

## Habitats lesson plan

Invertebrates are the most numerous organisms on our planet and as a result they live in every habitat imaginable from grassland and ponds to rotting wood and bogs- some even have homes made entirely of spit. Within these habitats they provide vital services for the environment. It is important to encourage these services by creating more habitats for invertebrates. In this lesson plan there are different activities for pupils to build artificial invertebrate habitats that will help encourage invertebrates into urban spaces.

### Learning Intentions:

The purpose of this lesson pack is to guide pupils through different groups of invertebrates and what functions they carry out within the habitats they live in that help the environment. By the end of the lessons pupils should be able to:

- Identify the habitats of invertebrates.
- Understand the requirements of an invertebrate to live in that habitat.
- Understand how living in this habitat would aid their daily survival and life cycle.
- Use this knowledge to design and build invertebrate habitats.

### Prior knowledge

Pupils should be familiar with a few common invertebrates e.g. bees or ants and what they look like, where they live and what they eat.

### Curriculum for excellence

- Pupils can listen and talk with others for different purposes, exchanging information, experiences, explanations, ideas and opinions, while clarifying points by asking questions (**LIT 1-09a**).
- Pupils listen and talk with others for different purposes; sharing information, experiences and opinions; explain processes and ideas; identify issues raised; summarise main points or findings and clarify points (**LIT 2-09a**).
- Pupils can identify and classify living things, and appreciate their diversity. They can relate physical and behavioural characteristics to their survival or extinction (**SCN 2-01a**).
- Pupils describe the likelihood of events occurring, using the knowledge and experience (**MNU 1-22a**).
- Through discovery and imagination, pupils develop and use problem-solving strategies to construct models (**TCH 2-14a**).
- Pupils will learn about different microhabitats and learn how the physical characteristics of the habitat affect what invertebrates live there (**SCN 1-01a / SOC 1-13b**).

### Core outcome

Pupils will understand that invertebrates live in a wide variety of habitats. Organisms provide vital functions within these habitats.

### Challenge outcomes

Some pupils will be able to think of larger habitat constructions for invertebrates and for larger animals such as mammals and birds.

### Pre-lesson

Discuss learning outcomes that you hope to achieve. Develop a health and safety contract with pupils over the correct way to behave in an outdoor environment that will ensure the wellbeing of invertebrates. This should be on a large poster, the pupils will then sign at the bottom to maintain the agreement.

Prior reading at [www.buglife.org.uk/](http://www.buglife.org.uk/), our website has many resources for helping with invertebrate identification.

### Additionally:

- Arrange transport to a site with green spaces; this could be to a grassland meadow or woodland.
- Complete a risk assessment.
- Assure proper dress for conditions e.g. wellies and waterproofs.
- Organise permission slips if heading off site from school.

## ACTIVITIES

### **Make a Wormery (takes 20 minutes)**

Worms are vital for aerating and mixing the soil and also decomposing organic waste. This activity will highlight these processes close up.



What you will need:

- Empty 2 litre bottle
- Scissors
- Moist soil
- Sand
- Old leaves
- Organic waste (fruit/veg peelings, tea leaves etc.)
- Large black paper
- Cellotape
- Dark cupboard
- Clingfilm

Get pupils to cut the top off the bottle at the curve into the cap. Fill the bottle alternatively with layers of moist soil (not wet!) and sand about 8cm and 2cm in length respectively. Leave a gap at the top and add leaves and other organic matter.

Now go out and find some worms! This could be made into a game, who can find the most worms? Worms are attracted to vibrations and stomping on the ground or placing a pitchfork into the earth while hitting it will bring earthworms to the surface.

Once you have enough worms (about 10), place them in the bottle. After placing the worms in the bottle, wrap clingfilm around the top to keep them in. Pierce some air holes into the clingfilm. Wrap black paper around the bottle so no light gets in then place the wormery into a dark cupboard. Periodically check the wormery and release the worms after two weeks.

When checking the wormery, ask the pupils:

- What has happened to the vegetable peelings?
- What patterns have the worms made in the earth?

### Outcomes

Pupils will realise that earthworms decompose and help to mix and aerate soil. Pupils will realise that this is a vital task for the planet; life on earth would not be possible without them.

### **Ladybird homes (takes 20 minutes)**

Ladybirds are important for protecting crops and gardens from plant eating insects such as aphids and scale insects. The UK's most common species of ladybird is the Seven spot ladybird and it is a voracious predator of aphids.



For this activity you will need:

- Empty plastic bottle (with cap)
- Scissors
- Cardboard/paper
- String
- Colouring pens

Cut the bottom off the bottles about 1cm up. Make sure the inside of the bottle is dry. Get the pupils to draw a picture welcoming ladybirds into their new homes and wrap this around the inside of the bottle so it faces outward then fold or roll up the cardboard and place inside making sure that none sticks out of the bottom. Pierce two holes on opposite sides at the bottom of the bottle and feed string through it, tying knots on either side so the string stays in place and holds the cardboard inside. Hang the bottle from the cap using string in an area of the garden or park on a tree or shrub.

Inspect the homes about once a week over the next few weeks and see if there are any ladybirds living in them. Check plants nearby for aphids and evidence of ladybird activity. Ask pupils:

- Why do ladybirds live in these homes?
- What do these homes remind you of?
- Are more ladybirds a good thing?

#### Outcomes

Pupils realise that the homes are warm and dry like greenhouses. They will realise that ladybirds provide a vital service for controlling aphids. Pupils will realise that encouraging more is beneficial for the garden.

## Solitary bee homes (takes 30 minutes)

Not all bees live in hives, 80% live a solitary lifestyle in burrows in wood, hollow stems or bare ground and rarely interact with other bees. There are over 250 species of solitary bee in the UK and they are very efficient pollinators. It is important that we promote these pollinators by creating habitats such as wildflower meadows for their survival.



For this activity you will need:

- Waterproof container – such as a plastic bottle or juice carton - or length of plastic piping
- Scissors/saw
- Warm fabric – such as an old jumper, cardboard or wool
- Enough hollow tubes to fill the container - such as straws, bamboo canes (aim for each to be 15cm long, or at least slightly shorter than the length of the waterproof container so they stay dry)
- Air-drying clay or stiff mud that's not too wet
- String or wire

Cut the top off the bottle (20cm from the cap). Cover the bottom of the bottle with clay/mud. Cut the tubes to fit the bottle, pack them as closely as possible. Bind them together using wool. Place the bundle into the container and line it with the rest of the warm fabric so that the tubes cannot move. Use string or wire to hang up the bottle. The tubes must:

- Face south/south east to get the early sun when the bees are most active.
- Be firmly held in place.
- Be taken in if the outside temperature drops below -5 °C.

- Be replaced after two years.
- Be slightly shorter than the length of the bottle so they stay dry.

When the holes are covered with leaves, mud, hair etc. bees may be occupying the tube. Different species of bee have different ways of covering their tube and there may be up to 10 larvae living in a tube.

Ask the pupils:

- Why do these bees live in these tubes? [dry, warm and above ground]
- What services do these bees provide us? [excellent pollinators]
- Why should we look after the bees like this? [pollinate foods we like: tomatoes and strawberries exclusively – without them these foods would not exist]
- Why are the bees smothered in pollen? Why does this make them good pollinators? [taking this pollen back to their tube for their young to eat, coincidentally they spread much more pollen than bumblebees]

### Outcomes

Pupils will learn that the majority of bees are solitary in nature. They will also see how these solitary bees live. They will see different species and how efficiently they pollinate.

### **Bug hotels (takes 45 minutes)**

Deadwood and leaf litter is home to many species. These species break down organic matter and recycle it. Increasingly deadwood and leaf litter is being lifted and removed from green spaces. This practice is increasingly damaging species that live in these habitats.



This activity involves going to a green space that has discarded objects such as deadwood, leaves, pine cones and grass. The pupils take these materials and build their own “bug hotels”. These can be as big and elaborate as they want. They must fulfil three requirements for their invertebrate inhabitants, they must provide:

- A place where they can bask (sunbathe)
- A place to hide (luxury rooms)

- Something for them to eat (a glamorous restaurant)

Encourage the use of imagination with other stuff that could be included: a slide, bungee jump, gymnasium etc. The hotel must have a name (i.e. bug-ingham palace). After building the hotel the pupils have to describe it to their classmates. This activity is best done in groups to encourage teamwork and discussion. The pupils could check up on their bug hotels in a week to see if they have any guests.

Questions to ask:

- Why do invertebrates like deadwood? [damp, dark, food]
- Why do they need to bask? [charge themselves]
- Are there more invertebrates after a week? [bigger invertebrates will also appear]

### Outcomes

Pupils will realise their impact on the environment through creating habitats for invertebrates. Pupils will see the need for dead wood and leaf litter in green spaces. Pupils will learn about invertebrates found in green spaces.