Habitats
Activity Pack for Primary Teachers

Linnean Learning
Discovery 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 found that many schools lack sufficient resources for teaching practical science. These Discovery Kits not only provide some of the equipment necessary for practical lessons, but also provide 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! If you’d like your idea added to this activity pack then full credit will of course be given to you. Email us with your suggestions: learning@linnean.org.

Please check at our website for full details of other available kits, covering topics such as plants, life cycles, classification and evolution - www.linnean.org/discovery-kits.

Also! We love seeing your pictures. Tweet us @LinneanLearning #DiscoveryKits

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.
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.
What’s in the Kit?

4x Woodlice choice chambers

4x Quadrats

1x Frisbee

3x Food Chain Dominoes (20 per set)

2x Wildlife Friend or Foe Card Sets (16 per set)

4x Habitat Identification Keys

5x Bug Viewers

4x Magnifying Glasses

6x Binoculars

Soil Moisture Meter

In-Out Thermometer

Lux Meter

Inflatable Globe

2x Is This My Home Mats & Card Sets (9 mats & 54 cards per set)
Activity ideas

Woody wonderland 1 - Page 1
Create a home for some wild woodlice

Woody wonderland 2 - Page 2
Switch up the conditions and see where your woodlice go

Simple sampling - Page 3
Counting different species has never been so fun!

Pitfalls of nature - Page 4
See what creatures you can collect

Food chain dominoes - Page 5
Match up the predator to the prey

My creature is … - Page 6
Design a new creature, or study a real one

Wildlife friend or foe? - Page 7
Take a look at the environments around you

Animal adventure - Page 8
Step outside and see what you might find

Bird feeder - Page 9
Build a snack-shack for the birds

Squirrel cones - Page 10
Make some nutty nibbles for sneaky squirrels

Best nests - Page 11
Build the nest - better than the rest

Is this my home? - Page 12
Find out the habitats of different animals

Pond dipping - Page 13 & 14
Hunt for moist minibeats in your local pond
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.

Let’s go!

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!

Teacher tips:
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.

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

Woody wonderland 1

You need to provide:
Plastic container - ice cream tub with lid or similar is ideal
Soil, twigs and leaves
Small stones
Woodlice
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.

Let’s go!

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.

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.

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.

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 to return the woodlice back to the place you originally found them!
Students will use a quadrat to carry out a sampling activity, then estimate the species abundance within the school grounds.

Info:

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.

Let’s go!

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 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.

In the Kit:
Quadrats (you’ll need to assemble these before use)
Habitat Identification Keys

You need to provide:
Notebook and pencil
Camera (optional)
Frisbee

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

Let’s go!

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.

**In the Kit:**
Habitat Identification Keys

**You need to provide:**
Trowel
Coffee tin with plastic lid
Four similar sized rocks
A piece of board or slate 6-10cm larger than the coffee tin

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

Let’s go!

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.
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.

Let’s go!

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.

In the Kit:
A copy of the ‘My creature is…’ worksheet (provided)

You need to provide:
Pen or pencil
Colouring pens or pencils

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.
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.

Let’s go!

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.

**Note:** 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.
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.

Let's go!

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?

In the Kit:
- Magnifying glasses
- Bug viewers
- Habitat Identification Keys
- Binoculars
- Lux Meter
- Soil Moisture Meter
- In-Out Thermometer

You need to provide:
- Large tray or large sheet (white is best)
- Map or outline plan of area to be surveyed
- Pencils

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?
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.

**Let’s go!**

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.

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

**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.
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.

**Let’s go!**

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.

**Teacher tip:**

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!
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.

Let’s go!

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

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?

You need to provide:
- Pot of clay / 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

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

Let’s go!

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?

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.

In the Kit:
Is This My Home Mats & Cards
Inflatable Globe

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!
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.

Let’s go!

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. Sweep 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:
If you ran your pond dipping as an experiment, students could 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.
Teacher tips:
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! Kneel at the edge of the pond to dip nets, and move away from the edge to look at their specimens.
- Don’t get water in your mouth! Pond water can carry a number of diseases, as well as containing many bugs and beasties. Everyone should keep hands away from mouths, eyes and noses. Carry some alcohol based hand wash.
- Treat the animals with respect! They can be very small and delicate, so handle them carefully.
The Linnean Society of London

This education resource was developed by Linnean Learning, the Education Team at the Linnean Society of London. The Linnean Society is the oldest active biological society in the world. Founded in 1788, the Society continues to provide a forum for the discussion and the advancement of the life sciences.

Our name is taken from the Swedish naturalist Carl Linnaeus who helped to shape our understanding of the natural world through his work in taxonomy and classification of living things. We're proud of our unique collections and of our history. Did you know it was at a meeting of the Society in 1858 that Charles Darwin and Alfred Russel Wallace outlined the theory of evolution?

Linnean Learning is working hard to bring brilliant biology alive in the lives of people of all ages and walks of life. We'd love to hear from you if you have any ideas, or would like to collaborate on a project, or just want to give us some feedback. Contact us at learning@linnean.org.

Discover more at www.linnean.org/learning