



**Learning Rooms™**

Findel and Gratnells, working together to advance education.



## Pond Dipping – Teacher Pack

This 'Pond Dipping' kit can be used to do just that, or more accurately, in line with a freshwater invertebrate survey of ponds and small streams, and for pond/stream water sampling by a class of school children, led by a teacher. The equipment is suitable for use across a range of habitat areas.

In this teacher pack you will find the following resources to ensure optimum use of the kit equipment, and best possible learning outcomes for your pupils:

- Full experiment methodology
- Suggested adaptations for age and ability
- Example risk assessment
- National Curriculum links
- Suggested follow-up activities

This kit and associated methodology has been developed and refined over a number of years, and has been tested by thousands of school children and hundreds of teachers, both in school settings and fieldwork locations. The equipment included has been specially selected to be robust, good value and fit for purpose.



Item	Item name	Number	For class of 30	Notes
1	Pond Net	1 between 3	10	
2	Gratnells Observation Tray	1 between 3	10	
3	Plastic Spoon	1 each	30	
4	Observation Dish	1 each	30	
5	Hand Lens	2 between 3	20	
6	Pond Invertebrate ID Dial/Sheet	1 between 3 plus one for teacher	11	Download the ID Dial and ID Sheet <a href="#">here</a> .
7	Universal Tube with lid	1 between 2	15	
8	Gratnells SmartCase	1 between 6	5	
9	An established pond		1	

## Pond Dipping Primary National Curriculum Links

KS1	Working scientifically
Year 1	Animals, including humans
Year 1	Seasonal change
Year 2	Living things and their habitats
Year 2	Animals, including humans
Lower KS2	Working scientifically
Year 3	Animals, including humans
Year 4	Living things and their habitats
Year 4	Animals, including humans
Upper KS2	Working scientifically
Year 5	Living things and their habitats
Year 6	Living things and their habitats
Year 6	Evolution and inheritance

## Pond Creation and Maintenance

See [Learning Rooms Module 3](#) for pond creation guidance, planting plans and maintenance tips.

## Pond Dipping Lesson Plan – can be carried out within a 1 hour lesson (excluding preparation)

### Preparation

- Well in advance of your lesson, print, cut out and laminate the free downloadable **Pond Invertebrate ID Dial and/or Sheet**, and select or design a recording sheet/card (examples shown at the end of this guide) suitable for the age and ability of your pupils.
- You could expand the activity to investigate the effect that time of year/seasonal changes have, depth of sample or temperature of the water on the species found, or do a comparison of the species found in two different ponds.
- On the day, before the students arrive, fill the observation trays with pond water to a few centimetres deep, and spread them out around your pond, at least 3 metres away from the water's edge.
- Split the students into groups of three, two groups (totalling six students) share one SmartCase.
- **Top Tip!** Have a couple of spare buckets (not included in the kit) of fresh pond water saved to one side in case their observation trays need refreshing mid-activity because they have mistakenly scooped up pond mud while dipping.
- See the [example risk assessment](#) provided for things to consider before undertaking outdoor activities. **Please note, the example risk assessment is provided as a guide only and should not replace that which you will create yourself for your own site, students and activities and taking account of the prevailing weather conditions.**

## Introduction and Demonstration (10 minutes)

Start by explaining that during the activity session, you and your students are going to survey the pond creatures (if appropriate for age/ability, refer to them as 'pond invertebrates', i.e. creatures with no backbone) in their natural habitat. A couple of questions to ask as part of your introduction could be;

### What is a habitat?

The place where any animal lives is known as a habitat, and different sorts of animals live in different habitats. Habitats can be very big, like the arctic habitats where polar bears live, or very small such as between two blades of grass where a money spider might make its web. Remember, a habitat is just the place where the animal lives. Your house is your habitat!

### This pond will be a habitat for many invertebrates and possibly some larger animals. Can you think what animals we might find?

Fish, ducks, frogs etc. Depending on their level of advance knowledge, students may name some invertebrate examples.

### Older/higher ability students –

#### How are these animals adapted to life in the pond?

Gills, streamlining, hairy leg paddles, webbed feet, air bubbles/sacs, siphons that work like snorkels and use of surface tension are all examples of adaptations to life on or in water.

## Teacher Demonstration

- When the students arrive, carrying their SmartCases and equipment, they should place their pond nets next to the observation trays along with the observation dishes, plastic spoons and ID guides.
- Ask them to stand in their groups of three, behind the equipment and facing the pond. This keeps them away from the water's edge until you have carried out the introduction.
- Stand between the students and the water.
- Stay Safe! Students should not fill or empty the observation trays at the pond edge themselves, you or other supervising adults should do it for them as it risks the students falling into the water.
- Approach the edge of the pond and demonstrate the pond dipping method; demonstrate how to dip with the nets, **standing sideways to the water with both knees bent**. Ask all the children to practice this position where they currently stand, and emphasise that standing face on to the pond makes it easy to lose balance and fall in.
- Dip the net just below the surface and avoid any bottom mud. Explain that they if they get lots of mud by accident they should put it straight back in the pond and not in their observation trays, or they won't be able to see any creatures. It is important not to put the net in too deep for this reason.
- Move the net in long sweeps along the pond edge, not necessarily avoiding reeds and vegetation as many creatures like to hide here. Explain this to students, and also that invertebrates are not usually swimming out in the open water in the middle, so there is no need at all to lean out over the water – plus it's very dangerous.
- Empty your net out carefully by turning it inside out into one of the observation trays. **Important! Students must keep the time the net is out of the water to a minimum. Move it from the pond to the tray as quickly as possible so that any animals caught aren't harmed.**
- To begin observation, students they must allow the water to go still, that way the moving invertebrates will be easier to spot.



- If you do spot something, scoop some water into one of the observation dishes and transfer the invertebrate to the dish using the plastic spoon. Do this gently, don't tip the creatures in from height as it may harm them.
- Demonstrate the use of the ID Guide.
- Tell students that any creatures they find should be identified and then recorded. Show them a data sheet or tick card and if necessary, describe what they should write on it.
- **Optional** - once identified, the invertebrates in the observation dishes could be emptied into a class/communal observation tray for reference by the teacher later on.
- Tell the students that they should not put their hands in their mouths during this activity.

### Activity (30 minutes)

- Working in groups of three to an observation tray, the students should show you the 'sideways on, knees bent' position once more, before starting the activity. They can take it in turns to approach the pond and do a sweep with the net as you demonstrated. Once they have emptied the net into the tray, the next student can take the net and repeat the process. The first student can start looking in the tray and separating and identifying the creatures while the other dips. Repeat again for the third student so the whole group has a turn.
- While the students are dipping, always stand facing them and the water's edge, i.e. never crouch down with your back to the water while looking into an observation tray. Move between the groups, checking on them as necessary. They should not be dipping for a second time until all the creatures in their trays have been separated and identified. Approximately 80% of their time will be spent at the observation tray and only 20% by the water.
- Help to identify any creatures they find by encouraging them to find it on the ID Guide themselves and read all of the information. Groups should complete their recording sheet (select recording method appropriate to the age and ability of the students) as they go along. If you are using a class observation tray for follow-up work later on, once the creatures are identified and recorded, they can be transferred to this.
- After 20-30 minutes of work, ask students to ensure their nets are clean and not full of plant material or mud. They should complete their final separation, ID and recording before emptying their separation dishes back into their observation trays and packing up their equipment.
- Students should collect a small sample of pond water in the lidded tubes to take back to the classroom, if you wish to carry out the follow-up activity looking for microscopic pond life. Supervise them carefully while they do this. To increase your chances of capturing some microorganisms, squeeze the water from water plants into the tube or gently scrape the green or brown growth from plants/pond liner.

### Review (10 minutes)

- If you have used one, gather the children around the class observation tray in a large circle (use the pond nets to form a circle on the ground if needed) to look at any interesting finds or good examples and to test their identification skills. You could discuss how finding lots of different invertebrates is a sign of a healthy pond. While you are doing this, if you have an extra adult with you, they should empty the observation trays carefully back into the pond, again not from a height so as to keep the animals safe.
- Finally, empty the class observation tray back into the pond carefully, if you've used one (you might want to take a picture of it first).

## Suggested Follow-up Activities

### Microscopic pond life

To observe pond creatures often found at the bottom of the food chain and too small to see with the naked eye, take the samples of pond water collected at the end of the activity back into the classroom and allow them to settle. Using your microscopy equipment (not provided) use a plastic dropper or pipette to collect a small amount from the bottom of the tube, and place it into the centre of a well slide. Add a cover slip and place under a microscope. Look out for green algae, worms and hydra. For a useful ID guide to microscopic life, click [here](#).

### Food chains/web

Initiate further discussions about pond food chains/webs now or as a follow up in a later lesson. Students could research what the invertebrates eat, and what they are eaten by, identifying which animals are carnivores, herbivores and omnivores.

### Life cycles

Frog, dragonfly, damselfly and mosquito lifecycles could be further explored depending on which of these animals you find in your pond.

### Movement

From their observations, ask the children to act out the way the pond creature's move. Many pond creatures have distinct ways of moving e.g. leech - extends and contracts, water boatman - swims using led paddles, worms - wiggle. This could be carried out in a P.E. or swimming lesson.

### National projects

You could take part in the **OPAL Water Survey**, the '**Big Spawn Count**' or the '**Big Pond Dip**'

## Recording Sheets

Great for younger students. You could create your own with the creatures common to your minibeast areas and add pictures to aid identification/recording.

### Minibeast Hunt Tick Card

<input type="checkbox"/> Lesser Water Boatman	<input type="checkbox"/> Leech
<input type="checkbox"/> Freshwater Shrimp	<input type="checkbox"/> Pond Snail
<input type="checkbox"/> Mayfly Nymph	<input type="checkbox"/> Others.....
<input type="checkbox"/> Water Hog Louse	<input type="checkbox"/>

## Example ID Recording Sheets

Great for older students. You could create your own to obtain the data you need for post-activity analysis and development of specific numeracy skills or for follow up work on adaptation.

Your name(s): \_\_\_\_\_ Date: \_\_\_\_\_

SPECIES	TALLY	TOTAL	INTERESTING FEATURES	WHAT IT EATS
Worm				
Water Hog Louse				
Water Snail				
Water Beetle				
Lesser Water Boatman				
Freshwater Shrimp				
Damselfly Nymph				
Mayfly Nymph				
Cased Caddis Larva				
Tadpole				