants and animals. **Behavior:** Lay on your belly. Put your hands under your chin with your fingers out. These are the "whiskers" bullheads use to taste their food.	**CRAYFISH** The crayfish is a scavenger that eats almost anything. **Behavior** Sit with your hands in front of you. Hold your hands like crayfish claws and move them around.
MUSKRAT This rat-like animal uses cattails for food and to build its "house" as well. **Behavior:** Sit and act as if you are holding a cattail. Pretend to chew on your imaginary cattail.	**PANTED TURTLE** The painted turtle eats mostly plants. **Behavior:** Lay on your belly and use your arms to raise yourself. Hold your head off the floor and move it back and forth.

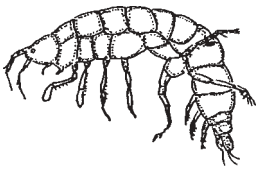
Marsh Munchers: Student Worksheet Level 1

DIRECTIONS: Circle the marsh animals that are predators (eat other animals).

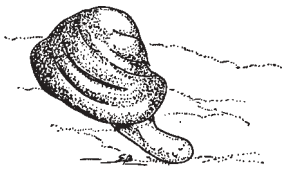
raccoon

snail

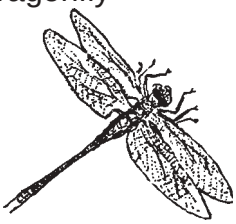
scud



mussel

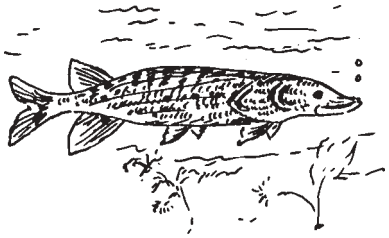


dragonfly

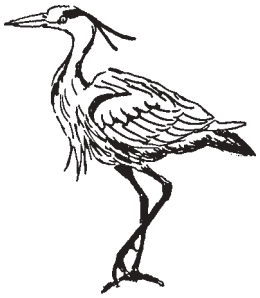


water flea

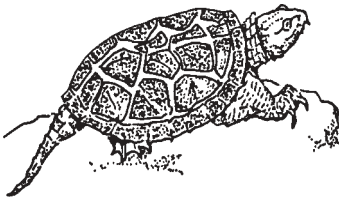
northern pike



great blue heron



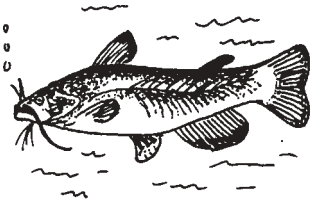
snapping turtle



bullfrog

muskrat

juvenile bullhead



Marsh Munchers: Student Worksheet Level 2

MATCHING

Place the letter of the correct word in the space next to the definition.

a. consumer	_____	1.	any living thing
b. decomposer	_____	2.	animal that eats other animals
c. food chain	_____	3.	any animal is called this because it can't make its own food
d. organism	_____	4.	green plant
e. predator	_____	5.	animal that is eaten by another
f. prey	_____	6.	tiny bacteria that cause dead plants and animals to "rot"
g. producer	_____	7.	one example is: algae–juvenile bullhead–water snake

MULTIPLE CHOICE

Identify the organisms listed below as predators, prey, or producers by circling the correct response.

1.	algae	predator	prey	producer
2.	bullfrog	predator	prey	producer
3.	muskrat	predator	prey	producer
4.	freshwater clam	predator	prey	producer
5.	northern pike	predator	prey	producer
6.	northern water snake	predator	prey	producer
7.	scud	predator	prey	producer
8.	mink	predator	prey	producer
9.	juvenile bullhead	predator	prey	producer
10.	pond snail	predator	prey	producer
11.	raccoon	predator	prey	producer
12.	cattail	predator	prey	producer
13.	painted turtle	predator	prey	producer

Using the organisms listed above, make at least three different food chains.