

Exemplar 16

Investigating a freshwater pond

middle classes

A small freshwater pond is an ideal habitat for primary children to study. Ponds can be found in urban and in rural areas. Most of our inland canals have very similar characteristics to ponds and provide essentially the same habitat for wetland creatures. Late spring and summer are the best times for practical work with ponds, streams and rivers.

Preparing for the habitat study

Safety

Successful and enjoyable pond investigations require sensible planning, good supervision and adherence to safety rules. The following guidelines should be noted:

- children should work in small groups, under the direct supervision of an adult
- only one group, of between four and six children, should dip at a time. The other children should be positioned well back from the edge and be actively engaged in observing weather conditions, plant and animal life
- use only safe areas of the surrounding banks, from which children can pond-dip or collect samples of water
- children and adults should wear protective rubber boots
- skin infections, grazes or cuts should be covered
- children and adults should be made aware of the position of lifebelts and safety notices in the area
- children should wash their hands before and after handling animals, plants or soil
- children should not handle anything that may be hazardous
- ponds with an algal bloom or water pollution should be avoided. During preliminary visits teachers can assess the health of the pond, and water that has been contaminated with chemicals should be avoided.

Equipment

Pond-dipping provides children with opportunities to design and make a variety of pond nets from materials such as curtain netting, coat hangers, broom-handles, bamboo canes, stockings and muslin. Other equipment will also be required. Make sure that each group has access to

- a flour sieve for investigating the bottom mud
- a white plastic tray or margarine tub for holding the catches
- buckets and pots for collecting water samples
- small plastic containers for holding individual plants and animals
- magnifiers and nature viewers
- plastic spoons and soft-haired paintbrushes for transferring animals from trays to containers
- large screw-top plastic jars for carrying specimens
- identification aids, books and leaflets
- a towel
- clipboards, pencils and workcards, which are kept in large clear polythene bags.

An aquarium (plastic tank) should be set up in the classroom to house some specimens that require further investigation. Add some clear pond water (about one-third of the capacity of the tank), some pondweed and stones. The classroom aquarium and the white trays used for housing catches at the pond should be kept out of direct sunlight. Carnivores should be placed in separate containers.

Finding out the children's ideas

Before visiting the pond it is helpful to establish the children's ideas about ponds and pond life. Ask the children to consider the kinds of animals and plants that live in a pond.

Children can make lists or drawings of the animals and plants that they think might be found there. Older children may make sets of the animals and plants they think they will find underwater, at the water's edge or in the air.

It is advisable that children be able to recognise some water animals before going on their first visit to the pond. These animals may include the great diving beetle, water boatman, dragonfly and damselfly nymphs. Secondary sources may be used to help children identify common animals before their pond visit.

Observing and recording environmental features

On arrival at the pond children may

- make a map of the area, sketching in features of the habitat. The presence of houses, factories, farms and roads in the nearby area should be recorded
- measure the length and width of the pond at different points (see *Teacher Guidelines for SESE: Geography*)
- look at the area surrounding the pond. Record whether the incline of the banks is steep or gentle
- record the air and water temperature. Children should observe the parts of the pond that are shaded or in direct sunlight.

Assess the use of the pond. Children should look for signs of how the pond is used by animals and/or people:

- look for evidence of water entering the pond from different sources, such as a small stream, drainage pipes or run-off from land
- look for evidence of water leaving the pond

- look for various footprints in the soft mud by the side of the pond
- record the numbers of birds seen and any feeding habits observed. Children should draw sketches of birds and write down as many details as possible. These descriptions and diagrams will assist in their identification.

Investigating pond water

The children will observe and examine the water to see how clean it is and whether it is moving or stagnant. Samples of water from different parts of the pond can be taken, stored in separate containers and labelled. Care should be taken that the bottom mud is not stirred. The children should record whether the water is clear or muddy. The smell and colour of the water should also be noted.

The speed of the current

Children can determine the current speed of the pond or canal using the float method. The time taken for an orange to float between two points a known distance apart should be noted.

Observing plant life

Children should observe the plant life of the pond and identify the trees and shrubs growing nearby. Record the plants that occur at the pond edges. A line transect, crossing from a marsh zone to the swamp zone, will provide older children with a variety of plants to identify and observe.

Children should search for plants that are rooted under water but with floating leaves. The area of water they cover can be indicated on the map.

Pond-dipping: observing animals

The children should look at the surface of the pond for evidence of animals such as pond skaters and whirligig beetles. Close observation of the surface of the pond may indicate the presence of fish or amphibians.

Children, in closely supervised groups, should take samples from the water. The first sweeps of the net should be made in open water with the whole of the net bag beneath the surface. The net should be pushed through the water for a distance of about two metres, making sure that the bottom mud is left undisturbed and that the net is lifted out quickly. White trays or basins that are half filled with water should be prepared to receive the catch. Children should observe closely to see water minibeasts darting about.

Children should collect animals from the water in specific areas. They should record what animals occur and observe what they are feeding on. The relationship between the location of certain species of animals and the presence of certain plants should also be investigated.

A few minutes is sufficient for dipping at the one location.

Food chains

Children should consider the questions

- What feeds on each of the pond organisms?
- What is the food for each pond organism?

The feeding relationships between organisms in a pond is simply represented using a food chain.

Children can establish different food chains in the pond by observing animals as they feed.

Food webs, which incorporate all the food chains in the pond community, may be explored by children in the senior classes who have a firm understanding of food chains.