

Habitats



Activity Pack



Linnean*Learning*

HABITATS

Linnean Loan Kits

Incorporating practical activity into science lessons can be tricky at a primary level, particularly for non-specialist teachers. A recent SCORE (Science Community Representing Education) report also found that many schools lack sufficient resources for teaching practical science. These loan kits not only provide some of the equipment necessary for practical lessons, but also contain ideas and guidance for teachers - we hope you find them useful!

The activities suggested in the packs are by no means an exhaustive list of the possible lessons you could carry out using the kit provided. We have tried to provide a variety of indoor and outdoor practical activities, suitable for pupils in Key Stages 1&2. Many of the activities are cross-curricular, providing opportunities to develop skills in literacy, mathematics, art and ICT.

If you have an idea for using the equipment in this kit, we would love to hear about it! Included in the loan kit is a small notebook in which you can share top tips, ideas and activities which worked particularly well for your class. If you'd like your idea added to this printed activity pack then full credit will of course be given to you. Email us with your suggestions: education@linnean.org

Please check our website for full details of other kits, covering topics such as classification, life cycles and plants.



Disclaimer: The Linnean Society is pleased to lend these kits to schools, and believes each kit to be suitable for its suggested use. However, we recommend that teachers thoroughly examine and check each kit to make sure it is fit for the purpose intended, making any risk assessment that is appropriate. The Linnean Society excludes any liability for injury or damage howsoever caused by the use of the kits, is not responsible for the standard of development or safety of any of the products used in the kits, and makes no warranty against errors and omissions in any kit or accompanying material.

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Learning Objectives & Curriculum Links

The activities in this pack encourage students to:

- Observe and recognise some simple characteristics of a variety of living things
- Develop curiosity and interest by exploring their surroundings using their senses
- Treat animals in the environment with care and sensitivity
- Work together in pairs or groups, taking turns and sharing fairly
- Communicate through conversation by sharing experiences, ideas and information
- Develop scientific and research skills, either individually or in groups

We've designed the pack to help teachers cover the following curriculum areas:

Year 2

- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
- Identify and name a variety of plants and animals in their habitats, including micro-habitats.
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- Find out and describe the basic needs of animals, including humans, for survival (water, food and air).

Year 4

- Recognise that environments can change and that this can sometimes pose dangers to living things.
- Construct and interpret a variety of food chains, identifying producers, predators and prey.

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What's In The Kit...

4 Woodlice choice chambers



4 Quadrats

1 Frisbee

3 Sets Food Chain Dominoes (20 per set)



2 Sets Wildlife Friend or Foe Cards (16 per set)

4 Habitat Identification Keys



5 Bug Viewers

4 Magnifying Glasses

6 Pairs Binoculars



1 Soil Moisture Meter

1 In-Out Thermometer

1 Lux Meter

1 Inflatable Globe



2 Sets Is This My Home Mats & Cards
(9 mats & 54 cards per set)

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Activity Ideas



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Woodlouse Wonderland - Stage 1

Activity:

Students will create a mini-habitat to house woodlice, ensuring that the environment is suitable for woodlice survival. Students can then utilise these woodlice in a variety of experiments, or simply study them at close range.

Students will need:

Plastic container - ice cream tub with lid or similar is ideal
Soil, twigs and leaves
Small stones
Woodlice

What to do:

Prepare the plastic container for your woodlice. Punch several small holes into the lid of the box to allow air circulation. Woodlice prefer the dark, so either avoid transparent containers or keep the box in a dark cupboard as much as possible. The container should have moist soil, twigs and leaf litter in place for the woodlice to hide amongst.

Try gathering woodlice from under stones and among leaf litter. Use a paintbrush or teaspoon to gently collect the woodlice, and place them into your box. Disturb the woodlice as little as possible while collecting them. Alternatively you could put your box outside under stones and leaf debris and wait for it to be colonised naturally. You'll need 8-10 woodlice per group of students. It's important that you don't stress the woodlice, and that each group uses the same woodlice for each experiment, so you may wish to prepare several small boxes.

Once you have some woodlice living in your container, keep the soil moist but not waterlogged. Add stones, bark or rotting wood - the woodlice will colonise these areas. Add food at intervals - potato, carrot or other root vegetables. If you plan to keep your woodlice in the classroom for several days you should also add a lump of cuttlefish or natural chalk to supply calcium carbonate. Don't use blackboard chalk!

Tips for teachers:

You'll need to introduce the woodlice to the students and remind them that these are not merely animals to be used in a science experiment, but living creatures which deserve respect. Animals should be returned to your boxed mini-habitat or outdoors to their natural habitat as soon as possible after concluding your investigations.

Remind students that they should disturb the animals as little as possible during the experiment, and be gentle with them at all times.

Students should wash their hands before and after handling woodlice.

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Woodlouse Wonderland - Stage 2

Activity:

Students will study the preferred environmental conditions of woodlice using a choice chamber. From their experiments students should be able to design an ideal habitat for their woodlice.

Students will need:

Choice chamber (one per group)
Soil, twigs and leaves
Small stones
Woodlice

What to do:

A choice chamber is an ideal way to study the behavioural responses of woodlice to varying environmental conditions. Each chamber has sections in which environmental conditions can be altered to give woodlice (or other small invertebrates) up to four areas to move between. Some possible combinations are light and dark, damp and dry or leaf litter and stones. You can also combine these conditions to give the woodlice four choices (wet-dark, wet-light, dry-dark and dry-light for example).

First you need to decide what you want to find out from your experiment - for example, your question could be 'do woodlice prefer dark or light areas?' Set up your choice chamber to the conditions you wish to study. You could cover one side with black paper to make it dark, leaving the other side open to keep it light. Remember to keep your experiment simple - don't change too many variables at the same time.

To make your experiment fair you should use the same woodlice, repeat the experiment several times and give the woodlice the same period of time to adjust to the conditions in each experiment. Before starting your study you should make a hypothesis - this is your prediction of what will happen in the experiment.

When you are ready to start, add some woodlice to each section of the choice chamber, disturbing them as little as possible - if you introduce them to only one section you may influence your investigation. Once the woodlice are safely in the choice chamber you should give them a few minutes to adjust, and then count how many woodlice have gone into each area of the choice chamber. Record your results every five minutes for fifteen minutes. Then return the woodlice to their mini-habitat.

Change the conditions in your choice chamber. This time you may wish to study whether woodlice prefer dry or damp conditions. Keep all other variables the same. While you are changing your conditions, allow the woodlice to rest for five to ten minutes - use this time to write up your observations.

REMEMBER: As soon as you are finished with all of your experiments you should return the woodlice to the place you originally found them, disturbing them as little as possible during the process.

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Sampling Made Simple

Activity:

Students will use a quadrat to carry out a sampling activity, then estimate the species abundance within the school grounds.

Students will need:

Quadrats - you'll need to assemble these before use
Notebook and pencil
Camera (optional)
Habitat Identification Keys
Frisbee

Background information:

When a scientist wants to know how many organisms there are in a particular habitat, it is not always possible to count them all. Instead, he or she will count a smaller section of the population – a sample. A quadrat is used to isolate a sample (usually 1m^2 or 0.25m^2). It is ideal for sampling plants, or occasionally slow-moving animals such as snails.

Random sampling is usually carried out when the area you are studying is very large, you have limited time, or the area is fairly uniform. It is important that sampling in an area is carried out at random, to avoid bias. For example, if you were sampling the number of daisies in your school playing field, but only took samples from near the fence, you wouldn't have a sample that is representative of the whole field.

What to do:

The simplest form of sampling is to gently throw a Frisbee, then place the quadrat where it lands. This is not usually suitable for a rigorous scientific study, as a personal element enters the throwing and it is not truly random, but it's great for learning to use a quadrat and practicing fieldwork skills.

Head out to the school grounds or a local park and find a clear spot. Students should take turns to gently throw the Frisbee and place the quadrats, then use the field guides or ID charts to identify the species within each quadrat area. Recording the species found will allow comparisons to be made across the sample sites. Ensure that you take plenty of samples across the area you're working in to gain an accurate representation of the environment.

Take it further:

Use the data gathered to create a species map of the environment that you were sampling. You could illustrate this, or use a diagrammatic key. Display the map on the classroom wall, and add to it after each sampling session.

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Pitfalls Of Nature

Activity:

Students will set up a pitfall trap and monitor the contents, identifying the species that are captured.

Students will need:

Trowel
Coffee tin with plastic lid
Four similar sized rocks
A piece of board or slate 6-10cm larger than the coffee tin
Habitat Identification Keys

What to do:

A pitfall trap is a simple method for catching ground dwelling insects such as beetles and woodlice. Pitfall traps are easy to build and maintain - you can make one in under half an hour.

Dig a hole the size of the coffee can, making sure the can fits neatly into the hole - you may need to adjust the depth of the hole until it is snug. Once the can is in place, place the four rocks around it and balance the board or slate on top. This will provide a dark space, protected from rain and debris which will attract ground dwelling insects.

Check the pitfall trap at least every 24 hours, removing any insects you find there. You can keep the insects to study in a damp dark environment, or release them into their natural habitat. Try using an identification key to work out which species have fallen into your trap.

If heavy rain is forecast, or you will be unable to attend to your pitfall trap you should put the lid on the coffee can. Always remember to treat insects carefully - you don't want to harm them. Once you have finished your study remove the pitfall trap.

Take it further:

- Set up a range of pitfall traps around the school grounds - if possible, try to put them in a variety of habitats: under a tree, at the edge of the playing field and in a planter or flower bed.
- Use the data from monitoring your pitfall trap(s) to produce a graph showing the species that you collected.
- Produce a collage to illustrate the range of insects found in your pitfall traps.

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Food Chain Dominoes

Activity:

Students will play a game of dominoes while building food chains and webs.

Students will need:

Food Chain Dominoes Cards

What to do:

Each domino card shows an animal on the left and the name of the animal's favourite food on the right. You can use the cards by yourself to create food chains and webs or work in groups to play a game of dominoes.

Distribute the domino cards equally between players - you need two or more people to play. The first player chooses any card from their hand and lays it on the table. The next player has to match one of their domino cards to either end of the first card. Domino cards in play can be used more than once if another pupil has a card that can be linked to them. You take turns to lay the dominoes, building a food web as the game progresses. The **plant** or **detritus** cards will always form the start of a food chain.

If you cannot play any of your cards you miss a turn. The winner is the first player to lay all of their domino cards.

When the game is completed, why not try to draw or photograph the food chains and webs they have created.

Take it further:

- Design your own food-chain dominoes. You could specify a habitat that the everyone's animals should come from. You may need to carry out some research into the eating habits of the animals you have selected to ensure that the game can be played properly.

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My Creature Is...

Activity:

Students will either study an animal or design a new creature, particularly thinking about the various characteristics and adaptations needed to survive in the animal's habitat.

Students will need:

A copy of the 'My creature is...' worksheet - provided at the end of this pack
Pen or pencil
Colouring pens or pencils

What to do:

For a real animal:

Students may wish to first discuss the characteristics and adaptations of a range of animals that they are familiar with. Remind them to pay attention to what the animals eat, how they move, and whether they are predators or prey.

Next, each student should select an animal and draw it in the box in the middle of their worksheet (alternatively they could stick in a printed image of the animal). Younger students may wish to use a family pet as the focus of the worksheet.

For an imaginary creature:

Students must first imagine their animal, paying particular attention to what it looks like, where it lives, what it eats and how it moves. Then they should give the animal a descriptive name and draw it in the box in the middle of their worksheet.

For both:

The boxes around the sheet contain a series of questions that students should try to answer. This may require some research, depending on the animal they have chosen.

Once the sheets are completed try to group the various creatures together based on their characteristics and the habitats they live in - do the creatures always fall into similar groups? This could spark an interesting discussion about common adaptations to specific habitats.

Take it further:

Create a wall display showcasing the student's creature creations - perhaps you could arrange it as a world map, with each creature in an appropriate area of the world.

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Wildlife Friend Or Foe?

Activity:

Students will work as a group to decide whether each of the habitats shown are wildlife friendly, and discuss what changes could be made to the habitats in order to encourage wildlife to visit each site.

Students will need:

A set of Wildlife Friend or Foe cards
Paper and pencil
Camera (optional)

What to do:

Divide the cards among the students. Encourage student to discuss how wildlife friendly each habitat could be - do they think wild animals would visit the site? Students may want to jot down some ideas about why each habitat is suitable or not. Remember that wildlife comes in all shapes and sizes!

Once they've discussed the habitats, students have to decide which of three categories to place their card into - Always Friendly, Sometimes Friendly and Never Friendly. Divide the paper into three columns and write one of the categories at the top of each column. Ask students to place their cards into the appropriate column, based on their wildlife friendliness. You could photograph the layout to review later.

As a class, look at the habitats that have been placed into each category. Try ranking the habitats in each column from most to least wildlife friendly.

Can you think of some improvements that could be made at each 'Sometimes Friendly' habitat to encourage wildlife to visit? What about:

- Planting a greater range of flowers
- Clearing up rubbish - plastics are particularly dangerous to wildlife
- Putting out food for wild animals

Take it further:

Have a wander around the school grounds and see if there are any improvements that could be made to encourage wildlife to visit.

Notes: Cards included are: pond, car park, garden, field, forest, rubbish bin, log pile, bird box, bushes, classroom, football pitch, playground, bird table, vegetable garden, hedge, food scraps bin

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Animal Adventures

Activity:

Students will carry out an animal hunt around their school grounds or in the local park and measure a variety of environmental conditions that may influence the creatures that they find.

Students will need:

Magnifying glasses
Bug viewers
Large tray or large sheet (white is best)
Binoculars
Habitat Identification Keys
Lux Meter
Soil Moisture Meter
In-Out Thermometer
Map or outline plan of area to be surveyed
Pencils

What to do:

Head into the school grounds or the local park and go on an animal adventure. Search for as many animals as you can find - you'll likely spot lots of minibeasts, a few birds and squirrels (depending on your location) and the odd domestic cat or dog. Encourage students to mark on a map or outline plan where they have found each animal. Remember that not all animals are obvious to begin with - students may have to gently shake branches over a tray or sheet and then identify the animals that are shaken free. Use the light and moisture meters to measure and record environmental conditions around the survey area.

Once you're back in the classroom, take some time to analyse the results of your survey. Are there any obvious trends? Did you find species you did not expect? Is there a link between the environmental conditions and the animals found in each microhabitat?

Take it further:

Keep track of the changing outdoor environment by repeating your survey in all four seasons. Make sure you sample at the same sites, around the same time of day and using the same methodology.

Alternatively, why not sample two very different locations - a beach and a garden for example. Encourage the students to use the environmental data as a basis for discussing why animals are found in one habitat or another. Is there an obvious difference in the type of creatures you have found?

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Bird Feeder

Activity:

Students will make simple bird feeder blocks to hang in the school grounds, then monitor the bird species which come to eat there.

NUT ALLERGIES: If you have children with nut allergies ensure they do not handle the bird cake mixture. Alternatively, you could alter the mix to avoid nuts - you'll also need to check the bird seed that you use, just in case.

Students will need:

Yoghurt pot - one per pair or group
String
Scissors
Good quality bird seed
Raisins
Peanuts
Grated cheese (optional)
Suet or lard
Mixing bowl

What to do:

Carefully make a small hole in the bottom of the yoghurt pot using the scissors - you may wish to do this in advance for younger students. Make a loop of string and push it through the hole, tying a large knot on the inside of the pot. Make sure the loop is big enough to hang your bird feeder.

Allow the lard to warm up to room temperature, but don't let it melt. Cut it into small pieces and put it into the mixing bowl. Add the other ingredients a bit at a time, and mix them together with your fingers. Keep adding the seed/raisin/cheese mix and squish it until the lard holds it all together.

Fill the yoghurt pots with the bird cake mix, and put them in the fridge to set for an hour or so. Once they've set, hang the feeders from a tree, fence or bird table in the school grounds - keep the yoghurt pots attached.

Take it further:

Keep a tally of the birds that come to visit your feeders. You'll need to set aside 10-15 minutes on several consecutive days to identify and record the birds. You may wish to take some photos of the birds at the feeder and identify them back in the classroom using a field guide.

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Squirrel Cones

Activity:

Students will make a squirrel feeding cone, then hang it and monitor the number of squirrels it attracts.

NUT ALLERGIES: If you have children with nut allergies ensure they do not handle the squirrel cone mixture - we would suggest avoiding this activity altogether.

Students will need:

A pine cone (one per pair or group)
Lard or shortening
Chunky peanut butter
Oats
Crushed peanuts
String

What to do:

Ensure that the pinecone is free of any loose dirt or debris, and that it is completely dry. You may wish to leave the cones near a radiator for a few days to dry them out entirely.

Allow the lard or shortening to warm to room temperature, and mix it with the peanut butter. Spread this mixture all over the pine cone, making sure that you get it in between the cone scales. The mixture will act as a glue, but is also attractive to squirrels as it is.

Once the cone is well covered with the peanut butter 'glue', roll the cone in a mixture of oats and crushed nuts. Use your fingers to press the oats and nuts into the peanut butter layer. Now you have a squirrel feeder!

Allow the cone to dry slightly, then use a piece of string to hang it from a tree or bush in the school grounds - preferably in clear view of a window.

Take it further:

Set aside a few minutes each day to observe and record the number of squirrels visiting your feeder - it's easiest to do this from inside the building, so you disturb the feeding animals as little as possible.

Tips for teachers:

Most areas of the UK have a squirrel population, aside from the very North-West Highlands of Scotland and a few parts of the Midlands. Before starting this activity, check that you have squirrels in or near to the school grounds!

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Best Nests

Activity:

Pairs of students will take part in a nest building competition from materials found around the school grounds, then test the nests for strength and weatherproofing.

Students will need:

Pot of clay or playdough

Watering can, strong fan, camera (all optional)

Access to an outdoor space for collecting nest building material - leaves, twigs, feathers, grass etc. If you do not have access to an outdoor area, provide these materials for your students

What to do:

Have a discussion about the kinds of materials that birds use to build their nests - if possible go outside and have a look at some real nests.

Go out into the school grounds and look for material you can use to make your nests - you can be as creative as possible, and don't feel restricted to only natural materials.

Work in pairs, using the materials you've collected to build a nest. If you're finding things tricky you can use modelling clay or playdough as a kind of glue. Younger students may wish to start off by creating a small clay bowl as a base for their nest.

Have a discussion about which looks most like a real bird nest - you could also take some photos of the finished nests to display.

Now it's time to test the nests! Are they windproof? Use a strong fan to test each nest in turn - can they all withstand the force of the fan? How about checking the nests rain-resisting abilities? Try using a watering can to (gently) pour water over the nest - does it fall apart or become waterlogged?

Take it further:

For a real challenge try building your nests using chopsticks, pegs or tweezers as 'beaks'. You should collect the nesting material, and carry out all of the building without using your hands.

Health & safety:

Ensure that students wash their hands before and after the nest building, particularly if they've been collecting material out of doors.

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Is This My Home?

Activity:

Students will play a matching game, deciding which animals live in which habitat.

Students will need:

Is This My Home Mats & Cards
Inflatable Globe (optional)

What to do:

Have a discussion about the various habitats found around the globe. You could use the inflatable globe for a starter activity. Throw the globe gently between students - as each student catches the ball they should shout either the continent or ocean under their left thumb, and an animal that might be found there.

Hand out the mats and cards. There are two sets of cards - one with pictures of each animal and one with the name of each animal. Try to match the animals to the correct habitat - can you match them all?

Take it further:

Design your own habitat mats and animal cards - carry out some research into unusual animals and their habitats, then test your classmates!

Notes:

Habitat mats:

forest, polar regions, African plains, pond, desert, garden, ocean, seashore, rainforest

Animal cards:

Pond skater, mouse, crab, lizard, butterfly, penguin, tree frog, squirrel, elephant, octopus, walrus, monkey, badger, parrot, giraffe, shark, frog, goldfish, camel, sparrow, starfish, sea gull, snail, snake, lion, whale, polar bear

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Pond Dipping

Activity:

Students will have the opportunity to hunt for minibeasts living in a pond, and may be able to identify these creatures. Ponds are fascinating, with many different plants and animals to be discovered. They are an endless source of interest for children, and a valuable resource for teaching about diversity, classification, life cycles and many other topics within the curriculum.

Students will need:

Pond net or fine kitchen sieve (don't use for food afterwards!)
Containers - old ice cream tubs or washing up bowls are ideal
Bug viewer or magnifying glass
Spoon or tea strainer
Pooter
Identification key
Sketchbook or camera

What to do:

Once you get to the pond half fill your containers with pond water and set them down well away from the edge of the pond. Use the net to sweep a figure of eight pattern in the water. Try to avoid the sediment at the bottom of the pond, and the weeds at the top, as these will make it difficult to find the minibeasts in your net! Try sheltered spots - near the edge for example - as these areas will have more bugs to find. Continue sweeping for 10-15 seconds, then bring the net out of the water and take it to your large container. Turn the net inside out into the water - you may need to swish the net under the water to remove particularly stubborn bugs!

Put the net to one side and begin to examine your catch. At this point you could use the spoons, pooter or tea strainer to move interesting minibeasts into your smaller container or bug viewer for further investigation. If you are planning to use these in the classroom remember to provide plenty of water and keep the bugs cool or they will die. Keep an eye out for carnivorous bugs in your selection – these should be housed individually or they will eat your catch. Identification can be carried out by the pond, using a field guide, identification key or chart. It can also be done later in the classroom using microscopes, magnifying glasses and some research.

Take it further:

There are many ways you can use your new found knowledge. If you ran your pond dipping as an experiment, students could now draw tables and charts, write reports and draw conclusions. Students may wish to make labelled sketches or drawings, or label photographs taken during the pond dip. Your class could investigate the food chains or life cycles of the minibeasts they found, carry out another dip in a different pond for a comparison or work on a science, art and writing project using their bugs.

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Pond Dipping

Tips for teachers:

For a successful pond dip you will need to make sure the students understand what is expected of them before you head to the pond. Familiarise them with the equipment, and get them thinking about what you might find. If you have time you could show a short video (try YouTube) or explain the techniques and get everyone to have a 'practice' session. You may wish students to wear disposable gloves whilst handling bugs and pond water - make sure you check for latex allergies first, or use latex free gloves. You'll need the smallest size you can find.

Have a go yourself before you try pond dipping with your students. This will allow you to get used to the technique, and you'll easily be able to help solve any problems that crop up on the day. Pond dipping is very exciting for young children. You might need to gently remind them to examine their catch rather than just playing by the pond! It is common for children to be carried away by large minibeasts that they find, often to the exclusion of smaller creatures that can be much more interesting. It is also likely that tree buds, catkins and the like will be incorrectly identified as minibeasts! It is worth factoring in enough time to look at what everyone else caught, or planning a follow up lesson for more in depth identification of your bugs.

Health and Safety:

Always ensure there is adequate supervision. A ratio of 1:6 is suggested for young children and a ratio of 1:10 for older children.

Before you go pond dipping you should ensure that students are suitably dressed for both the weather and the environment you will be taking them into. Sensible shoes are a must, as pond edges can be slippery and muddy - wellies or trainers are a safe bet. If it's really wet, consider some waterproof trousers or roll up trouser bottoms and tuck them into socks - not very stylish but students won't have wet trousers for the rest of the day.

Bring some towels just in case! Excited little ones may spill water from observation containers or splash in muddy puddles.

Pond dipping can be hazardous, but as long as you take care and explain these rules clearly to the students it should be a fun experience for all involved.

- **Don't fall in!** Students should kneel at the edge of the pond to dip their nets, and should move away from the edge to look at their specimens. No running or standing near the edge, and no messing about under any circumstances!
- **Don't get water in your mouth!** Pond water can carry a number of diseases, as well as containing many bugs and beasts. Everyone should keep hands away from mouths, eyes and noses until you have had a chance to wash your hands. Carry some alcohol based hand wash just in case.
- **Treat the animals with respect!** They can be very small and delicate, so handle them carefully. Don't pick them up with your fingers and return them safely to where they were found when you are finished.