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The Pond Pack

Background information and resources for teachers

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THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

Introduction

This pack contains useful resources and ideas about pond dipping at Holland Park for KS1 and KS2 teachers. The content and activities can be adapted to suit the different needs of classes and age groups. It aims to give teachers a better understanding of the habitat and provides suggestions for pre and post visit activities.

The pack contains photocopiable worksheets and identification sheets that may be used on the visit or could form the basis for follow up work.

Key vocabulary is written in bold in the text and a short definition of each term can be found in the glossary along with suggestions for further reading.

Contents

- Previsit ideas
- Post visit ideas
- How to pond dip
- Information about the pond and its inhabitants
- Pond invertebrate identification sheets
- Pond invertebrate key
- Worksheets
- Glossary and further reading
- Letter to class about their forthcoming visit

Why Pond dipping?

Pond dipping is a fun and simple way for children to explore an aquatic habitat. Children will be able to observe a diversity of different creatures from leeches to dragonfly nymphs. It is a useful tool in delivering the science primary curriculum section on life process and living things (Sc2). It can also be used as a stimulus for art, English or maths activities.

How to Pond dip for self led groups

The Ecology Centre will provide all the equipment needed. This will consist of white trays (one per pair), magnifiers (one per pair), nets, identification sheets and keys.

At the wildlife area there is a large dipping platform by the wildlife pond. Before starting pond dipping with the group please remind them of health and safety and behaviour rules. Ask the group to sit away from the pond.

Half fill the white trays with pond water, place the trays along the platform pond's edge and put a net either side of the trays. Invite children to start pond dipping; younger children should lie on their stomachs with only their heads peering over the pond platform edge whilst older children can kneel by the edge.

Up to six pairs (12 children) can do pond dipping at once. In large groups the waiting children could look at a dipped tray or do sketching of the pond.

Allow the children up to ten minutes to pond dip. Adults should then carry the trays to a place on the platform away from the pond edge and hand each pair a magnifier to observe their finds.

The best way to pond dip is to make a figure of eight or a circle in the water. Dipping by plants or by the edge is often more productive. Try not to dip too much mud as this will make it hard to see any creatures caught. Turn the net gently inside out into the pond tray so the creatures can swim out. Let the water settle and look at what you've caught.

After dipping gently tip the tray water back into the pond and rinse the trays and nets in the pond.

Health & Safety and Risk Assessment

Pond dipping is a very enjoyable activity but it does carry a number of potential risks, these can be easily reduced by following these guidelines.

1. Group ratio: Please ensure you have a ratio of at least one to eight by the pond.

2. Behaviour by the pond: All children should be made aware of the deep water and asked not to run or be silly near the edge.

3. Pond dipping should only be carried out by children kneeling on both knees or lying flat on their stomachs.

4. Weil's disease is a water borne disease; to prevent infection all open cuts and grazes should be covered with a waterproof plaster or pvc gloves as required.

5. To prevent infections children should be reminded not to put their fingers in theirs mouth, nose or eyes and should wash their hands afterwards.

A full risk assessment for this activity is available on our website. Please contact the Ecology Centre for further enquiries. It is advisable to have the Ecology Centre and Parks Police numbers to hand when at the wildlife area in Holland Park.

Previsit Ideas

Before coming to the Ecology Centre with your class you may find the following ideas useful to set the scene and further learning.

- Discuss the term **minibeast** and **invertebrate** - compare and contrast with other animals including themselves. Appearance, lifecycle, movement, how they get oxygen.
- Revise what is a **habitat.**
- Display enlarged pictures of common pond animals (from the enclosed ID sheets or pictures from the web) and ask them to research their favourite pond creature – internet or book based (ICT/science).
- Discuss what might live in a pond and what all animals need to survive.
- Work on **food chains** and **food webs** - construct a simple food chain about known animals to contrast with those found in a pond.
- Work on **keys** to identity creatures or objects.
- Devise a code of conduct for pond dipping (citizenship and H&S)
- Work on **lifecycles** particularly that of the frog. If your visit is in springtime the pond should have frog and toad tadpoles in it, later in early summer the pond should have efts (newt tadpoles) present. All year round the pond is home to invertebrates like mayfly and damselfly nymphs.
- Read to the class the ‘dear class’ letter from this pack as a way to stimulate interest and gauge understanding.

Post visit ideas

To consolidate learning a follow up or post visit activity is often useful. This could take the form of a short task or a more longer term project.

Possible suggestions:

- Create minibeast pond creatures using clay and natural materials from the wildlife area or art materials back at school.
- Display work about pond creatures- children could draw or paint different minibeasts this could help reinforce work on **adaptation**, movement and where they live in the pond.
- Children could write a story in first person as an **invertebrate** or tadpole living in the wildlife pond and the dramas it faces to survive. (Literacy link)
- Recount of trip or a non chronological report writing about the creatures found in the pond (Literacy link).
- Use the data collected on tally charts to produce graphs to different graphs. (Numeracy and data handling).
- Play pond **food chain** or **food web** games to enable children to appreciate the importance of invertebrates.
- Comparison work with another habitat such as the woodland.
- Pond pollution - learn about 'indicator' species and find out which of the fresh water minibeast are indicators of clean water (Yr 6) (see pond survey sheet).

Pond Food chains and food webs

A food chain shows a simplified feeding relationship in a habitat. They are useful in show how plants and animals are connected. Food webs show the different relationships more fully as many food chains interconnected.

Green plants are termed **producers** as they convert energy from the sun into food for themselves by a process called **photosynthesis**.

Consumers

Consumers are animals that get their energy directly or indirectly from plants. **Primary consumers** or **herbivores** eat plants as their source of energy.

Animals that eat other animals are called **carnivores**. In a food chain secondary consumers eat primary consumers to obtain their energy while a **Tertiary** consumer is one that eats a secondary consumer other animals.

Omnivores eat both plant and animals.

Detritivores eat dead organic matter (plants or animals) to survive.

Examples of animals for each group are given below and overleaf but this is a simplified version as many animals fall into more than one category.

Holland Park
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Pond Food Chains

All animals and plants need food to grow and move.

Animals that eat plants are called herbivores.
Animals that eat other animals are called carnivores.
Animals that eat both plants and animals are called omnivores.
Animals that eat dead plants and animals are called detritivores.

This is a simplified feeding or tropic level chart of the animals found in our pond.

Invertebrate Name	Feeding or Trophic level
Pond snail	Herbivore/ Detritivore
Phantom midge larvae	Carnivore
Midge larva	Herbivore
Rat-tailed maggot	Detritivore
Leech	Carnivore
Flatworm	Carnivore
Mayfly nymph	Herbivore
Dragonfly nymph	Carnivore
Diving beetle	Carnivore
Water mite	Carnivore
Freshwater hoglouse	Detritivore
Freshwater shrimp	Detritivore
Water flea	Herbivore
Pea mussel	Herbivore
Greater water boatman	Carnivore
Lesser water boatman	Herbivore
Mosquito larva	Herbivore
Damselfly nymph	Carnivore
Water scorpion	Carnivore

Vertebrates

Frog	Carnivore
Newt	Carnivore
Tadpole	Herbivore

Information about Pond Wildlife

Invertebrates – animals without backbones

A healthy British pond can be home to a vast diversity of invertebrates over 115 species.; Some of which only complete part of their lifecycle in the pond whilst others need an aquatic environment for all of their lifecycle.

Most species are insects there are also crustaceans, annelids (worms), snails and arachnids (spiders and their relatives).

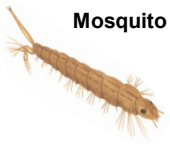
The diversity of species is dependent on water quality as a general rule the more polluted a watercourse is the fewer the number of species.

Insect Larvae and Nymphs

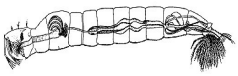
Many flying insects lay their eggs in the pond and their young called nymphs or larvae live under water before changing into adults. .

Larvae are maggot-like insect young, sometimes with legs.

Midge larva



Mosquito larva



Phantom Midge larva

Nymphs look more like adult insects but without wings, usually with jointed legs

Mayfly nymph

A number of different mayfly species lay their eggs in the pond, some take only two months to mature as adults whilst other species take two years. The presence of mayfly in the pond shows the pond has high water quality. Mayfly are very short lived as adults although one species can live for a fortnight

Damselfly nymph

Damselfly nymphs live underwater for about six months before turning into an adult. The main species recorded is the common blue damselfly.

Dragonfly nymph

Dragonfly nymphs can live underwater for up to two years before turning into adults, dependent on the species. The main species seen flying as adults are the emperor and ruddy darter

Both damselfly and dragonfly nymphs are voracious predators with larger nymphs preying on tadpoles.

Information on Pond Wildlife cont.

Pond invertebrates

Common invertebrates who live all their lives in the ponds are:

Crustaceans (animals that are related to crabs and shrimps)

- Daphnia or water fleas – tiny free swimming crustaceans that mainly feed on algae. They are termed water fleas because they swim in a jerky motion. They are the most common animal in the pond and vary in colour from orange to almost transparent.

- Cyclops – similar in size to daphnia. Termed Cyclops as they only have one eye like the giants in Greek mythology.

- Water or hoglouse – related to woodlouse, these live at the bottom of the pond feeding on dead organic matter. Water louse carry their eggs and small young on their tummies.

- Freshwater shrimp – smaller freshwater species of marine shrimps. They belong to the decapods as they have ten legs.

Molluscs – gastropods

- Pond snails – the two types that are found in our pond are the ramshorn and the great pond snail. Both are mainly plant eaters but will eat dead animal and plant matter.

Insects (six legs and three body parts)

- Greater water boatman – fast moving predators who swim upside down catching prey with their jaws.

- Lesser water boatman – not closely related to the greater water boatman. These creatures swim the right way up and eat algae.

- Greater Diving beetle – a large carnivore that breathes using a bubble of air on its body.

- Water scorpion – not related to scorpions. It has large front legs for catching its prey and its long tail acts as a snorkel

- Pond skater – lives on the surface of the pond and hunt for struggling insects by vibration. Their feet have water repellent hairs that hold tiny air bubbles to allow them to walk on water.

Other

- Leech – related to worms and are parasites. They feed on the body fluids of other animals attaching themselves by a sucker. None of the leeches in our pond can pierce human skin. Leeches can swim but most often move along the bottom of the pond.

Information on Pond Wildlife cont.

Vertebrates (animals with a backbone)

Amphibians

The park is home to three species of amphibian, the common frog, the common toad and the common newt. An amphibian is a moist skinned animal which has a gilled aquatic larva that transforms into an adult with air breathing lungs.

Common toad – toads tend to be larger than fogs and have more warty skins and are poorer jumpers. They can vary in colour from dark brown to orange. They come to the pond in spring to spawn and toad spawn is laid in long strings. Toad tadpoles are darker and smaller than frog tadpoles They also tend to swim in large shoals. Once changed from tadpoles to toadlets they hide under rocks, logs and in deep vegetation.

Common Frog – frogs have smooth skin and are excellent leapers. Frog spawn is laid in clumps in early spring and tadpoles are present in the pond until about May. After metamorphosis the young froglets leave the pond for long grass and woodland.

Both frogs and toads produce a lot of spawn or eggs, over 5000 eggs maybe in a string of toadspawn. Out of this number only a handful will reach maturity due to heavy predation from other creatures including water beetles, dragonfly nymphs and birds.

Common newt – newts return to the pond in late spring to breed. Female newts are brown in colour and the males are brighter in colour with spots.

Newts lay their eggs individually wrapped in the leaves of submerged plants and newt tadpoles are called efts. They are light brown in colour and have gills.

Information on Pond Wildlife cont.

Vertebrates (animals with a backbone)

Birds

Moorhen
A pair of moorhens are resident on the pond all year round, during the summer they can have up to three broods and feed on pond vegetation and invertebrates.

Mallard

Mallard ducks nest around the park. In early spring a number of mallard often appear on the pond before pairing to breed. The duck can lay up to 15 eggs so large broods of ducklings are not uncommon, sadly most do not survive.

Grey heron
Heron will come to the pond to feed on small amphibians.

Identification sheets

Identification of pond invertebrates can at first be difficult. It can be made easier by focusing on features like size, number of legs and number of body parts. How the animal moves and behaves is also another good tool to identification.

The following sheets and keys contain pictures of animals commonly found in our wildlife pond. It may be useful to also bring a field guide like the FSC guide to aquatic invertebrates as well.

The colour of the animals on the sheets is generally accurate but many animals can be differently coloured from what is showed depending on the time of year, stage in their lifecycle and individual variation.

Identification sheet 1 is suitable for foundation and key stage 1/2.

Identification sheet 2 contains more detail about the animals and is suitable for upper key stage 2.

The key serves as a basic introduction to a branching database or a dichotomous key for key stage 2.

Illustra-

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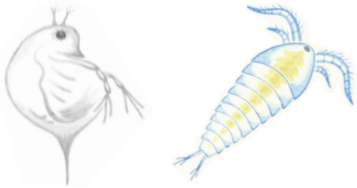
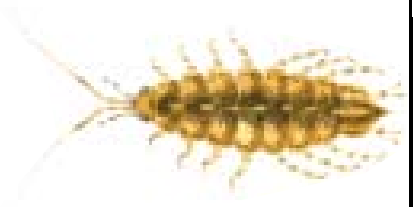
Pond Animals

Water fleas (very small)  Daphnia Cyclops	**Freshwater hoglouse** 	**Freshwater shrimp**
Diving beetle 	**Water boatman** 	**Pond skater**
Dragonfly nymph 	**Damselfly nymph** 	**Mayfly nymph**
Mosquito larva 	**Midge larva** 	**Flatworm**
Tadpoles 	**Newt** 	**Leech**
Pond snail 	**Ramshorn snail** 	**Pea mussel**

Illustrations by Graham Giddens © RBKC Ecology Service

Pond Animals

Bugs

Lesser Water boatman

h — 5-40 mm

Greater Water boatman

5-40mm — c

Water Scorpion

c — 15-25 mm

Beetle

Diving beetle

25-40 mm — c

Diving beetle Larva

25-60 mm — c

Leech

c, p

Up to50 mm

Amphibians

Tadpole

h

Up to 50 mm

Newt

Males are spotted, females are brown.

9-15 cm

c

Other

Flatworm

c — 5-15 mm

Water Mite

c — 8-15 mm

15

KEY

c : carnivore
h : herbivore
d : detritivore/scavenger
p : parasite

Size:

Pond Animals

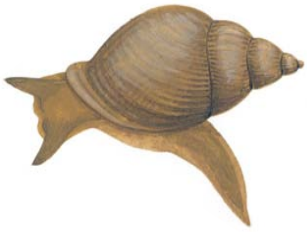
Shells

Pea mussel

h

2-7 mm

Pond snail



h

20-40 mm

Ramshorn snail

h

5-30 mm

Crustaceans

Water fleas (very small)

h

0.5-2 mm

Freshwater shrimp

d

15-30 mm

Freshwater hoglouse

d

5-15 mm

Larvae (immature insects not resembling adults)

Mosquito larva

h

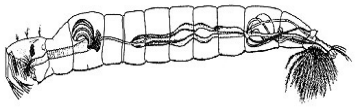
2-10 mm

Midge larva

h

Up to15 mm

Phantom Midge larva



c

5-25 mm

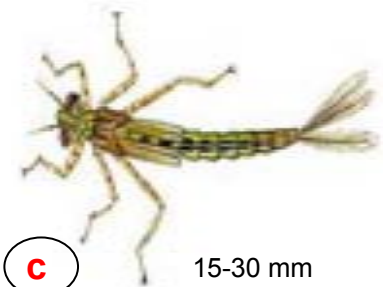
Nymphs (immature insects resembling adults)

Dragonfly nymph

c

Up to 60 mm

Damselfly nymph



c

15-30 mm

Mayfly nymph

h

Up to 20mm

Pond Invertebrate Key

Holland Park Ecology Centre

START HERE

Is it really small (less than 2mm)?

YES → Water fleas OR Daphnia / Cyclops

NO

Does it have legs?

NO → Does it have a shell?

NO → Is it living at the bottom of the tray?

YES → Leech

NO → Midge larva

YES → Pond snail

YES → Ramshorn snail OR

Does it have 6 legs?

NO → Freshwater shrimp OR Freshwater hoglouse

YES → Water boatman

Does live on the surface of the water?

YES → Pond skater

NO → Are a pair of legs much larger than the rest?

YES → Diving beetle

NO

Does it have a tail?

NO → Is its body large and broad?

YES → Dragonfly nymph

NO → Mayfly nymph

YES → Does it have 3 tails?

YES → Water Scorpion

NO → Beetle larva OR

YES → Does it have large eyes ?

NO → Damselfly nymph

Illustrations by Graham Giddens © RBKC Ecology Service

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Name:

Pond Dipping

Keep a tally of the creatures that you find.

Pond Animal	Tally	Total
Mayfly nymph	𝍸 III	8

POND ANIMALS

Name:	Date:

Draw four of the animals that you have found and name them. If time write a few sentences about their colour, how they move and what you think they might eat.

POND ANIMALS WORKSHEET

Name:	Date:

There are many types of invertebrates. Some have no legs, some have 6 legs and some have many legs. This can be very helpful in identifying the animals that you find.

1) When you have caught some animals look at each animal closely and try to identify them using the number of legs to help you. Then fill in the table

Name of creature	No legs	Six legs	More than six legs	Number found
Pond Snail				
Water Flea				
Leech				
Water Boatman				
Water Louse				
Tadpole				
Freshwater Shrimp				
Pea Mussel				
Mayfly Nymph				
Dragonfly Nymph				
Bloodworm				
Flatworm				
Water Mite				

2) Which creature have you caught the most of?

If time draw a picture of your favourite pond invertebrate on the back of this sheet

Pond Food Chains

All animals and plants need food to grow and move.

Animals that eat plants are called **herbivores**.

Animals that eat other animals are called **carnivores**.

Animals that eat both plants and animals are called **omnivores**.

1) When you have caught some minibeasts look at each animal closely. Fill in the table below.

Name of minibeast	Herbivore	Carnivore	Omnivore	Number of each creature found
Pond Snail				
Water Flea				
Leech				
Water Boatman				
Water Louse				
Tadpole				
Freshwater Shrimp				
Pea Mussel				
Mayfly Nymph				
Dragonfly Nymph				
Bloodworm				
Flatworm				
Water Mite				

2) Which animals did you find the most of? Why do you think there are so many of this animal?

_____

_____

_____

All animals and plants depend on each other for food and these relationships are called **Food Chains** or **Food Webs**.

3) Fill in the spaces in the Pond **Food Chain** that is drawn below.

Water fleas eats the pondweed ⇨ Dragonfly nymph eats the _ _ _ ⇨ _ _ _ eats the Dragonfly nymph

4) Draw a **food chain** using of one or more of the pond minibeasts that you have found. You can use larger animals such as frogs or birds in your food chain if you need to but you must use at least one minibeast.

Glossary

producers, consumers, herbivore, carnivore, omnivore, detritivore, adaptation, trophic level

Further Reading

Beebee, T. (1992) *Pond Life*. Whittet.

Fitter, R. and Manuel, R. (1994) *Collins Photo Guide - Lakes, Rivers, Streams and Ponds of Britain and NW Europe*. Collins.

Bebbington, K. and Orton, R. (1995) *The Freshwater Name Trail*. Field Studies Council.

Bernard, G., Coldfrey, J. and Thompson, G. (1984) *The Pond*. OSF.

Letter to read to class
Suitable for key stage 1 and lower key stage 2

Dear Class,

We are happy to hear that you are coming to Holland Park Ecology centre to study **habitats.** The two we have in our wildlife area are a woodland and a pond. Can you think of some features each of these habitats?

At the pond, you will have the chance to do pond dipping, have you ever done that before and can you think of ways or instructions we will need to follow to keep everyone safe and happy by the pond? What creatures might live in our pond? If you are coming in spring you should catch some tadpoles and maybe newts. Do you know what type of animal these are and what the **lifecycle** of them? Many other creatures only live part of their lives in the pond – have you ever heard of **nymphs** and **larvae**?

In the woodlands you will be hunting for **invertebrates** or minibeasts. Can you think why we will use spoons to pick them up? All sorts of invertebrates are adapted to live in different parts of the woodland. Some are **herbivores** or primary consumers; some are **predators** or **carnivores** whilst others eat dead plants and are called **detritivores**. Can you think of examples of each?

Invertebrates came in all shapes and sizes and can be classify into groups by things like number of legs and size. Do you know any creatures that have no legs, six legs or many legs? We will use identification sheets and **keys** to work out what they are.

After looking at our finds we will let them go and head back to the centre to wash our hands (why?). Hopefully by the end of the session you find lots of creatures and learn about all the things they need to thrive in their habitat. Maybe you will have gained some ideas on how to improve your school grounds for wildlife.

We look forward to seeing you all.

Best wishes from the Holland Park Ecology Team