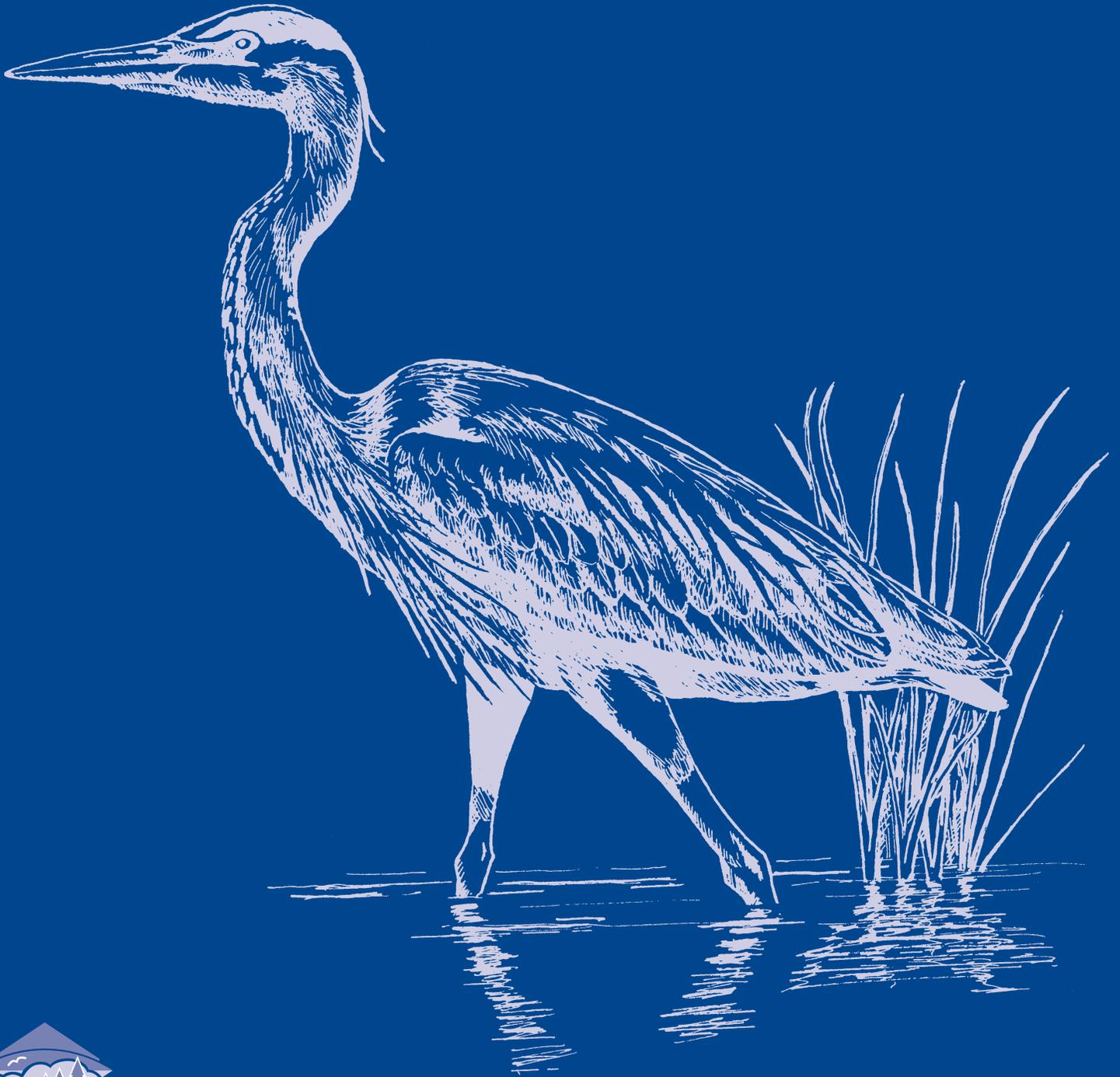


ALBERTA ENVIRONMENT

Pond Pals



Alberta
ENVIRONMENT

Kananaskis Country

This publication is part of a series of field study programs produced by the Environmental Education Program of Natural Resources Service in Kananaskis Country and Fish Creek Provincial Park. The publications have been written to address the mission of Alberta Environment and increase students' environmental awareness, understanding, interaction and responsibility for the natural world in which they live.

The publications are developed in a close working relationship with teachers, community educators and program writers. Programs focus on the areas of environmental education, science, social studies and language arts. They are also developed to emphasize elements of environmental literacy, lifestyle, and citizenship.

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Pond Pals

ISBN: 0-7785-0868-4 Pub. No.:I/775 (printed edition)
ISBN: 0-7785-0869-2 Pub. No.:I/775 (on-line edition)

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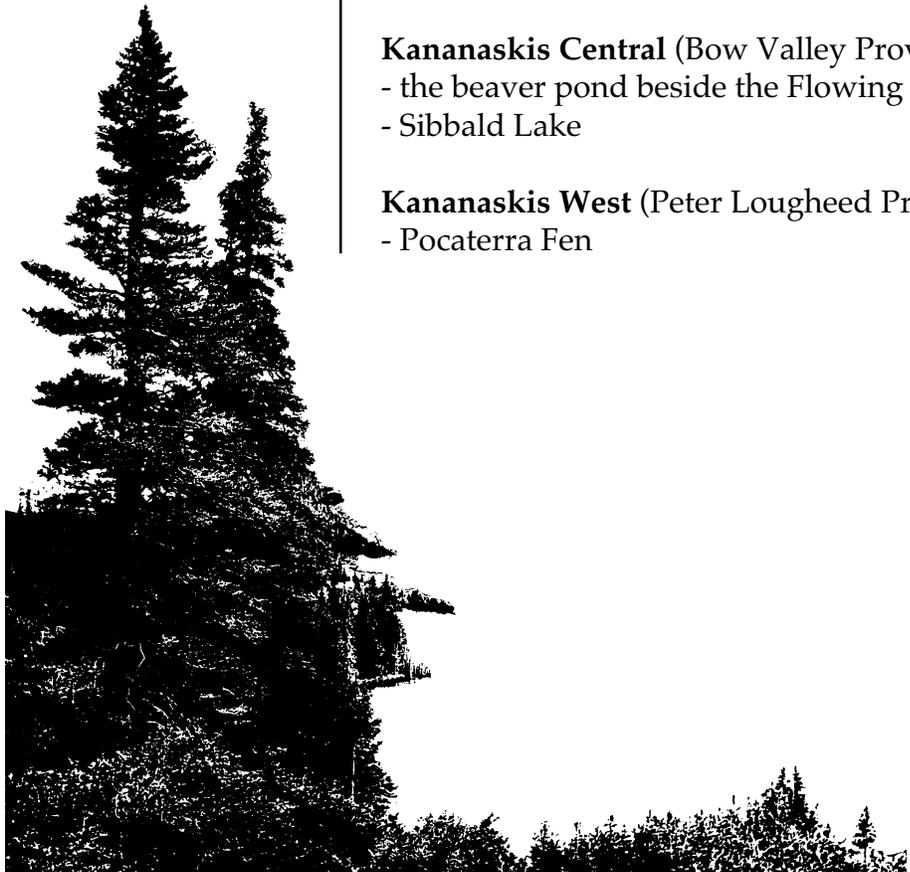
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April, 1991

1.0 OVERVIEW

1.1 AT A GLANCE

TOPIC	Meeting Basic Needs Pond Communities Interrelationships
PROGRAM LEVEL	Grades 1 - 3 / Ages 6 - 8
TIME REQUIRED	- Pre-Field Study Activity: 60 minutes - Field Study: 2 hours - Post-Field Study Activities: a selection of 8 one hour activities
STAFF REQUIRED	One teacher with parent volunteers Recommended ratio 1 adult: 5 students
BEST SEASON	Spring or fall
SUGGESTED LOCATIONS	Kananaskis East (Elbow District) - McLean Pond Kananaskis Central (Bow Valley Provincial Park) - the beaver pond beside the Flowing Waters Trail - Sibbald Lake Kananaskis West (Peter Lougheed Provincial Park) - Pocaterra Fen



1.2 PROGRAM SUMMARY

The *Pond Pals* field study is designed to encourage students to explore a pond community and find out how the different plants and animals meet their basic needs in this community. A pre-field study activity introduces students to the needs of plants and animals living in a pond community.

A Student Booklet has been written to guide students in a variety of on-site activities pertaining to the basic needs of plants and animals living in a pond. Through observations made during the field study, students will become aware of the similarities and differences between their community and a pond community. A Volunteer Booklet has also been provided to assist volunteers in directing the students' discoveries. With little preparation, volunteers will be able to assist the students and teacher in conducting the activities.

After the field study, teachers can select activities from the post-field study section to reinforce concepts learned during the field study.

Throughout the program, space has been set aside under the heading **Teacher's Notes** for you to add your own thoughts, ideas, and variations for the activities.

This program is part of a written unit for Division I on needs, families, and communities. Each program can be used separately or as a unit of study. The complete unit includes:

Welcome to My Home - a field study designed to encourage students to discover how beavers meet their needs within the environment. This field study offers an excellent introduction to the story *Living and Loving the Life of a Beaver*.

Living and Loving the Life of a Beaver - a story and activity guide about two children who go on a field study to a beaver pond. While there, they meet a beaver who shrinks them in size, and takes them on a trip. During the trip, the children discover what beavers eat, where they sleep, what their family lives are like and who their enemies are. Activities related to the topics covered in each chapter are included. This story offers background to the field study you are currently reading.

1.3 PROGRAM OBJECTIVES

All of the following objectives need not be met. Teachers can select certain objectives which can be emphasized during the program. Students will have the opportunity to:

1. Gain an awareness of the natural environment through experiential exploration and learning.
2. Understand that plants and animals are distinct and have different characteristics.
3. Understand that all living things have basic needs: food, water, shelter, and space.
4. Understand that animals rely on plants for food.
5. Understand the concept of predation.
6. Use words and designs to understand and describe the environment.
7. Develop an awareness and sensitivity toward the environment and begin to recognize interrelationships.

1.4 CURRICULUM TIE-INS

This program supports selected themes and objectives outlined in the Alberta Curriculum for Division I Science. Selected themes and objectives are covered using the natural environment as the focus. Such a focus allows students, at their own level to explore the concept that they are **a part of** rather than **apart from** the world in which they live.

Curriculum tie-ins are indicated in each activity. In general, the following areas are addressed:

DIVISION	SUBJECT	SUBJECT MATTER
One	Science	Living Things and Environment - Living Things - Plants and Animals Matter and Energy - Properties of Objects

2.0 PRE-FIELD STUDY

2.1 MAKING A POND

All plants and animals need food, water, shelter, and space. A community is a particular place where all the needs of the plants and animals living there are met. This activity will prepare the students for their field study by introducing them to the basic needs of plants and animals in a pond community.

Objectives

Students will understand the concept of basic needs.

Students will be introduced to the concept of communities.

Curriculum Tie-in

Science: Living Things and Environment - Plants and Animals

Plants and animals are living organisms. Each has its specific characteristics and particular needs to sustain life.

Time Required

60 minutes

Materials

- 1 bulletin board
- enough newsprint to cover the bulletin board
- blue cellophane or blue construction paper to make a pond on the bulletin board
- 1 set of *Pond Pals Bulletin Board Plants and Animals* handouts (see pages 7 - 11)

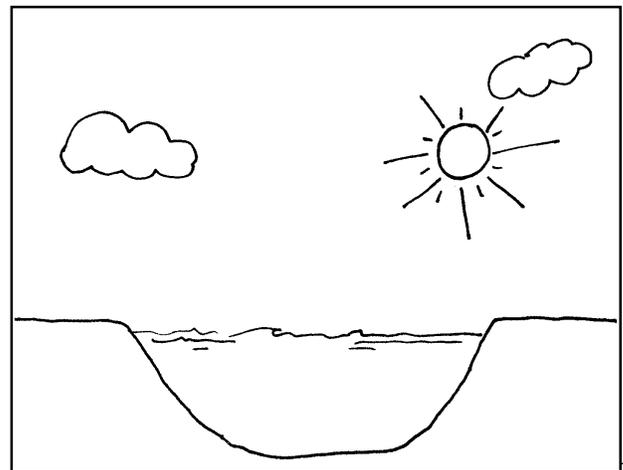
Instructions for the Teacher

1. Make enough copies of the *Pond Pals Bulletin Board Plants and Animals* handouts to allow each student to have a picture of at least one plant and one animal.
2. Define the word community and the idea of basic needs for the students.
community: Where plants and animals live together in a certain place and do something to one another (interact).
basic needs: There are four basic needs all living things require for survival: food, water, shelter, and space.

3. Ask students the following questions:
 - Do they think the place where they live is a community? What makes it a community?
 - Can they think of a way in which they do things for other people or other people do things for them, i.e. interact? (*Students may mention buying groceries, leaving garbage for the garbage men or other ways they interact with people during the day.*)
 - How do the students meet their basic needs in the community?
4. Write the following chart on the chalkboard and have students list how they meet their needs.

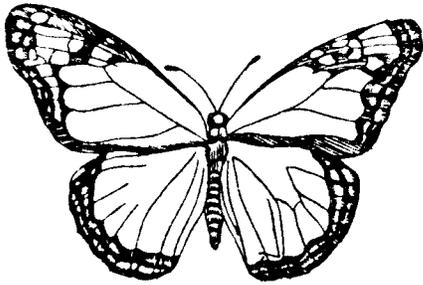
MY COMMUNITY	
BASIC NEED	HOW NEED IS MET
FOOD	<i>(e.g. grocery store, gardens)</i>
WATER	<i>(e.g. tap, river)</i>
SHELTER	<i>(e.g. house, apartment, school)</i>
SPACE	<i>(e.g. backyard, parks)</i>

5. After completing the chart on their own community and basic needs, hand out one or more of the ***Pond Pals Bulletin Board Plants and Animals*** pictures to each student. The students will now build a natural community.
6. Have the students cut out and colour their plant and animal pictures. Explain to the students that they are going to make a pond community on the bulletin board using their cut-out plants and animals.
7. To make the bulletin board pond, cover the bulletin board with brown construction paper. Add blue construction paper in the shape of a pond (see diagram). The whole “pond” should be approximately 1 m x 1 m in size.

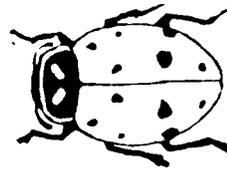


8. Have each student place their plant or animal on the bulletin board in the place where it lives or can be found (for example, a dragonfly could be in the air above the pond or resting on a cattail).
9. If a student is unsure of where their plant or animal lives, set it aside until after the field study when students will have a better idea where the plant or animal lives.
10. Add clouds, trees, and a sun to complete the scene.
11. When all the students have placed their plants and animals on the bulletin board, ask them the following questions:
 - What makes the pond a community? (*Plants and animals living together in a certain place, meeting their needs and interacting, or doing something to each other.*)
 - Name a plant or animal that interacts with another plant or animal? (*The duck eats weeds or insects. The frog eats mosquitos. Fish eat snails and shrimp. Ducks make nests in tall weeds at the edge of the pond.*)
 - How can a fish meet its basic needs at the pond?
 - Food - fish may eat other small fish, insects, snails, algae, and plants in the pond*
 - Water - fish get their water from the food they eat*
 - Shelter - fish may find shelter in weeds, under logs or in a deep part of the pond*
 - Space - fish find space in the pond, the larger the pond the more space a fish would have*

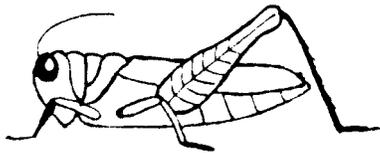
POND PALS BULLETIN BOARD PLANTS AND ANIMALS



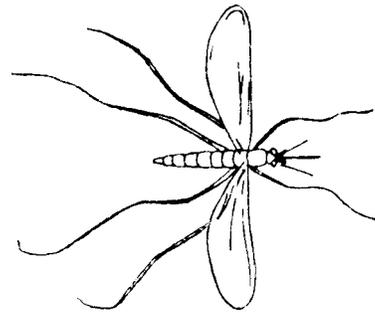
butterfly



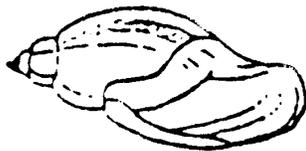
beetle



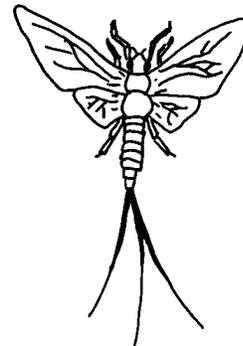
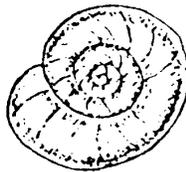
grasshopper



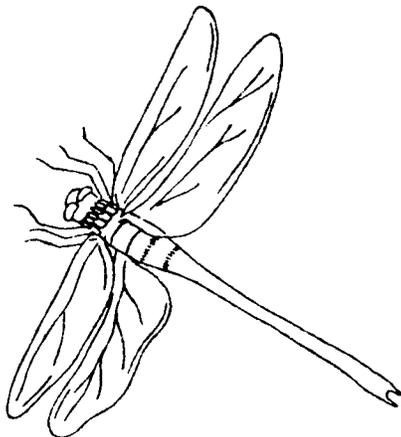
mosquito



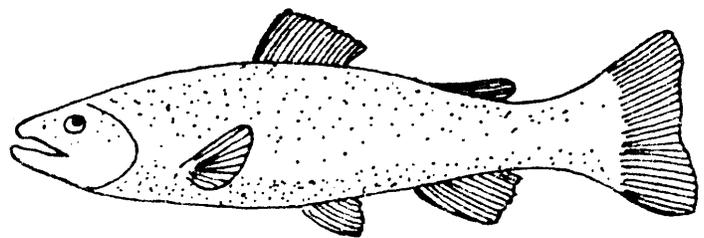
snails



mayfly

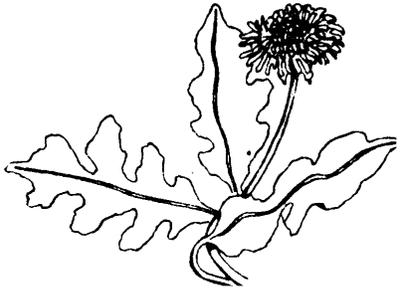


dragonfly



fish

POND PALS BULLETIN BOARD PLANTS AND ANIMALS



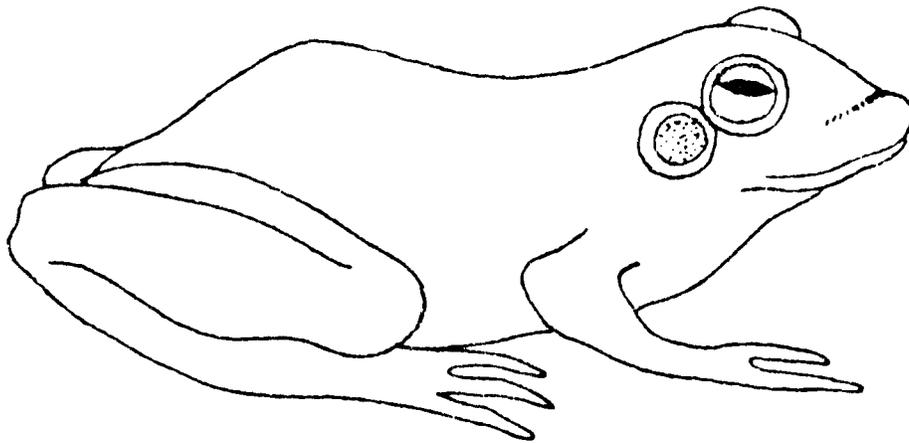
dandelion



caddisfly

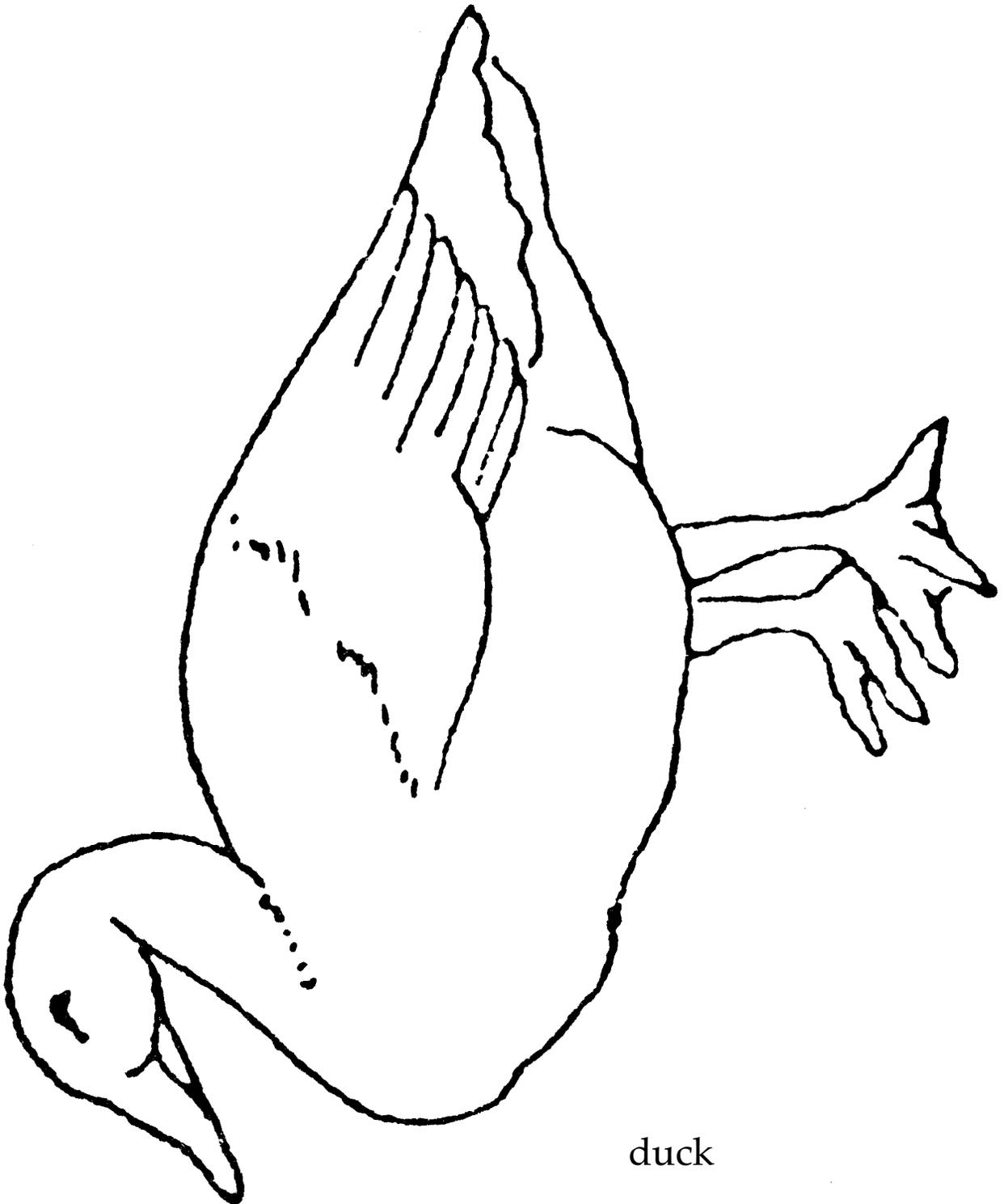


stonefly



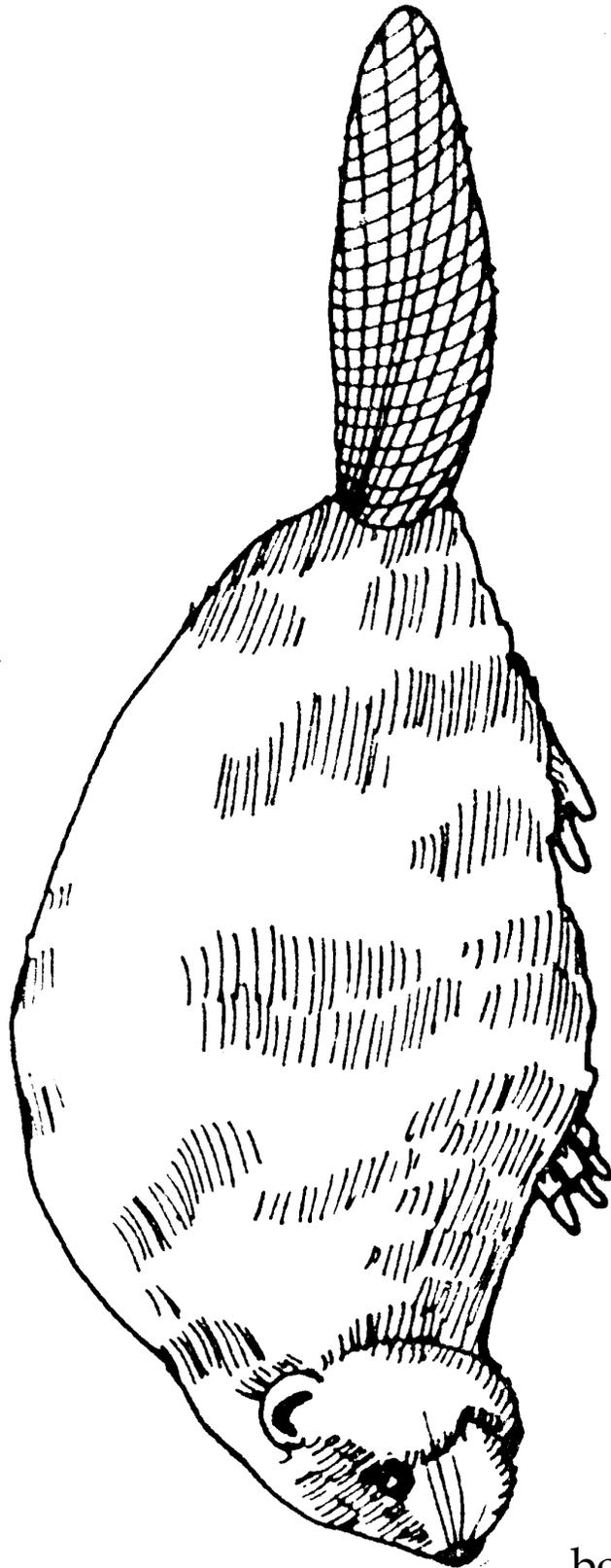
frog

POND PALS BULLETIN BOARD
PLANTS AND ANIMALS



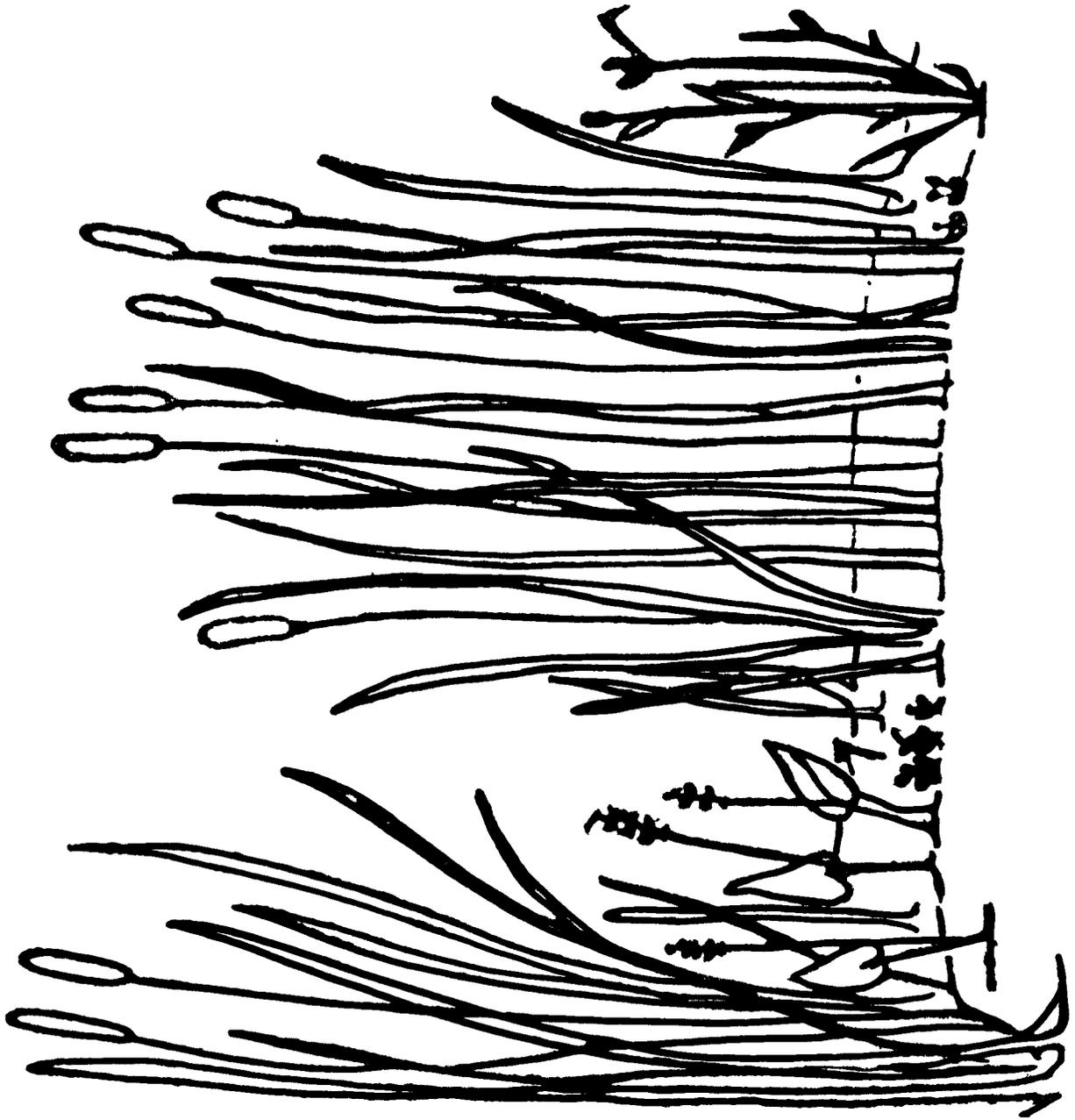
duck

POND PALS BULLETIN BOARD PLANTS AND ANIMALS



beaver

POND PALS BULLETIN BOARD
PLANTS AND ANIMALS



cattails

3.0 FIELD STUDY

The field study will give students the opportunity to discover how the plants and animals in a pond meet their needs.

Objectives

Students will gain an awareness of the natural environment through experiential exploration and learning.

Students will understand that all living things have basic needs: food, water, shelter, and space.

Students will develop an awareness and sensitivity toward the environment, and begin to recognize interrelationships.

Curriculum Tie-ins

Science: Living Things and the Environment - Plants and Animals

Plants and animals are living organisms. Each has its specific characteristics and particular needs to sustain life.

Living Things

All those things which require food and water and grow and reproduce are classified as living.

Matter and Energy - Properties of Objects

Objects can be identified, grouped, and ordered on the basis of physical properties.

Materials

A **Pond Exploration Kit** for each group of 5 students containing:

- 5 *Pond Pals* Student Booklets (see Appendix V).
- 5 clipboards. These clipboards can be made from 22 cm x 30 cm pieces of cardboard with 2 strong elastic bands wrapped around each one. The elastic bands help to keep the booklets in place on the clipboard.
- 5 pencils.
- 5 pieces of string 1 metre long. Tie the ends of the string together and tie or tape the pencil to the string. The students can wear their pencils around their necks.
- 1 white plastic dishpan or white plastic container.
- 5 hand lenses.
- 2 dip nets (see Appendix II for instructions).
- 5 spoons for digging in the mud.
- 1 Field Guide to Pond Life in Kananaskis Country (see Appendix III).
- 1 bag to hold the group's materials.

For Each Volunteer

- 1 Volunteer Letter (see sample in Appendix I).
- 1 *Pond Pals* Volunteer Booklet (see Appendix IV).

For the Teacher

- 1 *Pond Pals* Volunteer Booklet (see Appendix IV).
- 1 whistle.
- 1 microscope (optional).
- 1 camera and film for recording your outing (optional).

Instructions for the Teacher Before the Field Study

1. Choose a pond or slow-moving stream for the field study. Visit the site before the day of your class's arrival to become familiar with its facilities, features, and hazards.
2. Arrange for program assistance by enlisting the help of parents, school volunteers, or high school students. This program is designed for small groups. A ratio of 1 volunteer to 5 students is recommended. It is also recommended that the teacher be free to circulate among the groups and provide assistance when needed. The volunteers' roles are to keep their groups on task, to direct questioning, and to offer assistance when needed.
3. Each volunteer should receive a Volunteer Letter and a copy of the *Pond Pals* Volunteer Booklet at least two weeks prior to the field study to allow time for review and program familiarization.
4. One to two weeks before the day of the field study, send a letter and consent form to the student's parents. Students will need a warm, waterproof jacket, a hat, and a packed lunch or snack. It is recommended that the teacher bring some extra clothes in the event that someone falls in the water.
5. Collect the materials listed in the Materials section for each group's pond exploration kit.
6. Before the field study, build the dip nets. The purpose of the dip net is to collect small organisms from the bottom of the pond or from among the plants living in the pond. You may wish to give students the opportunity to practise using the dip nets by having them scoop small pieces of paper out of a sink or basin. Show students how to get the animals they collected out of the net and into the dishpan. First, fill the dishpan with water. Then place the net into the tray, turn the net inside out and gently swish it in the water. After observing the animals in the dishpan, students should let them go in the pond. To do this, submerge the dishpan in the pond and gently tip the water out of it. Never pour the water out of the dishpan into the pond. Such action could prove fatal to the small plants and animals in the pond water.

7. Give the students the opportunity to become familiar with the hand lenses.
8. Divide the students into groups of 5, and assign a volunteer to each group. Place each group's exploration kit into a bag. Label the bags with the names of the students in the group and the name of the adult volunteer.

Teacher's Notes

Instructions for the Teacher During the Field Study

1. Before departing on your field study, meet with volunteers to answer any questions they may have about the field study and the Volunteer Booklets. Remind volunteers that the instructions in their booklets are designed to help them direct students' discoveries.
2. At the site, assemble your class in an open area. Establish boundaries for the activities. These boundaries could be delineated by pathways, distinctive trees, or creeks. You can also establish a boundary by telling students to always be where they can see their volunteer and their volunteer can see them.

NOTE TO TEACHER: In Provincial Parks and Recreation Areas, plants and animals are protected. Please encourage the students to look, touch, smell, and feel, but always to leave things as they found them. No picking or collecting, except for the pond animals which should be gently returned to where they were found.

3. Introduce the field study by reviewing the four basic needs: food, water, shelter, and space. Ask the students if they can remember the plants and animals they put onto their bulletin board pond. Tell them that all those plants and animals have the same needs, but that each one meets its needs in a different way. They are now going to find some of those pond plants and animals, and discover how they meet their needs.
4. Review the use of the dip nets, the hand lenses, and the care of pond animals and plants.
5. Divide the students into their groups of five with their volunteer. Each volunteer will receive the group's exploration kit. Each student should be handed a *Pond Pals* Student Booklet, a clipboard, a pencil and string, a hand lens, and a spoon from the group's exploration kit. Explain to the students that they will now spend time in their exploration groups. Establish a time and place to meet at the end of the exploration. You may wish to blow a whistle to call the groups back.

6. Send the groups out to do the activities in their booklets. The groups should spread themselves out along the pond shoreline so that they all have room to work independently. Have the students record the information they collect in their booklets. If the students are not yet able to read and write, have the volunteers read the questions out loud and have the students discuss their answers.
7. Once the groups have dispersed, the teacher's role is to circulate, answer questions, and be an interested observer.

Conclusion

8. The conclusion will provide students with the opportunity to share what they have discovered about pond plants and animals with their classmates and volunteer leaders.
When the students have completed the activities in their booklets, gather the groups together in one circle.
9. Have the students take turns sharing one thing they learned about pond plants and animals. If there is time, you may wish to ask the students the following questions and discuss their answers.
 - Who are some of the pond pals you met?
 - What do the pond pals eat?
 - Where do they live? (*in the pond, at the edge of the pond or in the air above the pond*)
 - Who is your favourite pond pal? Why?
 - What pond sounds did you hear?
 - What other sounds did you hear?

Teacher's Notes

4.0 POST-FIELD STUDY ACTIVITIES

The following activities will give the students the opportunity to further explore the knowledge they gained during their visit to the pond.

POND PALS REVIEW

1. If possible, play a tape of common pond sounds. Make a list of all the pond sounds from the tape and from the drawings made by the students in the *Pond Pals* Booklet. Talk about the sounds that belong at the pond, and the sounds that belong to the surrounding areas such as highway noises, city noises, and human noises.
2. What living things did students find that were shorter than 5 centimetres? Longer than 10 centimetres? If students made drawings, have them colour the pictures and place them on a bulletin board in the classroom.
3. In activity 2.1 *Making a Pond*, students may not have been sure where to put their plant or animal. After the field study, students should have a better idea of where organisms live in a pond. Have them place the picture of their plant or animal in the appropriate place on the bulletin board pond.
4. Cut out the pictures of pond animals found on page 7 of their *Pond Pals* Booklet. Place them around the room for everyone to see. Try to guess the name of the animal, then get a Pond Guide from the library and look for the animals. Have a science teacher come to class and identify the animals and talk about pond life.

POND DISCOVERIES

Record students' information about the pond on a chart. List each student's name down the left-hand side of the chalkboard or on a large piece of paper. List the subject across the top (Animals, Plants, Sounds, etc.). Draw what each student found during the field study under the appropriate heading. For example:

STUDENT'S NAME	PLANTS	ANIMALS	SOUNDS
Barry			
Sarah			
Terry			

PICTURE CHART

Another way of recording which plants and animals were seen by which students is to make a picture chart. Glue the Pond Pals Bulletin Board cutouts onto poster board. Place the pictures down the left column. Beside each picture, record the names of the students who found that particular plant or animal. For example:

WHAT WE FOUND AT THE POND	
POND PALS (Plant / Animal)	FOUND BY:
	Ian, Susan, Karen, Mary
	Debbie, Joel, Bob, Ruth
	Gareth, Bob

PHOTO ALBUM

If you took pictures during your field study, put them together in a photo album or as a collage.

POND PUPPETS

Make paper plate pond puppets using the directions found on page 19. Change the frog to a fish by omitting the tongue and adding a fin to the top.

POND MAZE

Make a copy of the *Pond Maze* found on page 20 for each student. Have students complete the maze. Talk about the pond life in the maze.

MAKING A POND

Make copies of the handouts *Making a Pond* and *Plants and Animals for Making a Pond* for each student (see pages 21 and 22).

Have each student cut-out and colour the illustrations on their *Plants and Animals for Making a Pond* handout. Have them make their own pond by gluing the cut-out plants and animals to the blank pond picture. Students could take the pond pictures home and tell their parents about the pond field study.

POND WEB GAME

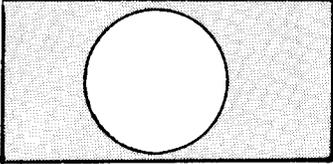
1. Write the names or paste pictures of the different pond plants and animals onto recipe cards. Make up extra cards for sun, water, air, and soil. Design one card for each student in the class.
2. You may wish to duplicate some of the names or divide the class into two groups of fifteen students and have each group do the activity on their own. Pin the cards to the students' shirts and have the group stand in a circle.
3. Hand a ball of wool or string to one student. That student should wrap the string around their hand and throw the ball to another plant or animal in the group that they depend on or who depends on them (i.e. a plant or animal they eat or need or that eats or needs them).
4. The ball is passed around among the students until everyone is linked to at least two other students.
5. Discuss the fact that the students have just created a food web which shows how all the plants and animals in the pond community are linked together. Have the person who is water let go of the string. The web will immediately start to fall apart. Explain that as the water in a pond dries up or is drained away, the web starts to fall apart and plants and animals die. It is important that all of the parts of the web stay together because the disappearance of one thing, such as water, will affect all the others.
6. The web of wool or string will reinforce the concept of community as a place where plants and animals live together, meet their needs, and interact with one another and with sun, water, and air.

POND PUPPETS

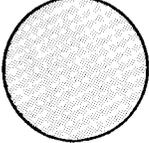
Materials

- construction paper
- stapler or glue
- scissors
- paint and paintbrushes

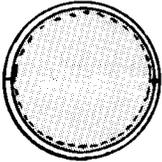
Instructions



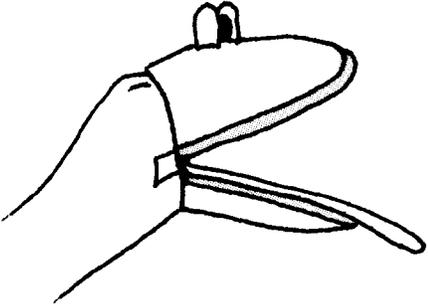
Step 1: Place the pie plate on the construction paper. Draw a circle around the edge of the plate onto the paper.



Step 2: Cut out the circle.



Step 3: Cut the pie plate in half and staple the circle of paper onto the bottom of the plate. Insert the staples around the edge of the plate leaving space for the hand.

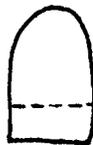


Step 4: Fold the paper in half to form the mouth of the puppet.

The puppet can be painted and left to dry. Add eyes and a tongue when it has dried.

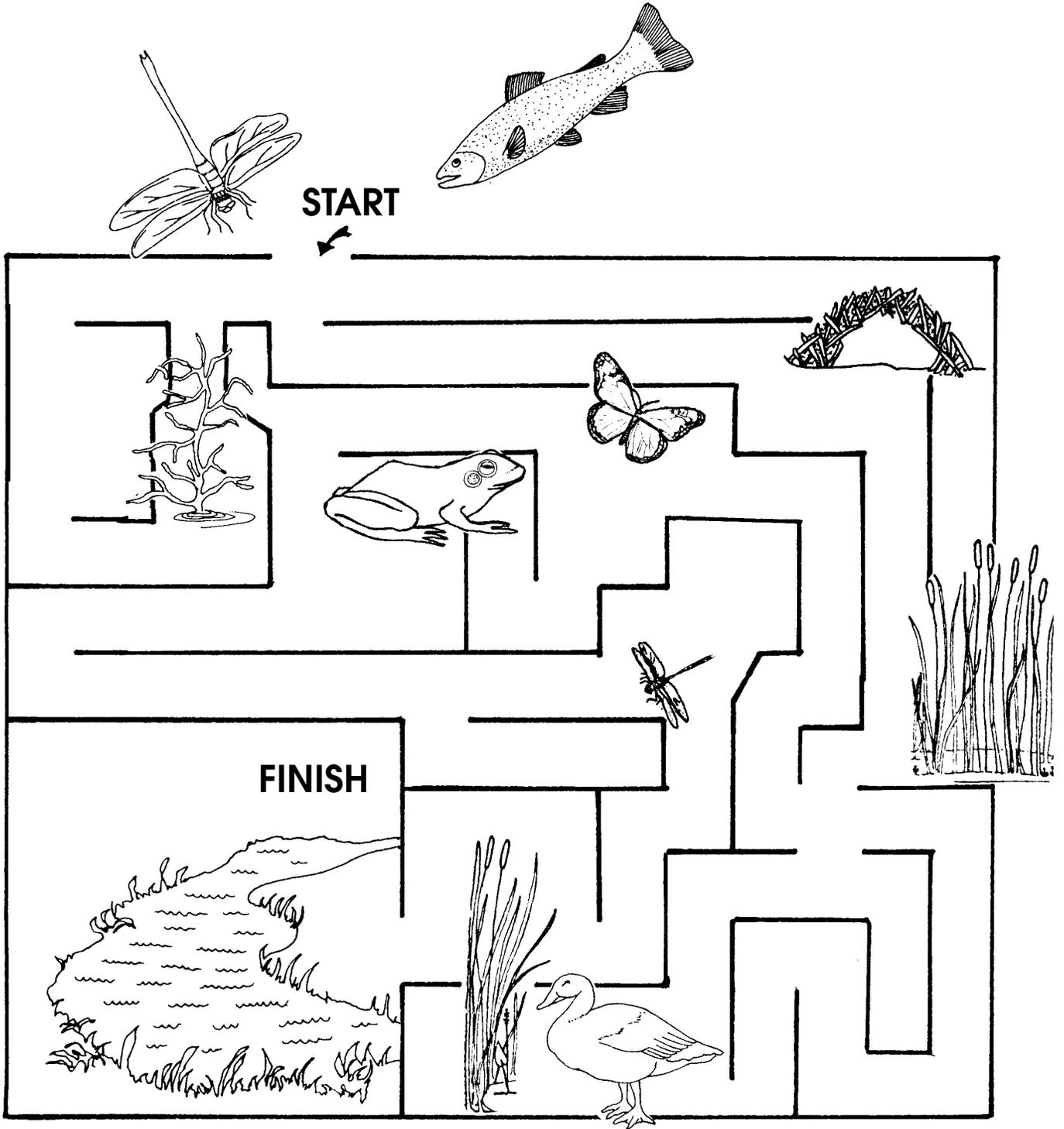
To make a frog tongue, cut a long strip of paper and glue it to the inside back of the mouth. Cut out nostrils and eyes and glue them to the face.

To make eyes, cut out this shape, fold on the dotted line and glue or staple to the head.

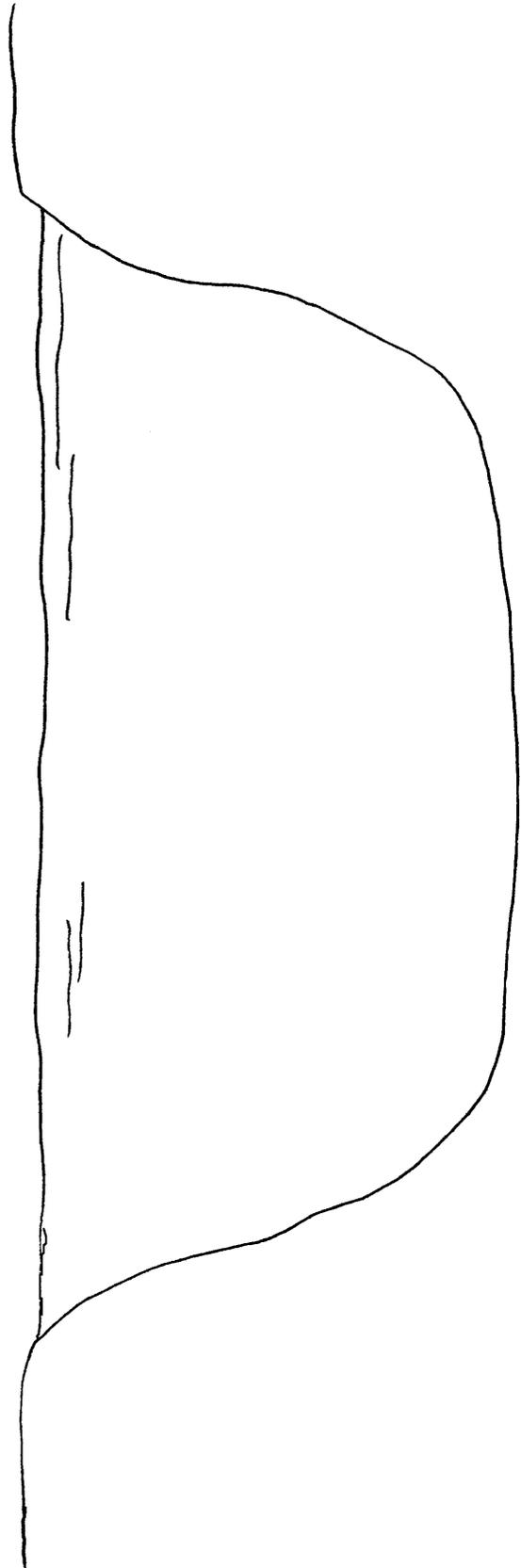
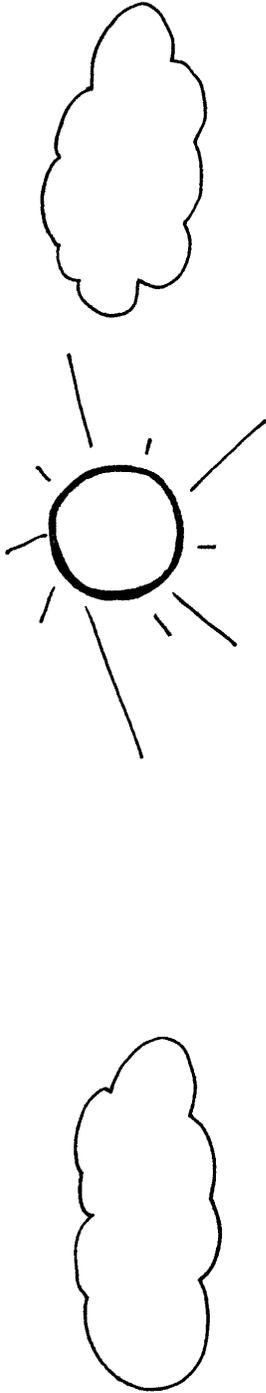


POND MAZE

Help the fish find the pond. The fish will pass other pond pals and their homes on his trip.

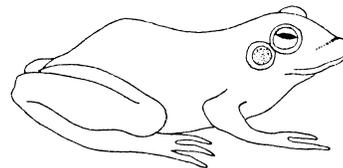
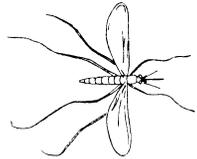
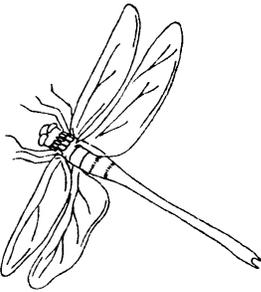
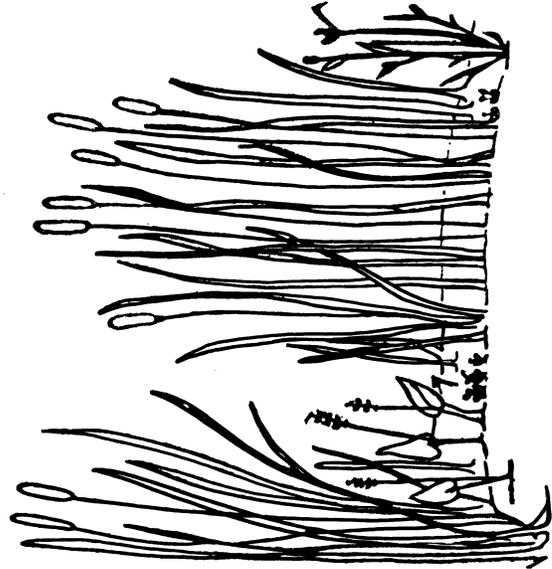
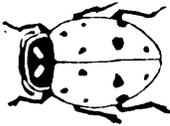
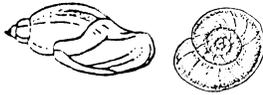
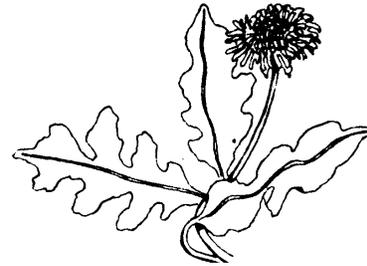
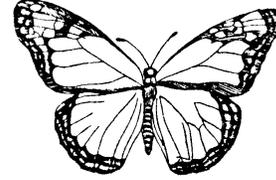
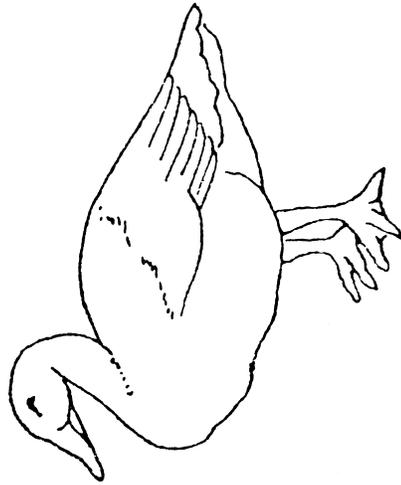
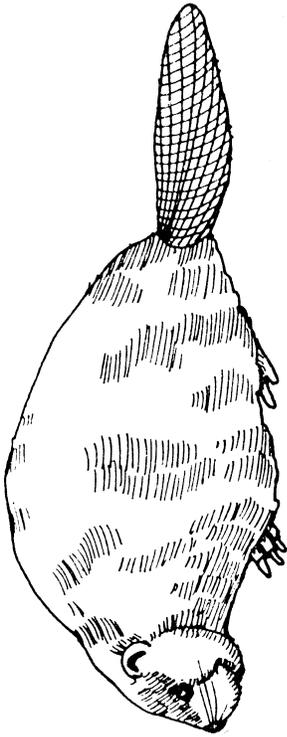


MAKING A POND



PLANTS AND ANIMALS FOR MAKING A POND

(not drawn to scale)



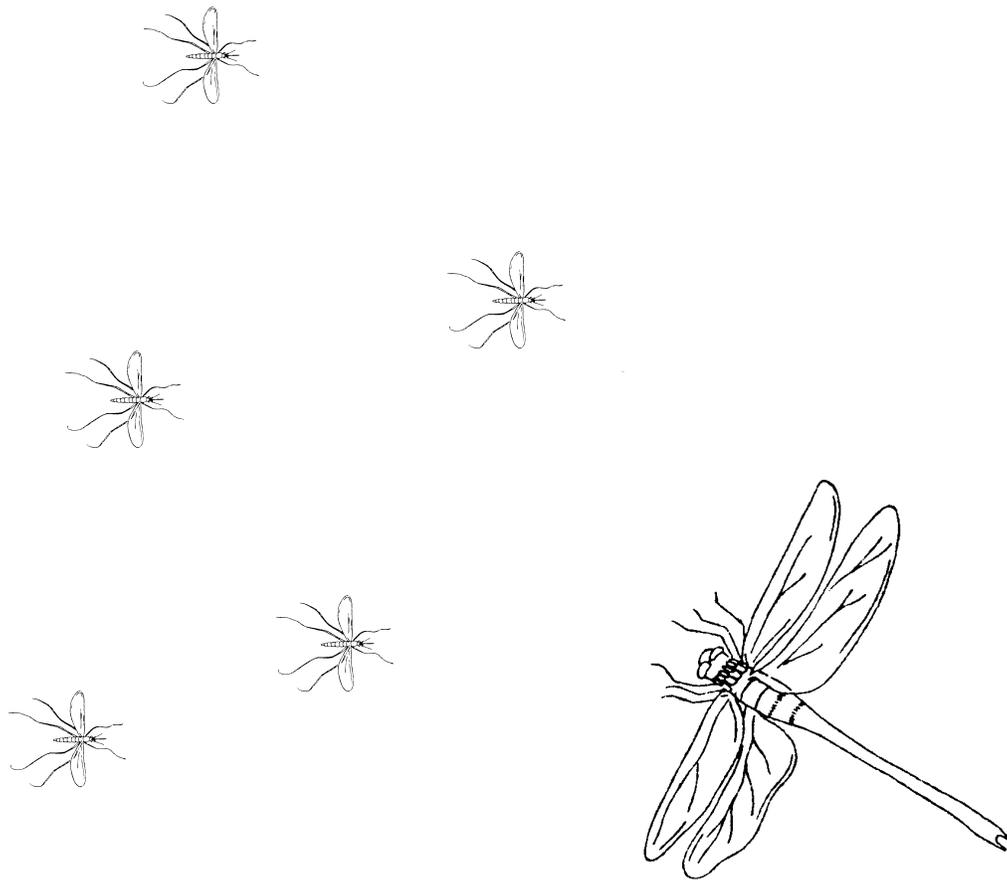
5.0 REFERENCES AND FURTHER READING

Caduto, M.J. Pond and Brook: A Guide to Nature Study in Freshwater Environments. Englewood Cliffs, N.J.: Prentice Hall, 1985.

Reid, George K. Pond Life (A Golden Nature Guide). New York: Webster Publishing Company, Inc. 1967.

Suzuki, David and Barbara Hehner. Looking at Insects. Toronto: Stoddart Publishing Company Ltd., 1986.

Zim, Herbert S. and Clarence Cottam. Insects (A Golden Nature Guide). New York: Western Publishing Company, Inc., 1951.



6.0 POND PALS PROGRAM EVALUATION

Kananaskis Country Environmental Education materials have been developed to provide you with teacher-directed units of study. These are *living documents* that undergo changes on a continual basis.

The purpose of this questionnaire is to find out if these materials are meeting your teaching needs. Your comments are valuable to us. Please take a few minutes to complete this evaluation so that we may continue to improve your materials.

School name	Grade level taught	Your name <small>(optional)</small>

- ★ How did you hear about the program?
 workshop administration in-service newsletter fellow teacher
 other (please specify) _____

- ★ Did you use all of the program? yes no
 If you answered **no**, which part did you **not** use and why?

- ★ On the bar line below how would you rate the program in the following categories:

	YES		NO
• appropriate for grade level (✓)			
• clear instructions			
• text easy to follow			
• relevant to curriculum			
• materials easy to use			
• did you enjoy the material			
• did your students like the material			
• program of appropriate length			

- ★ Approximately how long did it take you to complete these materials?
 1-2 weeks 3-4 weeks 5-6 weeks longer than one month
 program was spread over the year

- ★ Were you satisfied with how these materials fulfilled the curriculum objectives?
 yes no

If you **were not** satisfied, please elaborate: _____

- ★ Did you require any additional information to complete any part of the program?
 yes no

If **yes** please tell us what was required:

- ★ Would you use these materials next year?
 yes no

If you answered **no** please tell us why: _____

- ★ Any additional comments about the program in general? _____

Thank you for completing this questionnaire. Please place the completed questionnaire in an envelope and mail to:

**Environmental Education Coordinator
Alberta Environment, Natural Resources Service
Kananaskis Country
Suite 201 - Provincial Building
800 Railway Avenue
Canmore, AB T1W 1P1**

Phone: 403-678-5508 Fax: 403-678-5505

APPENDICES

- I VOLUNTEER LETTER
- II HOW TO MAKE A DIP NET
- III A FIELD GUIDE TO THE POND LIFE OF KANANASKIS COUNTRY
- IV *POND PALS* VOLUNTEER BOOKLET
- V *POND PALS* STUDENT BOOKLET

APPENDIX I: VOLUNTEER LETTER

Date

Dear

On _____, 19__ you will have the special opportunity to share with children the excitement and the wonder of investigating the natural environment by experiencing it with them, listening to them, and talking with them about what they observe and what they think about the world in which they live.

The activities which the children will be doing are outlined in the enclosed Volunteer Booklet. Please read over the activities to familiarize yourself with them and bring the booklet along for reference. Feel free to participate in the activities with the children so you too can experience the exploration and share their observations.

Please try to complete all the activities during the field study. However, if the children are intrigued with one aspect, it is better to give them time to examine it than to rush onto the next activity. The children will be given their own Logbooks in which to record their observations.

Children should avoid trampling vegetation and removing things from the environment, so encourage them to come and get you if they find something exciting, rather than having the children bring things to you. They will be collecting pond animals for easier identification. These should be kept in a dish of pond water until the observations are complete and then gently returned to the spot where they were collected.

Thank you for volunteering your time. I am looking forward to an enjoyable day!

Sincerely,

Teacher

"If a child is to keep alive his inborn sense of wonder...he needs the companionship of at least one adult who will share it, rediscovering with him the joy, excitement and mystery of the world in which we live."

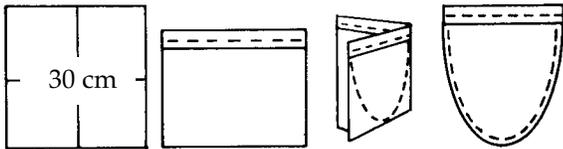
Rachel Carson, 1965)

APPENDIX II - HOW TO MAKE A DIP NET

Materials

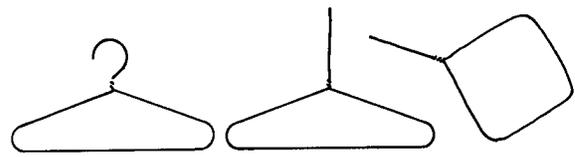
- 1 wire coat hanger
- 1 stick, one meter long, for the handle
- 1 piece of cheesecloth, net, or hose for the bag, 30 cm square
- 1 needle and thread for sewing (or a sewing machine)
- 1 piece of tape or wire to attach net to the handle

Instructions to Make the Net and Hoop



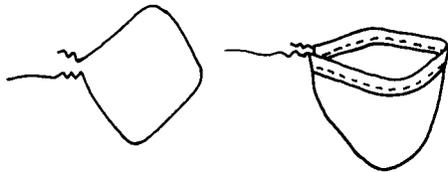
Step 1: Fold one edge of cheesecloth down and sew.

Step 2: Fold square in half and sew. Cut off the excess.

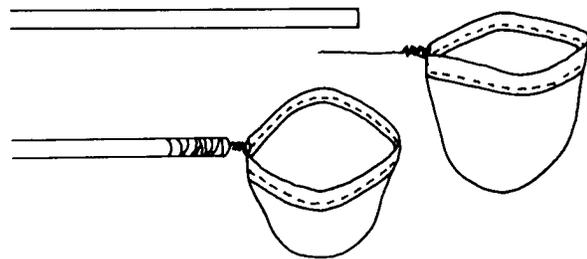


Step 3: Take a wire coat hanger, straighten the hook and form the hanger into a square.

How to Assemble the Net



Step 4: Open the wire square and thread on the net.

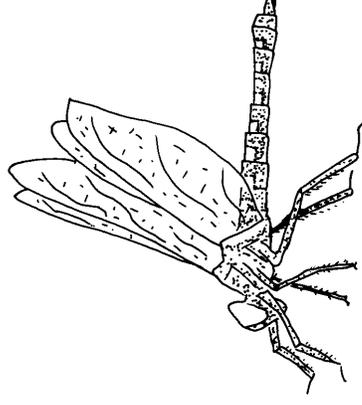
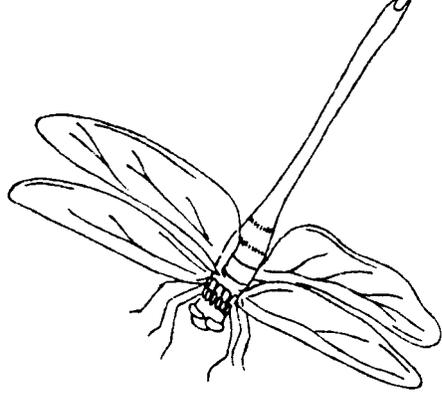


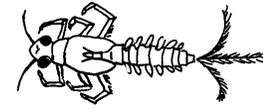
Step 5: Attach wire to a stick

How to Use the Net

Fill a white container with water. Sweep the net through the water or through plants growing in the water. After each sweep, empty the contents of the net into the container. Keep the containers in the shade so the animals don't get too hot. After you have finished observing the animals in the container, place the container in the water and gently let the animals go.

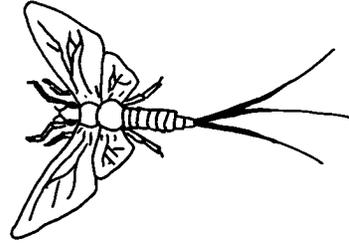
A FIELD GUIDE TO POND LIFE IN KANANASKIS COUNTRY





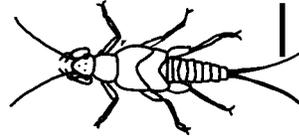
Mayfly nymph

actual size: 15 mm
Found on the bottom of ponds and creeks, clinging to rocks. Eats plant materials and tiny animals.



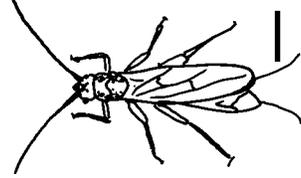
Mayfly adult

actual size: 5 - 15 mm
Often seen in large swarms flying up and down together. Adults do not eat. Look for their gently upturned wings and the long, thread-like filaments extending from their abdomens.



Stonefly nymph

actual size: up to 40 mm
Found under stones and debris at bottom of creeks and rivers. Nymphs shred underwater debris. Look for two sensory organs sticking out of their abdomens.



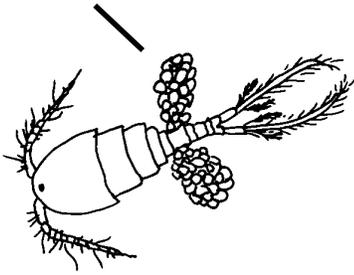
Stonefly adult

actual size: 15 - 40 mm
Poor flyers. Often found resting on objects along shorelines. Adults feed on algae. Two long filaments extending from their abdomens.

Draw your own discoveries in this space:

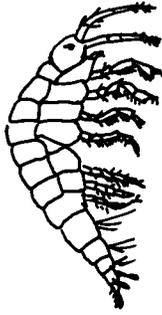
Copepod

actual size: 0.3 mm
Copepods use their legs and antennae to propel themselves through the water. They eat microscopic plants, animals, and debris. Look for the egg sacks which may be attached to their lower body.



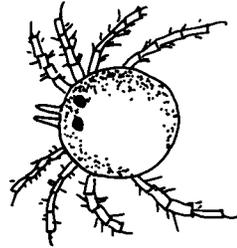
Sideswimmer or Scud

actual size: 5 - 20 mm
They swim using their legs which move in a blur. They eat the film which covers microscopic plants, animals and debris. They are also scavengers.



Mite

actual size: 2.5 - 5.0 mm
Mites are often red. They swim through the water, coming to the surface for air. They feed on small animals by piecing the body of their prey and sucking up the semi-digested materials of the prey. They are related to spiders.



Horsefly larva

actual size: 15 - 40 mm
Found on the bottom of ponds. Eat organic debris, worms and snails. The larvae crawl out of the water and burrow into the soil above water level.



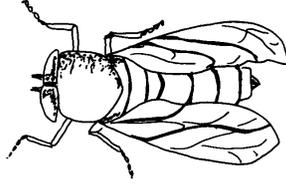
Horsefly pupa

actual size: 15 - 40 mm
Found buried in soil above water level where they remain until they emerge as adults.



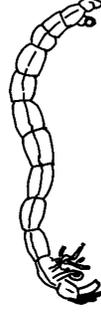
Horsefly adult

actual size: 10 - 25 mm
Often seen around horses. The males eat nectar. The females require a blood meal in order to produce eggs.



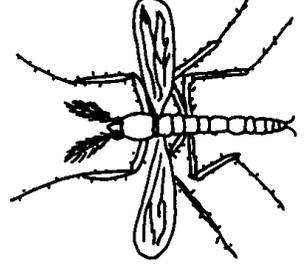
Midge larva

actual size: 2 - 30 mm
Found among debris at the bottom of ponds. These larva are often red in colour and wriggle. They eat debris and underwater plants.



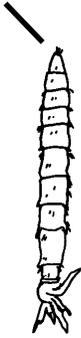
Midge adult

actual size: 5 - 10 mm
Often seen flying in swarms. Adults do not feed or bite.



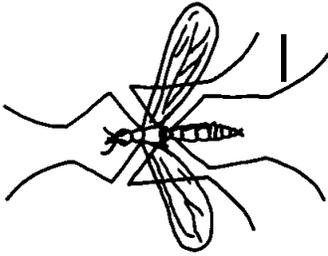
Cranefly larva

actual size: 10 - 50 mm
Found on the bottom of ponds. Eat plant materials. Disk at the end of tail thrust through water surface for breathing.



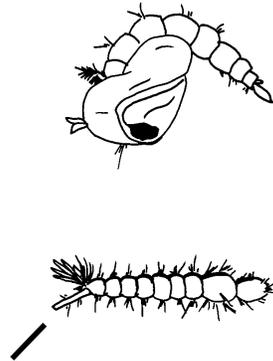
Cranefly adult

actual size: body 20 mm
Craneflies are not good fliers. They look like a mosquito with very long legs. They do not eat, nor do they bite.



Mosquito larva and pupa

actual size: 3 - 15 mm
Larvae hang upside down with their breathing tube breaking the water surface. Larvae are called wrigglers because of the way they move. They eat tiny plants and animals and are in turn eaten by fish and insects. The pupa are called tumblers. They do not eat.

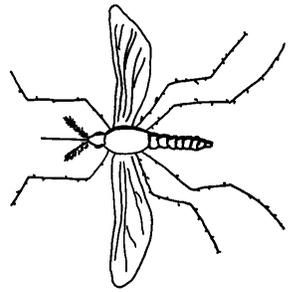


larva

pupa

Mosquito adult

actual size: 15 mm
The adult males eat nectar. The females must feed on the blood of animals in order to produce eggs.



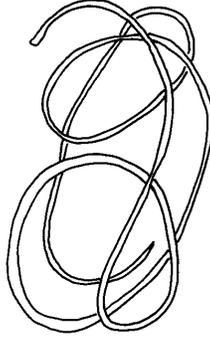
Flatworm (Planaria)

actual size: 20 - 25 mm
Found under submerged objects away from light. They eat small animals. They have light sensitive eye-spots on their heads.



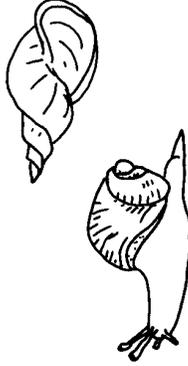
Horsehair Worm

actual size: up to 300 mm
Found in ponds, stream, and puddles. The adults do not eat. They resemble a horse hair which has come to life.



Snail

actual size: 2 - 70 mm
Found on submerged plants or floating beneath the surface of the water. They use their file-like tongues to obtain the plant material they eat by scraping it off rocks or shredding it. They use their muscular foot for crawling.



Leech

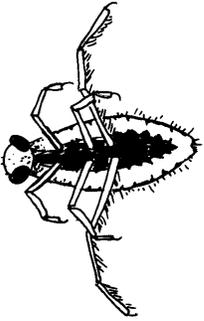
actual size: up to 100 mm
Leeches prefer dark places in ponds. They feed by piercing their prey and sucking their blood. They prey mostly on fish.



Backswimmer

actual size: 10 - 15 mm

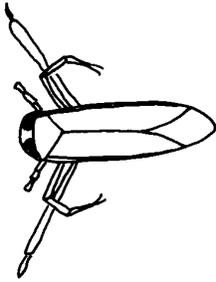
They swim on their backs using one pair of long legs to propel themselves. They appear silvery because of a coating of air bubbles which they take below as a source of oxygen. They eat other aquatic insects and small fish.



Water Boatman

actual size: 5 - 15 mm

Water Boatmen often cling to submerged vegetation. They swim erratically and can also fly. They eat small plants and animals.



Fairy Shrimp

actual size: 10 - 17 mm

They swim on their backs using their many legs to propel them. They eat microscopic plants and animals.



Water Flea (*Daphnia*)

actual size: 0.2 - 3 mm

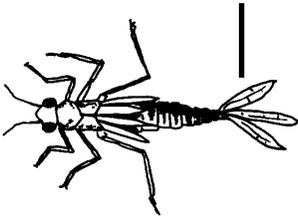
Swim with jerky movements using their first antennae to move them through the water. They eat microscopic plants and animals.



Damselfly nymph

actual size: 30 mm

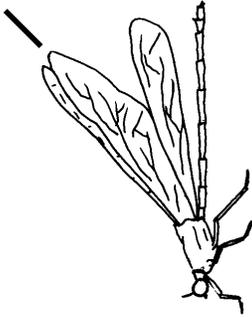
Found crawling about on underwater surfaces. Look for 3 leaf-like gills at the end of abdomen. Nymphs eat each other and other aquatic insects.



Damselfly adult

actual size: 30 - 40 mm

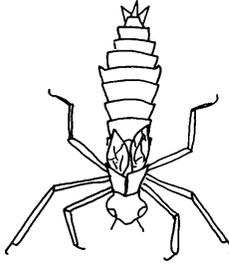
Found near ponds. When at rest, they hold their wings folded to their bodies. They eat other flying insects.



Dragonfly nymph

actual size: up to 50 mm

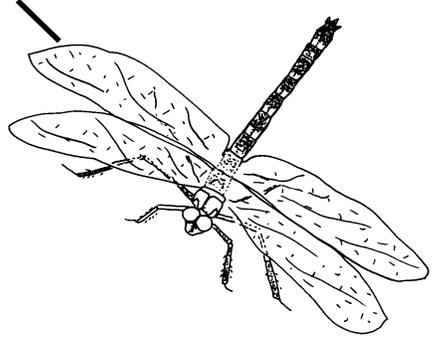
Found crawling on the bottoms of ponds. They eat other aquatic insects and are in turn eaten by fish and birds.



Dragonfly adult

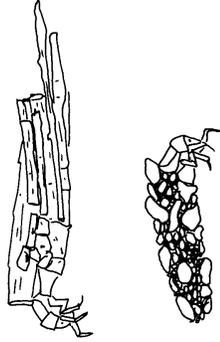
actual size: 40 - 80 mm

Usually seen flying or at rest near a pond. They eat other flying insects which they catch with their feet. Dragonflies hold their wings out when at rest.



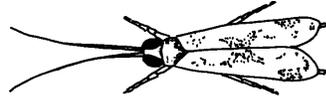
Caddisfly larva

actual size: up to 50 mm
Found on the bottoms of ponds and streams. They live in cases which they make out of whatever is on the stream bottom. They eat small plants and animals.



Caddisfly adult

actual size: 18 mm
The adults can be seen flying erratically at night. They look like a moth. If they eat, they only feed on nectar.



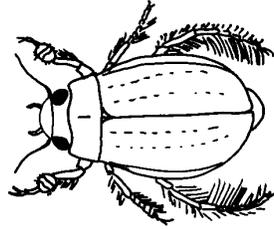
Predacious Diving Beetle larva

actual size: 25 mm
Found throughout the pond. They eat everything including insects, small fish and each other.



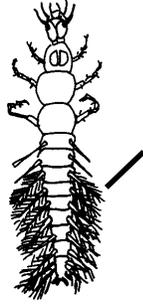
Predacious Diving Beetle adult

actual size: 10 - 40 mm
Usually found swimming in the deeper parts of the pond. They eat everything. They trap air under their wing covers and carry it underwater like a mini scuba tank.



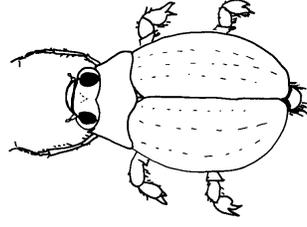
Whirligig Beetle larva

actual size: 3 - 7 mm
Found crawling on submerged vegetation. They are voracious carnivores. The threadlike filaments on the sides of their bodies are used for breathing.



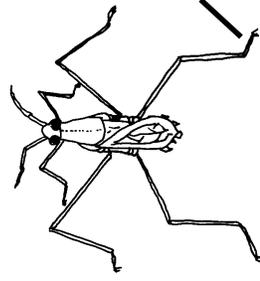
Whirligig Beetle adult

actual size: 3 - 7 mm
Found at the surface of the water swimming in whirling patterns. They are scavengers. They take air bubbles below the water as a supply of oxygen. They have two sets of eyes which allow them to see above and below the water at the same time.



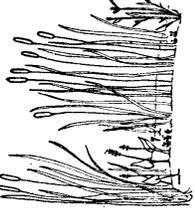
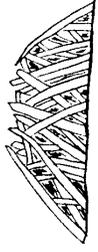
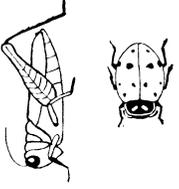
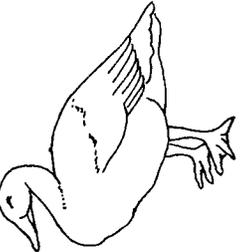
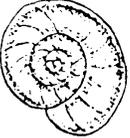
Water Strider

actual size: 10 - 15 mm
Water striders are found on the surface of the water. Their hairy feet and legs help keep them on the surface. They eat small insects which fall into the water.



POND BINGO

Check (✓) the things that you find on the Pond Bingo card. Your leader will have you work alone or with the rest of your group.

 dragonfly _____	 leaf _____	 cattails _____
 beaver lodge _____	 insects _____	 flower _____
 duck _____	 pond _____	 snail _____

POND PALS VOLUNTEER BOOKLET



TO THE VOLUNTEERS

The Pond Pals field study has been written to encourage students to investigate who lives in or near a pond community. All the plants and animals living together in an area form a community. They live in the community where they can best meet their needs of food, water, shelter, and space. Plants and animals living in a community interact with one another to meet their needs.

You will be leading a small group of students through the booklet activities. Each page of this Volunteer Booklet shows you what the students' booklets look like. It also gives you some directions to help the students in their discoveries. Each activity should take 5 to 10 minutes. After completing these activities, the whole class will get together for a discussion.

As you help the students work through their booklets, try to draw comparisons between the way plants and animals in the pond meet their needs and the way students meet their needs. Your main job is to help the students make their own discoveries rather than tell them the answers. If the students are not yet able to read or write, your job will also include reading the instructions to them and leading them in a discussion of their answers.

Remind the students that they will be observing living things. Show the students how to gently collect the pond animals in their nets and how to turn the net inside out into a full container of water to release the animals. The pond animals should always be kept in water in the shade. To release the animals back into the pond, submerge the container before **gently** tipping it out.

Thank you for your help. Have an enjoyable adventure!

POND BINGO

Assemble all the groups at a central meeting place for the **Pond Bingo** directions. The object of the **Pond Bingo** game is to look for things drawn on the bingo card and mark them off on the card as they are found.

There are two ways to play the game:

1. One way is to have the students in each group work together to fill the entire board. Each student can be responsible for finding one or two things. The volunteers stay in one place and the students go out and look for things. The volunteers mark off the items on the board as the students find them. The first group to complete their board shows their finds to the other groups.
2. Another way is to have the students work alone and try to find 3 items listed across or down on the board. Each student can also try to fill in their own boards.

Remind students that they are to look for things, not to collect them. They should replace any rocks they might move so as not to disturb any animal homes.

Pond Bingo ties together all of the elements of the field study and the concepts of community and basic needs.

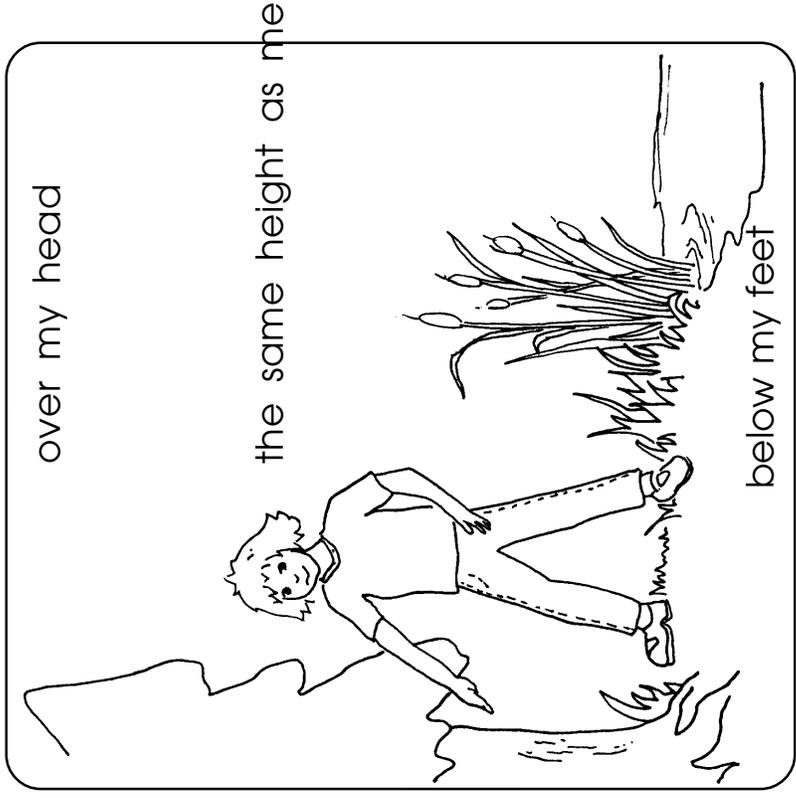
Plants and animals live in different areas of the pond. Have students look for an animal living above their head, at the same height as they are and below their feet. There is space on page 10 of their booklets to draw a picture of what they find.

Over their head includes birds, butterflies, flying insect, and squirrels; the same height as they are includes bushes, cattails, tree bark, beetles, and insects, and; below their feet includes fish, insects, frogs, worms, and grasshoppers.



POND HOMES

Find and draw one animal that lives in each of the following places at the pond:



This activity reinforces the idea of the pond as a community where plants and animals live together in a certain place and interact. Give each student a **Pond Pals** Student Booklet, a clipboard, pencil and string, a hand lens, and a spoon. Help your group construct a pond using the white dishpans or plastic containers. Using the Pond Exploration Kit, collect pond materials such as animals, rocks, mud, water, dead twigs, and leaves (no living plants). At the end of the field study, return the pond materials and animals to the places where you found them.



MAKE A POND

Make a pond with your group using your white dishpan or plastic container. Use your Pond Exploration Kit to collect pond materials such as rocks, mud, water, leaves, and animals. Go onto the next activity while you wait for things to settle in your pond.

Encourage your group to sit quietly for three minutes and listen for pond sounds. Animals which may be the source of pond sounds are drawn below. Have the students circle the pictures of the animals they hear. A space is provided on the next page for students to draw any other animal they might hear. Try to focus the students' attention on sounds in the immediate pond area rather than on distant human sounds.



POND SOUNDS

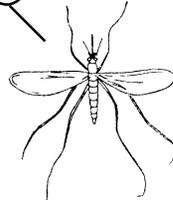
Sit quietly for 3 minutes and listen for pond sounds. Circle the animal which is making the sound.

quack-quack



duck

hum-m-m



mosquito

croak-croak



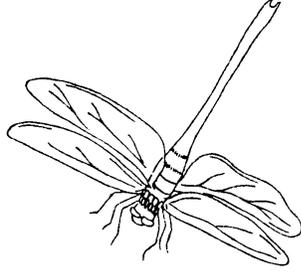
frog

In this activity, students will look for the food of a dragonfly (adult and nymph). Students draw a line from the picture of the dragonfly to the pictures of its food. After completing the activity, you can ask the students if they think this would be a good place for a dragonfly to live.



DRAGONFLY FOOD

Dragonflies eat small fish, worms, insects, and freshwater shrimp. Could a dragonfly find food at your pond? Draw a line from the dragonfly to the food that you can find in your pond. When you have finished looking for the dragonfly food, return the pond animals to the place where you found them.



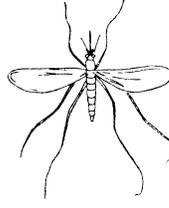
dragonfly



shrimp



worms



small fish

insects

Below is a 5 cm and a 10 cm ruler. Have students find a living thing that is **shorter** than 5 centimetres and one that is **longer** than 10 centimetres. Students can draw what they find in the space under the rulers. Each student may also share one of his finds with the rest of the group.

If time allows, encourage students to look carefully and think about the basic needs of the things they find.

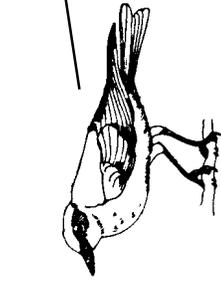


HOW BIG IS IT?

Find a living thing at the pond that is shorter than this line. Draw or spell what you found under this line.



Find a living thing at the pond that is longer than this line. Draw or spell what you found under this line.



chirp-chirp

bird



buzz-buzz

bee



whoos-s-sh

wind

Draw or spell another animal you hear:

Plants are part of the pond community. Plants, big and small, are eaten by animals. Students might guess, or you can tell them, that plants get their food from water, sunlight, and soil.



POND PLANTS

Which of the plants pictured below grow in or beside the pond? Circle the ones you find.



bushes



cattails



trees



grass

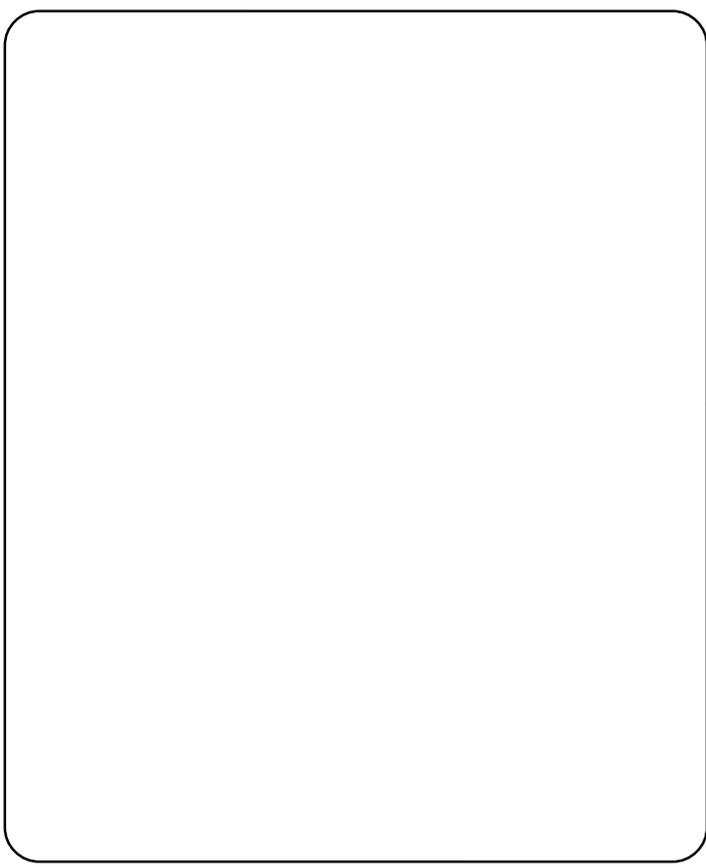
Many pond plants and animals can be seen with the naked eye. Smaller plants and animals can only be seen with the aid of a hand lens or microscope. Have students use this equipment to look at some of these smaller life forms in the pond. The hand lens can also be used to look at the body parts of the animal chosen for the picture.



POND ANIMALS

How many different kinds of pond animals can you see in your pond water?

Choose one and draw a picture of it in the space below.



POND PALS STUDENT BOOKLET



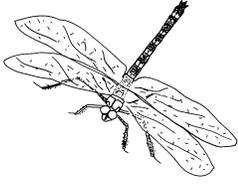
MY NAME IS: _____

MAKE A POND

Make a pond with your group using your white dishpan or plastic container. Use your Pond Exploration Kit to collect pond materials such as rocks, mud, waterleaves, and animals. Go onto the next activity while you wait for things to settle in your pond.

POND BINGO

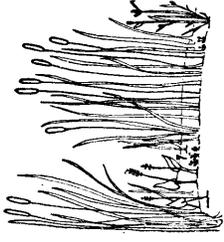
Check (✓) the things that you find on the Pond Bingo card. Your leader will have you work alone or with the rest of your group.



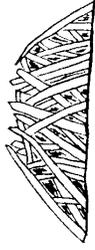
dragonfly _____



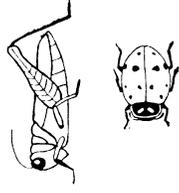
leaf _____



cattails _____



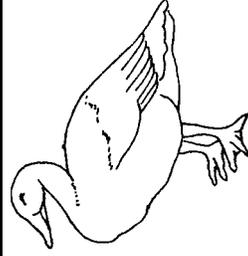
beaver
lodge _____



insects _____



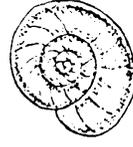
flower _____



duck _____



pond _____



snail _____

MY PICTURE

over my head

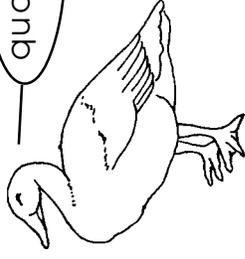
the same height as me

below my feet

POND SOUNDS

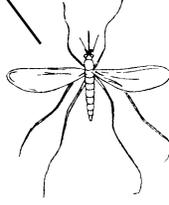
Sit quietly for 3 minutes and listen for pond sounds. Circle the animal which is making the sound..

quack-quack



duck

hum-m-m



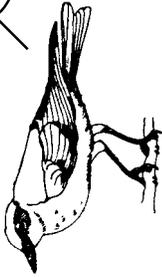
mosquito

croak-croak



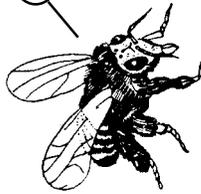
frog

chirp-chirp



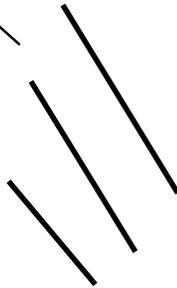
bird

buzz-buzz



bee

whoos-s-h



wind

Draw or spell another animal you hear:

POND HOMES

Find and draw one animal that lives in each of the following places at the pond:

over my head

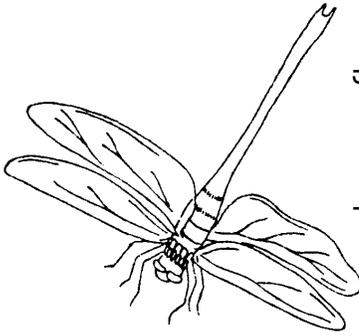
the same height as me

below my feet



DRAGONFLY FOOD

Dragonflies eat small fish, worms, insects, and freshwater shrimp. Could a dragonfly find food at your pond? Draw a line on the dragonfly to the food that you can find in your pond. When you have finished looking for the dragonfly food, return the animals to the place where you found them in the pond.



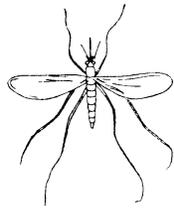
dragonfly



shrimp



worms



insects



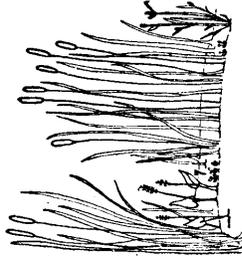
small fish

POND PLANTS

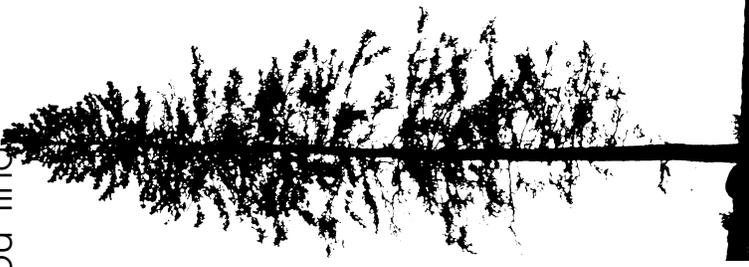
Which of the plants pictured below grow at your pond? Circle the ones you find.



bushes



cattails



trees

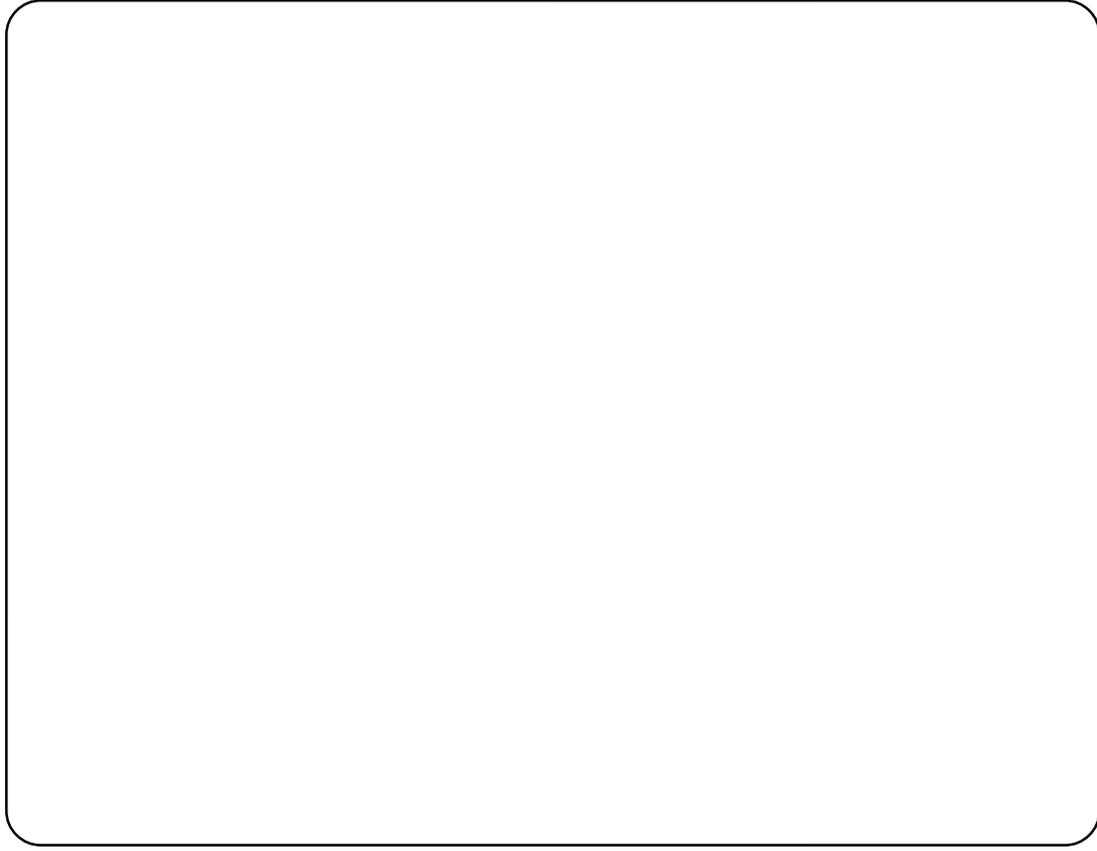


grass

POND ANIMALS

How many different kinds of pond animals can you see in your pond water?

Choose one and draw a picture of it in the space below.



HOW BIG IS IT?

Find a living thing at the pond that is shorter than this line. Draw or spell what you found under this line.



Find a living thing at the pond that is longer than this line. Draw or spell what you found under this line.

