

WATER SNAILS



OVERVIEW

By capturing, marking, releasing, and later recapturing water snails, the youngsters investigate the movement of snails in the snails' habitat.

BACKGROUND



The place where a plant or animal lives is called its **habitat**. In its habitat, an animal finds everything it needs to survive (e.g. food, shelter, and the proper physical environment). Living conditions usually vary within an animal's habitat. Some areas of the habitat may contain more food, while other spots may provide better protection from predators or more suitable physical conditions. This means that many animals have to move from place to place within their habitats to

meet their survival needs. Very small animals may move only a few centimeters in the course of a day, while large animals such as mountain lions or whales may travel many kilometers.

Freshwater snails are common inhabitants of ponds, lakes, streams, and rivers. They are usually found feeding on algae that grow on underwater rocks, mud, and plants. Some kinds of snails can be found feeding on dead plant and animal material in the water.

BIO
KEY
Bio-Technique
Mark and Recapture
Habitat



Because aquatic snails don't move very fast or very far in the course of a day, their habitat movements are fairly easy to investigate. They are easy to catch and often can be found in large numbers close to shore. Their ability to survive short periods of time out of water and their hard waterproof shells make snails ideal for mark-and-release studies. This activity can also be used with marine snails that live in rocky, intertidal areas.

CHALLENGE: CAPTURE SOME SNAILS TO FIND OUT WHERE THEY LIVE, AND THEN MARK AND RECAPTURE THE SNAILS TO INVESTIGATE THEIR MOVEMENTS.

MATERIALS



For each team of two:

- 1 observation chamber (See the "Aquatic Observation Aids" Equipment Card.)
- 2 long-handled dip nets*
- 1 bottle of bright fingernail polish* (a different color for each team)
- 1 clear plastic cup* or vial* for holding and observing snails
- 1 marking pen* or crayon (the same color as the fingernail polish)
- 1 small wooden stake to mark the release spot
- 1 hand lens* or bug box* (optional)
- 1 set of Action Cards
- 1 Recaptured Snails Data Card

For the group:

- 1 "Aquatic Observation Aids" Equipment Card*
- 1 "Sweepnet" Equipment Card*
- 1 sheet of Action and Recaptured Snails Data Cards*
- 1 data board or large drawing pad*
- black marking pen*
- several meter tapes*
- 1 roll of absorbent paper towels

* Available from Delta Education.

PREPARATION



Group Size. This activity works best with groups of up to twelve youngsters. For larger groups, we recommend one adult for every twelve youngsters.

Time. Plan on forty to fifty minutes for each of two sessions. It is best to conduct the second session the day after the first session. Try to choose warm days.

Site. Choose an aquatic site with lots of snails. Aquatic snails are often abundant in the shallow water of ponds, streams, and lakes. Each team will collect at least 35 snails.

Clothes. The youngsters may get muddy and wet, so suggest wearing old clothes and tennis shoes.

Collecting Snails. The youngsters can pick up the snails by hand or with dip nets. Before the activity begins, collect a few snails to use in introducing the activity.

Safety. When working around the water, use the buddy system. (See the "Safety" section of the *Leader's Survival Kit* folio.)

Data-Board Map. Draw a map of the activity site, including stream edges and site boundaries, on the data board.

ACTION



DISCOVERING WHERE WATER SNAILS LIVE

1. Explain the buddy system for water safety, and divide the group into buddy teams.

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2. Show the group the water snails you collected. Tell the youngsters that they will find out where the snails live by collecting some. Emphasize that the youngsters should observe *where* they find the snails before picking them up by hand or scooping them up with a dip net. (Demonstrate the use of the dip net, if necessary.) Point out limits for the activity site, and give each team two nets and an observation chamber. Challenge each team to collect at least 35 snails.

3. Help teams who are having trouble finding snails.

4. When the teams have collected enough snails, call the teams back and ask them to describe the places where they found snails. Tell the youngsters they have just described the habitat of the water snails they found. Define **habitat** as the place where a plant or animal lives.

5. Mention that many animals must move around in their habitats to find enough food, shelter, and the right physical conditions for their survival. Ask the youngsters if they think snails move from place to place in their habitat. Tell the teams that they will find out by using a mark-and-recapture technique. Explain to the kids that they will release their snails after marking them. Then they will return and try to recapture their marked snails.

MARKING SNAILS

1. Demonstrate the snail-marking technique outlined below:

- Scatter the snails on a paper towel, and allow their shells to dry. (Use additional paper toweling as a blotter to speed up the drying.) As soon as the shells are dry, carefully place a *small* dot of polish on the shell with the nail-polish applicator. Be careful *not* to get polish near the opening of the snail's shell. Let the polish dry for five to ten minutes.

2. Give each team a different color fingernail polish, and let the teams start drying and marking the shells.



3. Move from team to team, checking to make sure the shells are dry before the youngsters apply the polish. Each team should mark 30 snails for release. The remaining snails will be used with the Action Cards.

4. Discourage handling of the snails for the five to ten minutes the polish needs to dry. While the teams are waiting, distribute the Action Cards, hand lenses or bug boxes, cups, and vials. Challenge the teams to spend a few minutes solving the two challenges with their unmarked snails.

5. Have each team share its observations and solutions to the Action Cards.

RELEASING THE SNAILS

1. Ask each team to select a release point for its snails. Have the teams record their snail-release spots on the data board map with marking pens that are the same color as the teams' fingernail polish.

2. Each team should release 30 snails close to the shoreline at their release point, and mark that spot by sticking a small wooden stake into the shore at the water's edge. (Each team should also mark its stake with a dab of color to make the stake easier to relocate the next day.) Ask the teams to spend a few minutes observing what the snails do after being released.

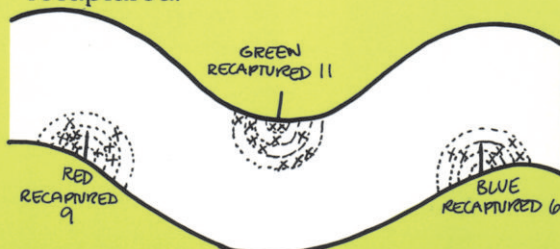
ONE DAY LATER...

1. Ask the teams to return to their snail-release points. With meter tapes, help the teams mark off points that are 0.5 meter, 1 meter, 1.5 meters, and 2 meters on either side of their snail-release markers. The teams can mark the distances with rocks, sticks, or lines in the shoreline.

2. Challenge the teams to search each zone (0.5, 1, 1.5, and 2 meters) around their snail-release points separately for their marked snails. Ask the youngsters to record on the Recaptured Snails Data Card *where* and *how many* marked snails they find in each zone. Tell the teams they should collect only marked snails.

3. Hand out nets, observation chambers, data cards, and pencils to the teams and let them begin searching for their marked snails around their release sites. Allow plenty of time for the teams to search. While the teams search for marked snails, draw search-zone lines around each snail-release spot on the data board like the ones on the Recaptured Snails Data Card.

4. After the search period, have each team transfer its snail data to the data board by marking an "X" of the appropriate color for each snail recaptured.



5. Tell the youngsters to release all their snails.

PICKING UP THE SNAIL PACE

Display the data board so all the teams can see it.

1. Which team recaptured the greatest number of its marked snails? Why do you think that team caught so many of its marked snails? Do you think the place where the snails were released had anything to do with the team's success? Why?

2. In which search zone (0.5, 1, 1.5, or 2 meters) around the release points were most of the marked snails found? What was the greatest distance from their release point that you found marked snails? The smallest distance? How far did most of your recaptured snails seem to move? Did any team find snails in its area that were marked by other teams? Why do you think they moved so far away from their release points?

3. Were there any search zones around your snail release points that were difficult or impossible to sample? Which areas?

4. What do you think happened to marked snails that were not recaptured?

5. What do you think happens to snails that cannot find a suitable habitat?

6. What are suitable habitats for people? What are unsuitable habitats? What do people do when their habitats become unsuitable? How far do you think you move within your habitat in the course of a day?

BRANCHING OUT

Use the mark-and-recapture technique on garden snails.



AQUATIC OBSERVATION AIDS: For Aquatic Activities

Equipment Card



Side 1



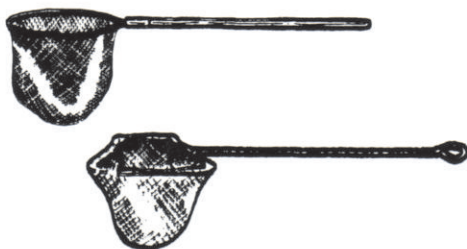
Bug Boxes

A bug box is a small, clear plastic box with a magnifying lens for a lid. To use the bug box, place an object or organism in the box and replace the lid to magnify the contents. When exposed to direct sunlight a closed bug box heats up rapidly, so release organisms promptly after observing them. The lid can also be used separately as a magnifying lens.



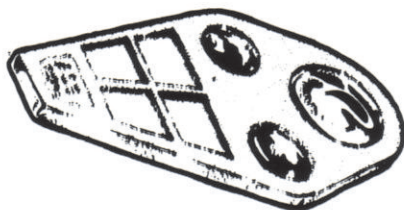
Dip Nets

Nets can either be made or bought. Aquarium nets work fine. You may want to extend the reach of an aquarium net by attaching a dowel, a stick, or a similar extension to the handle. A gradual, gentle scoop of the net is usually more successful and less damaging to organisms than a sudden, violent scooping motion. To prevent eye accidents, ask that the nets never be raised above shoulder level.



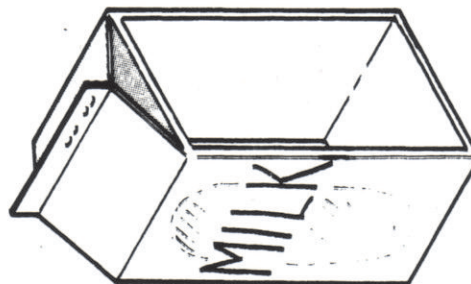
Magnifying Lenses

To use a magnifying lens, hold the lens close to one eye and move either your head or the object back and forth until you can see the object clearly.

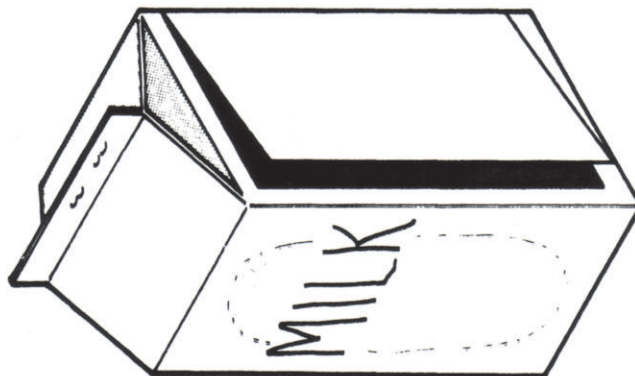
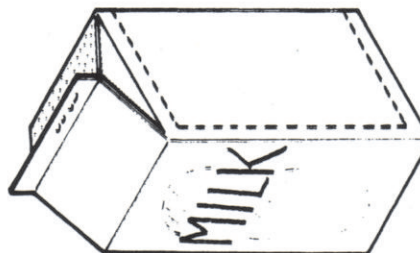


Observation Tray

Any container that will hold water can serve as an observation tray. Containers with light-colored bottoms are best for easy viewing of organisms that have been added. Half-gallon milk cartons can be made into deluxe observation trays. To make one, staple the pouring spout closed and cut out the carton wall on the same side as the stapled pouring spout.



To make a hinged-top observation tray, just cut along three sides (two short and one long) of the carton wall on the same side as the stapled spout.



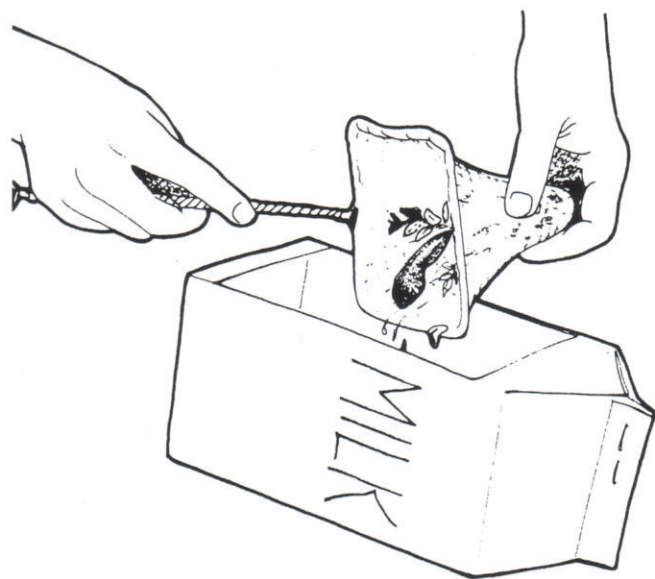
AQUATIC OBSERVATION AIDS: For Aquatic Activities

Equipment Card Side 2

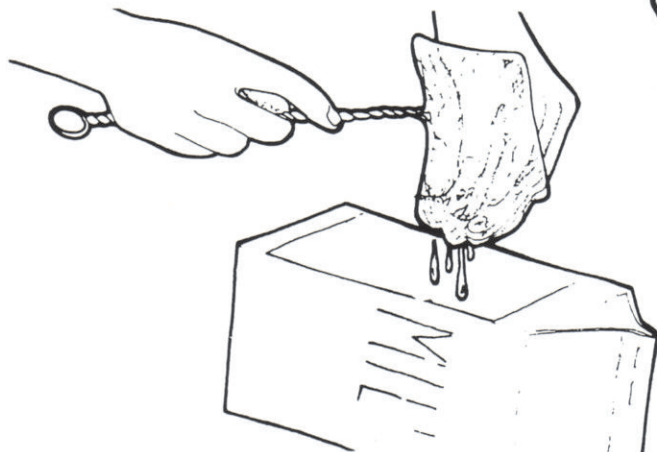


Transferring critters to observation trays.

When using a net to transfer critters, first swish the net through the water without releasing the organisms. (You can use the pond or stream you are investigating.) The rinsing removes any sediment you may have netted. Fill your observation tray about one-half full of water (preferably water from the organism site). Hold the net hoop over the tray,



turn the net inside out, and dip the net bag into the water in the tray.



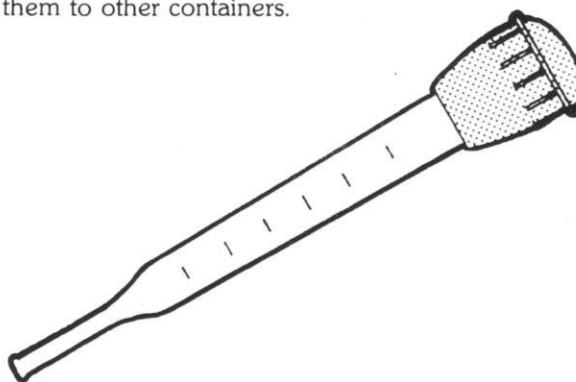
This will release netted organisms into the tray.

Spoons and Clear Plastic Cups

Spoons and cups are useful for transporting tiny organisms and observing them at a close range.



Simply dip up tiny organisms with a spoon or cup and place the organisms in a container partially filled with clear water. Turkey basters are also useful for sucking up tiny organisms and transferring them to other containers.



Note: All of these aids are available from Delta Education.

SWEEPNET

Equipment Card



Side 1



Note: Commercially available sweepnets* are more durable and we suggest such an investment for schools, camps, or clubs.

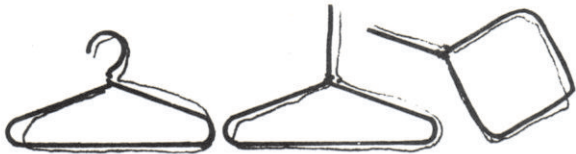
MATERIALS FOR ONE SWEEPNET:

- 2 wire coat hangers or 1 piece of heavy-duty wire
- 1 dowel or broom handle about one meter long and 1.5 cm in diameter
- 1 piece of nylon netting* (mosquito netting), .75 square meter
- 1 needle and thread for sewing (or a sewing machine)
- filament or duct tape*
- 1 pair of pliers

* Available from Delta Education.

MAKING A SWEEPNET:

1. Preparing the Hoop. Take the wire coat hangers, straighten the hooks and pull the hangers together into a square (one hanger on top of the other). The pliers make this job easier.



2. Preparing the Bag. Your net should be approximately .75 meter in circumference at the top, tapering down to a point. A sewing machine speeds up construction, but older kids can hand sew the nets if sufficient time is provided. Sew like this:

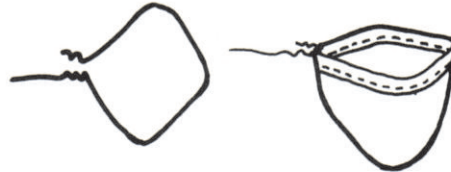


Fold one edge down and sew

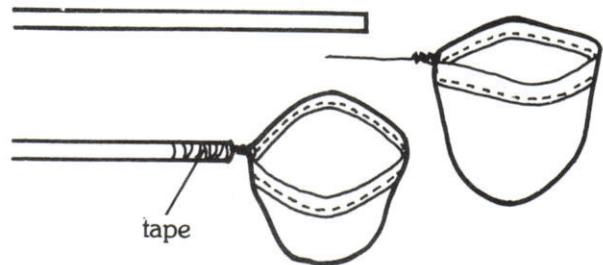
Fold square in half and sew

Cut off excess

3. Assembling the Net. Open the wire square (both squares, if you used two hangers) and thread the net on the wire (or wires).



Attach the wire hoop to the stick.



USING A SWEEPNET:

While a sweepnet can be used to pursue and capture an animal that has caught your eye, this is not the most efficient use of the net. A sweepnet is best used as a random sampling tool. You walk at moderate speed across a grassy area, sweeping the net back and forth in pendulum fashion, in front of you. The net should just brush across the top of the grass. The idea is to sweep any animals that are buzzing around in front of you into the nets, so you must turn the net in your hand to capture animals on both right and left swings of the net. After you have made fifteen to thirty swings of the net, make a quick swing around your head to concentrate the animals at the bottom of the net, and grab the top of the net in your hand to keep the catch from escaping.

SWEEPNET

Equipment Card



Side 2



TRANSFERRING ANIMALS FROM THE NET TO AN OBSERVATION BAG:

1. Concentrate the animals in the bottom of the net.



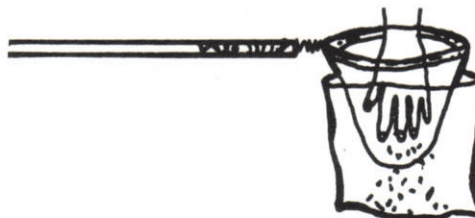
2. Pinch the net closed, keeping the animals in the bottom of the net.



3. Turn the net inside out while holding the animals.



4. Place the net in a plastic bag, then release and shake the animals into the bag.



5. Grab the top of the bag.



6. Twist the top of the bag a couple of times and tuck the top under your belt or into an open pocket while you continue to sweep.

Water Snails Action Card



Can a snail walk
upside down...

- in water?
- out of water?
- on your thumb?

Hint Try it.



Water Snails Action Card



With only one foot, how does a snail walk?

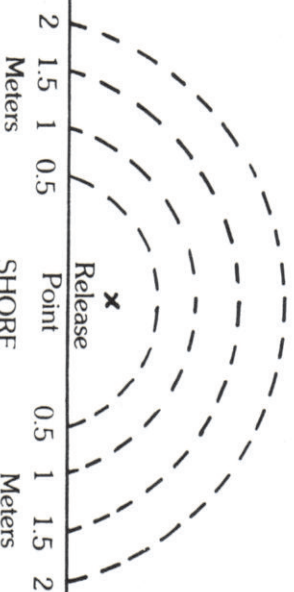
Hint Place a snail and some water in a vial or cup you can see through.



Water Snails Recaptured Snails Data Card



Mark the locations where you recaptured marked snails.



Water Snails Recaptured Snails Data Card



Mark the locations where you recaptured marked snails.

