Year 2 Science lessons pack

Why are bees so brilliant?

The Harmony Project

Year 2

Science lessons pack

ENQUIRY QUESTION

Why are bees so brilliant?

LINKED HARMONY PRINCIPLE

The principle of Interdependence

‘We can learn from bees that we all have a role to play in helping Nature to thrive.’

The six lesson plans in this pack can be used to deliver the science content for the Year 2 enquiry of learning *Why are bees so brilliant?*, linked to the principle of Interdependence. This science learning builds on the foundations of the National Curriculum statutory requirements relating to living things and their habitats.

Each lesson plan includes opportunities to refer to the children’s prior learning, as well as questions to use to reflect on current learning and to assess the children’s developing knowledge and understanding. In addition, lessons feature key elements that are distinctive to the Harmony approach to teaching and learning, for example: opportunities to **learn about Nature,** to **learn in Nature** and to **learn from Nature.**

A summary of each of these elements in relation to the six lesson plans in this pack is set out on the next pages.

The Harmony Project

01 - Learning about Nature

The statutory requirements of the National Curriculum set out what children need to learn about Nature – although, of course, their wider learning about Nature will extend beyond this.

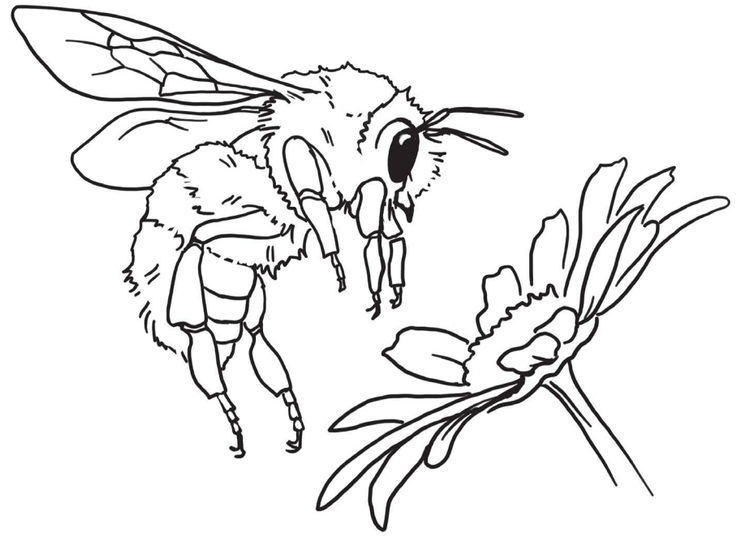
As children progress through their primary education, we can map the journey that their learning about living things and their habitats will take. By understanding their prior learning about living things and their habitats in the EYFS and Year 1, and by looking ahead to the path this learning will take in Years 3-6, we are better able to plan for progression.

The table below shows where the science learning about living things and their habitats, covered in the lesson plans in this pack, sits within this journey.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ENQUIRY	**Understanding the world**	**What will we find at the seaside?**	**Why are bees so brilliant?**	**How can we identify native trees in autumn?**	**Why should we protect the biodiversity of the rainforest?**	**How can we restore our UK habitats back to health?**	**Where do migratory animals travel to and from and why?**
SUMMARY OF LEARNING	Children will be guided to increase their knowledge and sense of the ecologically diverse world around them. They will begin to recognise and name different habitats and the animals that live within them. They will discover how habitats provide for the needs of different animals and plants and that different animals and plants are suited to different habitats	Children learn about living species that live in ecosystems within a beach habitat. They will consider particular characteristics that help animals to survive within this particular habitat and the changes that occur across the four seasons	Children explore the life of bees. They will learn how bees are suited to particular habitats and describe how these habitats provide for their basic needs They will learn how plants and bees depend on each other to survive and thrive	Children develop their knowledge of the needs of plants to include healthy soil and nutrients. They recap the structure of a plant and learn the function of each part of the plant. Children investigate how water travels within the plant	Children explore living things within different food chains, identifying producers, predators and prey. They learn how to use classification keys to help group, identify and name a variety of plants and animals within local and wider environments. They learn about the potential dangers to living things that can be caused by changes in environments	Children learn to describe the differences in life cycles of different living species within a variety of UK habitats. They will build on their knowledge of how plants reproduce including seed dispersal and pollination, and learn about photosynthesis	Children explore how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Children explore how living things are classified into broad groups and give reasons for classifying animals based on specific characteristics
KEY VOCABULARY	home, habitat, food, water, shelter, woodland, pond, sea, ocean, rainforest, land, desert, polar, river	seaside, tide, sea snail, mussel, topshell, limpet, (hermit) crab, spiny starfish,rockpool, anemone, blenny, seaweed, algae, whelk, shrimp, sunrise, sunset	microhabitat, bee species, bee-friendly habitats, solitary, social, colony, hive, honeycomb, queen, worker, drone, threats	flowering plant, nutrients, bark, twig, trunk, seed dispersal	tropical, temperate, rainforest, food chain, producer, predator, prey, environment, habitat, microhabitat, classification key	moorland, heathland, wetland, reproduction, carpel, stamen, anther, filament, stigma, style, ovary, ovule, indicator species, endangered, photosynthesis	resident, migrate, (non) migratory, classification, taxonomy, observable characteristics, Linnaean, kingdom, phylum, class, order, family, genus, species

The table below sets out what the children's learning about living things and their habitats looks like over the course of the six lessons.

Week 1	Week 2	Week 3
What habitats do bees live in?	**How do wild honeybees depend on their habitat and each other?**	**How do bees get food from flowers?**
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 microhabitats	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 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. 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
Week 4	**Week 5**	**Week 6**
Why do we need bees?	**What things threaten bees?**	**What can we do to help bees?**
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. 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 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 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



02 - Learning in Nature

In addition to learning about Nature, a Harmony approach also provides suggestions for rich opportunities to learn in or alongside Nature, as the six science lessons in this pack demonstrate.

For example, the children will survey and evaluate the availability of local bee-friendly habitats, take time to closely observe different types of flowers and to monitor bee activity in a local bee-friendly space.

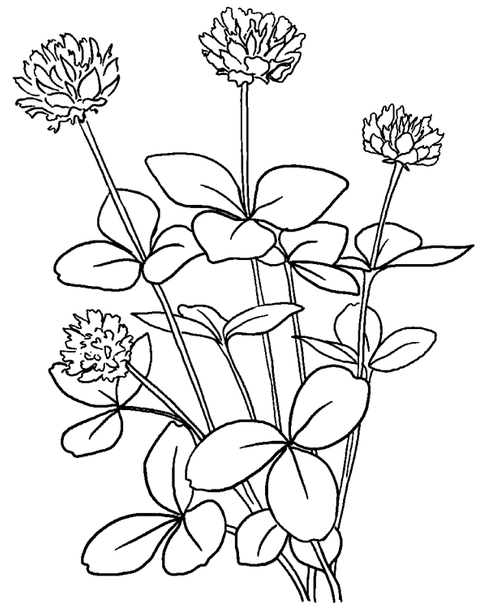
As they learn in Nature, the children will also experience opportunities to develop their skills in working scientifically. Although these skills will be developed incrementally over time (as shown in Appendix A), the coverage of these skills within the sequence of these six lessons is set out below.

Week 1	Week 2	Week 3
What habitats do bees live in?	**How do wild honeybees depend on their habitat and each other?**	**How do bees get food from flowers?**
Identifying and classifying	Asking simple questions and recognising that they can be answered in different ways	Gathering and recording data to help in answering questions
Scientific enquiry type: Identifying, classifying and grouping	Scientific enquiry type: Research using secondary sources	Scientific enquiry type: Pattern seeking

Week 4	Week 5	Week 6
Why do we need bees?	**What things threaten bees?**	**What can we do to help bees?**
Observing closely, using simple equipment; gathering and recording data to help in answering questions	Asking simple questions and recognising that they can be answered in different ways	Using their observations and ideas to suggest answers to questions
Scientific enquiry type: Pattern seeking	Scientific enquiry type: Research using secondary sources	Scientific enquiry type: Research using secondary sources

Working scientifically vocabulary

- identify
- similar
- different
- group
- observe
- research



03 - Learning from Nature

The third key element of a Harmony approach to learning is learning from Nature, which is linked to progression in understanding of Harmony principles. This aspect of learning supports the development of children's understanding of what it means to live sustainably.

The six lessons in this pack, and the wider enquiry they are part of, are underpinned by the principle of Interdependence; they build on children's prior learning in the EYFS and Year 1 and prepare them for their learning in Years 3-6.

The children's progression in their understanding of the principle of Interdependence, through enquiries of learning that help us to think and live more sustainably, is shown below.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ENQUIRY	Children are introduced to opportunities to explore and develop their initial knowledge and understanding about interdependence (observing bees, butterflies or wasps pollinating plants, when we work as a team)	**What will we find at the seaside?**	**Why are bees so brilliant?**	**What is the story of our food?**	**How did the Anglo-Saxons farm and how was it different from today?**	**How can we ensure our seas and oceans stay amazing?**	**How are we connected to Antarctica?**
PROGRESSION: CONCEPT OF INTERDEPENDENCE		How do the living things we find at the seaside depend on each other?	Why do we need bees and other pollinators?	Where does our food come from?	How did the Anglo-Saxons build community and work together?	What makes our seas and oceans amazing?	What is the link between temperature change in Antarctica and our school's electricity use?
THINKING SUSTAINABLY		What can we do to look after the seaside?	What can we do to help bees?	How can we eat more seasonal food?	How can we support our UK farmers through the food choices we make?	Why is plastic pollution a problem and what can we do about it?	How can we monitor data, analyse it and reduce the energy we use in school?
THINKING SUSTAINABLY VOCABULARY	team together look after care	ecosystem role value relationship individual whole litter	connection community part species colony	action reaction consequence impact seasonal	group holistic collective cooperation reciprocate organic	support depend wellbeing ecology biodegradable	isolation essential partnership survival considered view climate change consequence

Lesson **01**

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

What habitats do bees live in?

NC Links

Living things and their habitats
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 microhabitats

Working scientifically:
Identifying and classifying

Scientific enquiry type:
Identifying, classifying and grouping

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Copies of Resource 1C (one per group of pair)

Nature journals

Optional: A copy of *The Bee Book* by Charlotte Milner

Adapt the learning

Highlight key vocabulary on the fact cards so children requiring additional support can include these terms on their posters or in their Nature journals.

Challenge the children to extend the information included on their poster or in their Nature journal, explaining what different habitats and microhabitats provide for different bees.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature

What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by displaying the word 'habitat'. Display the images on Resource 1A of four different habitats the children have already learned about (a coral reef, a wildflower meadow, a polar habitat and a rockpool).

In pairs, the children take it in turns to 'Speak like an expert' about what they know about these habitats or habitats in general. They speak for 15 seconds at a time so that each child adds to the information their partner has already shared.

With reference to the four images on Resource 1A, ask the children: *What lives in a habitat like this?* You could display the animals on Resource 1B to support this discussion, focusing the children's attention on one animal at a time. Address any misconceptions.

What are we learning today?

Move the children's **learning about Nature** on by displaying the word 'microhabitat' and inviting them to share anything they already know, or can infer, about its meaning. Explain that a microhabitat is a much smaller area within a habitat, for example, a clump of moss on a tree or the space underneath a log in a woodland. Although microhabitats are small, they offer the creatures that live in them things they need to survive (e.g. food, shelter).

Explain that bees, like other small animals, can be found in microhabitats within much larger habitats.

Introduce the fact cards on Resource 1C about different bee species and the microhabitats and habitats they can be found in.

Working in pairs or small groups, the children read the information and explore different ways they could group or organise the cards according to similarities or differences they notice. For example, the common carder bee and the white-tailed bumblebee both nest in old mammal burrows (microhabitat); ashy mining bees create a microhabitat to nest in by digging underground, but honey bees nest in gaps in trees. Discuss their ideas as a class.

Show the children how to spot a mining bee nest (microhabitat) by sharing the image on Resource 1D and discussing what the children can see.

TEACHER TIP:
Either in this lesson, or at another point in the school day, you could share with the children *The Bee Book* by Charlotte Milner, which works well to support this learning. You can find more information about the UK's bee species on The Woodland Trust webpage 'Types of bee in the UK: How to tell the difference' or in the 'Bees and Wasps' section of The Wildlife Trusts' website.

How are we learning today?

Take the children outside to **learn in Nature**, either in the school grounds or in a local green space. Using the information on the fact cards on Resource 1C, the children search for examples of bee-friendly habitats or microhabitats that would suit different species of bee.

In pairs, the children take on the role of bee estate agents and present the benefits of the habitats or microhabitats they have found or learned about to prospective new bee tenants. Challenge the class to identify which species of bee would be best suited to the habitat or microhabitat and why. If the children haven't found any or many bee-friendly habitats or microhabitats outdoors, they could discuss what would make the outdoor space more bee-friendly and why.

STEM SENTENCE:
_____ is an example of a habitat.
_____ is an example of a microhabitat.
This would be the ideal habitat for a _____ bee because _____.

Back in the classroom, the children choose one or more of the bee-friendly habitats or microhabitats they have found or learned about and create a poster or an entry in their Nature journals, drawing the habitat or microhabitat and the bee species suited to it. They use labels or short sentences to explain their thinking. Alternatively, they could create a poster showing how they would introduce microhabitats to make the school grounds or local green space more bee-friendly.

What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by asking: *What habitats or microhabitats do different bees live in? How do they meet the bees' needs?*

Challenge their thinking by asking: *Do humans have habitats? Are our homes microhabitats? Why or why not? How do our homes meet our needs? How does this compare to bees?*

Draw out the link between this learning and the **principle of Interdependence** by discussing with the children how bees are dependent for their survival on the habitats and microhabitats they are suited to.

In areas where there aren't many bee-friendly habitats and microhabitats, humans have found ways to provide things like shelter that bees depend on, for example, using bee bricks to add nesting sites for certain bees to the walls of buildings.

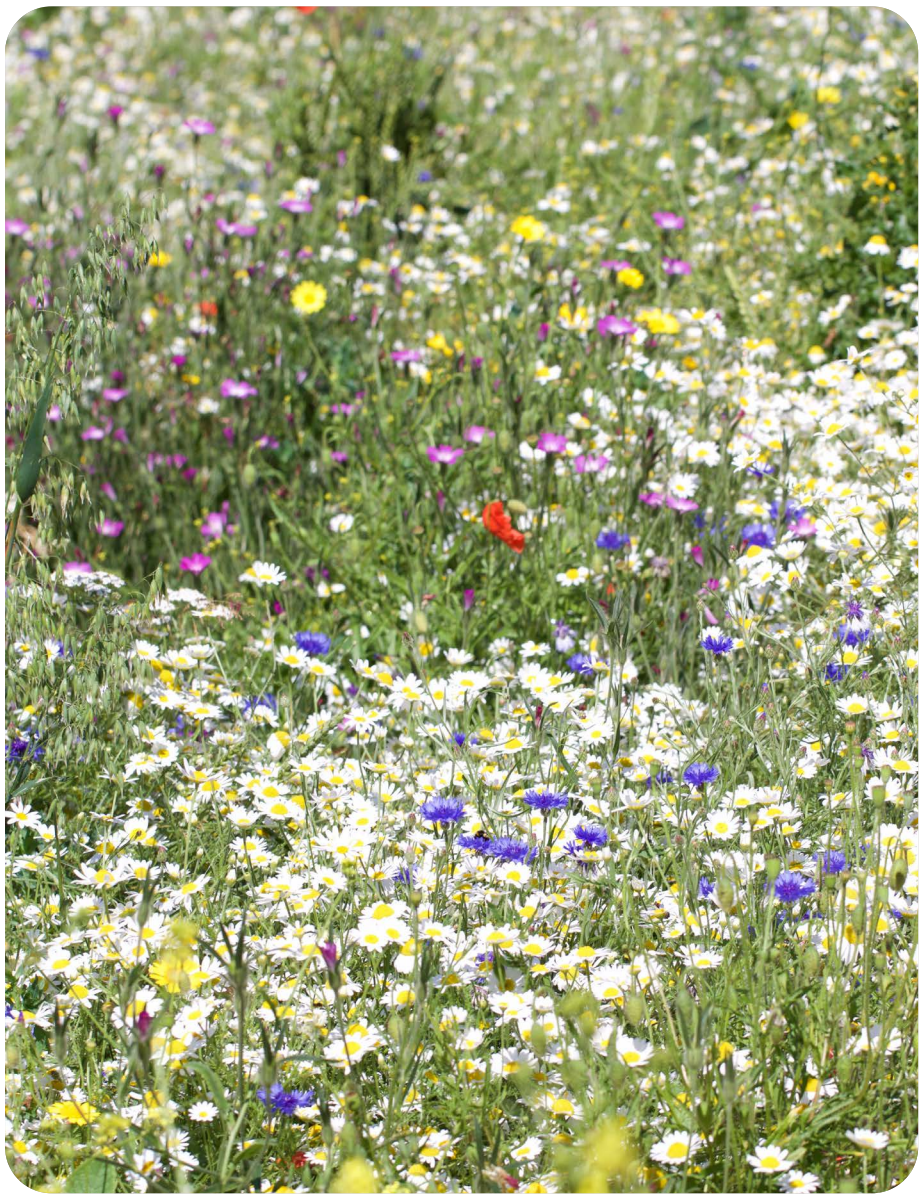
TEACHER TIP:
There are around 270 species of bee in the UK, of which 24 are bumblebees. The vast majority of UK bee species are solitary. This means they don't form colonies.

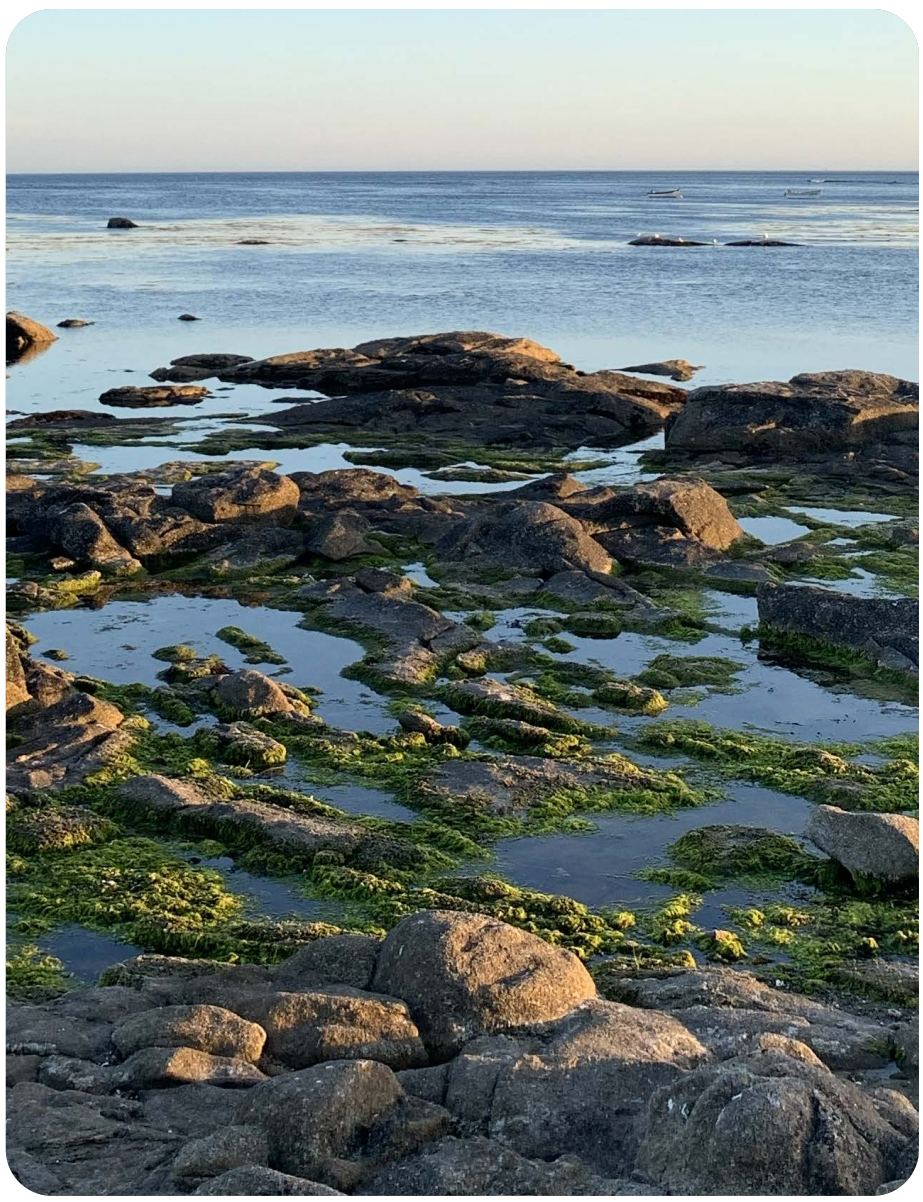
Lesson 01

Enquiry question:
Why are bees so brilliant?

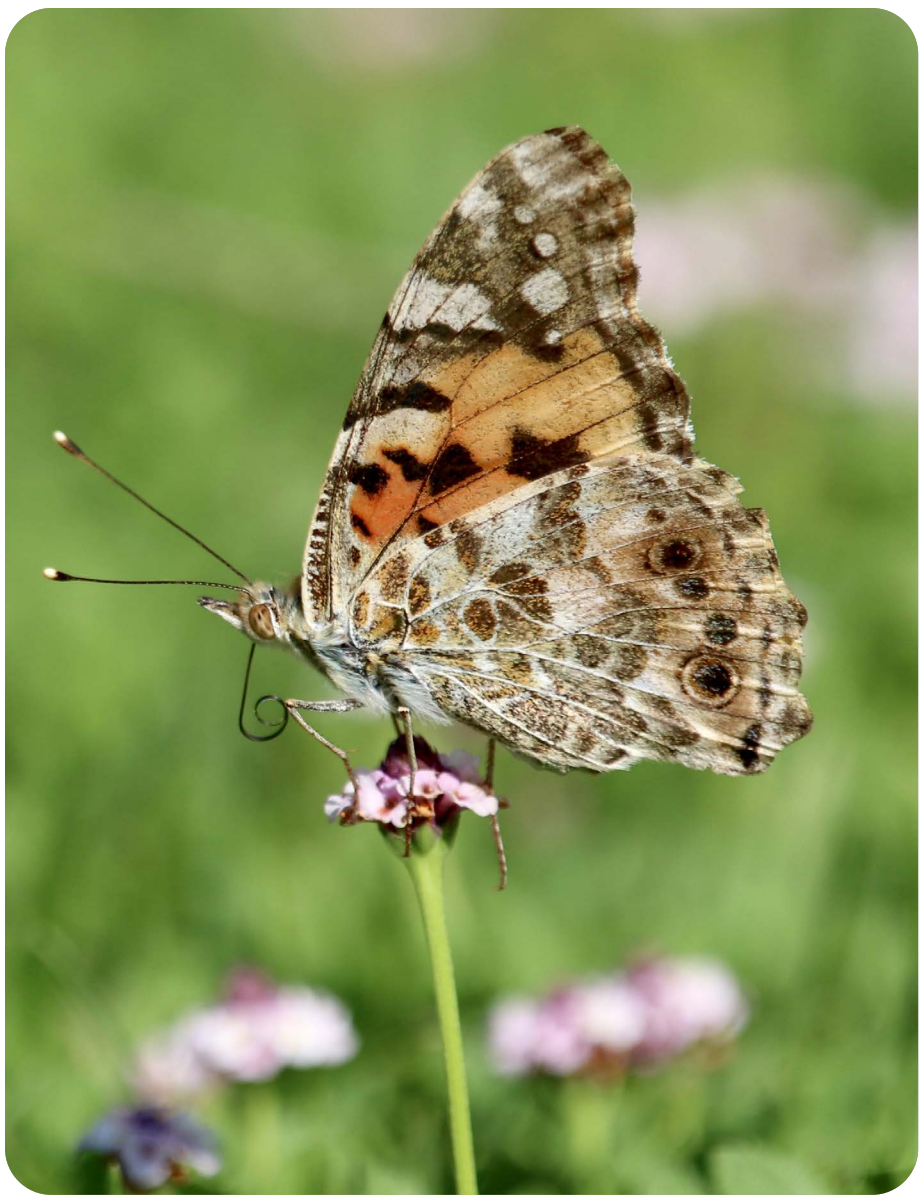
Harmony principle:
The principle of Interdependence

Resource 1A





Resource 1B



Resource 1C

tree bumblebee

Tree bumblebees live in gardens and some woods. This is their habitat.

They nest in old birdboxes and in the roofs of houses. These microhabitats are made by people.

ashy mining bee

You might see ashy mining bees in habitats such as grassy places, in gardens and in towns.

They nest underground by digging into the soil. The nest is a microhabitat made by the bee.

white-tailed bumblebee

White-tailed bumblebees live habitats with lots of flowers. You can see them in gardens, on farms and on the edges of woods.

They nest underground in microhabitats like old mammal burrows or under garden sheds. They even in nest in gaps in walls.

hairy-footed flower bee

You can spot hairy-footed flower bees in habitats like parks and gardens.

They nest between the bricks in walls and sometimes underground by digging their own microhabitat.

Resource 1C

honey bee

Honey bees live in lots of different habitats like gardens, farms and woods.

They nest in microhabitats like hives or in holes and gaps in tree trunks in the wild.

tawny mining bee

You can spot tawny mining bees in habitats like gardens and parks.

They nest underground by digging into the soil. The nest is a microhabitat made by the bee.

red mason bee

You can spot red mason bees in habitats like gardens and parks.

They nest in microhabitats made by people like gaps in old walls, window frames and even key holes! They also nest in hollow plant stems and the holes beetles make in dead wood.

common carder bee

Common carder bees live in lots of different habitats like gardens, parks, woods and farms. They like habitats with lots of flowers.

They nest in microhabitats like old mammal burrows, birds nests and even in clumps of moss growing in lawns.

Resource 1D

Which bee lives in a nest like this?

Lesson

02

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

How do wild honeybees depend on their habitat and each other?

NC Links

Living things and their habitats
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

Working scientifically:
Asking simple questions and recognising that they can be answered in different ways

Scientific enquiry type:
Research using secondary sources

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Fact cards on Resource 2C, printed on card and distributed throughout the outdoor learning space

Nature journals

Optional: A copy of *The Bee Book* by Charlotte Milner

Adapt the learning

Children requiring additional support with reading may benefit from a scaffolded opportunity to role play each role, prior to the main activity.

Challenge the children to consider what would happen if one of these roles was missing in the wild honeybee colony.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature

What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** with reference to bee species and bee habitats. Display the images on Resource 2A and ask the children to 'Link two', explaining their reasoning. For example, they might link two bee species that live in similar microhabitats or they might link a bee species with its habitat.

As the children: *What do bees need from a habitat or microhabitat?* (e.g. shelter, food, water). Share ideas and address any misconceptions.

What are we learning today?

Begin the children's new **learning about Nature** by establishing that in this lesson they will be learning about wild honeybees in more detail, and about how they depend on their habitat and on each other.

Using the spotlight tool on the interactive whiteboard, explore a small area of the image of a wild honeybee nest on Resource 2B. Explain that the image shows the bees in a microhabitat and see if the children can identify it.

Reveal the image and establish that the wild honeybee colony has moved into a hole in the trunk of a tree. This hole is an example of a microhabitat.

Ask: *What do you think this microhabitat provides for the bees? What larger habitat might this microhabitat be part of? What might the larger habitat provide for the wild honeybees?* Encourage the children to draw on their learning from the previous lesson to suggest that the hole in the tree trunk provides shelter for the bees, that it could be part of a woodland and that wildflowers growing around the edges of the woodland might provide a source of food for the bees.

Establish that the bees that make the honey we buy in shops are kept in hives so it's easy to collect the honey they make. A beehive isn't the bee's natural microhabitat but a hole in a tree trunk is.

Explain to the children that some bees are solitary (they live alone) and some are social (they live in groups called colonies) and discuss the meaning of these terms. Ask the children: *Are wild honeybees solitary or social bees? How do you know?* Encourage them to refer to the evidence they can see in the image on Resource 2B to give reasons for their thinking.

Explain that social bees like wild honeybees that live in a colony don't just depend on their habitat and microhabitat to survive, they also depend on each other.

How are we learning today?

The next part of the lesson could take place outdoors, giving the children the opportunity to **learn in Nature**.

Explain that wild honeybees in a colony all have special jobs to do that help the whole colony. There is only one queen but there are lots of drones and even more worker bees. The queen and workers are all female. Every worker bee carries out different worker roles in their lifetime; this changes with age. The drones are all male. The children's task will be to find out as much as they can about these bees and the jobs they do, using the 10 fact cards located around the learning space. To support their understanding of the information on the cards, introduce the word larvae to describe the young bees that have recently hatched.

In groups of three, the children explore the outdoor learning space to locate the 10 fact cards on Resource 2C.

They read the information on them about the roles of different wild honeybees within a colony and record the key information in their Nature journals. They could, for example, draw a wild honeybee in the centre of a page and record information about the different roles around it.

Encourage the children to draw a 'curiosity box' on a page in their Nature journals to note any further questions arising from the learning. They can either cross these through as answers become apparent during the lesson or suggest ways that they could find out the answers at another time.

TIME TO EXPLAIN:
Drawing on what they have learned in the previous activity, create a class model of a wild honeybee colony with different children taking on the role of different bees with different jobs.

Explain that in a real colony, there would be as many as 60,000 bees but they will be creating a smaller model to represent the colony. The children will already know that there is only one queen but challenge them

to predict how many drones and different worker bees there would be in the colony.

Discuss their ideas then reveal the number of each bee needed for the class model (assuming 30 children) and allocate roles:
queen 1
drones 5
worker (cleaners) 2
worker (nurses) 2
worker (builders) 2
worker (guards) 2
worker (honey makers) 2
worker (food collectors) 10
worker (scout) 2
worker (queen's helpers) 2

Set up the class model with the children acting out the role of the type of bee they have been allocated. At this stage in the lesson, you could introduce the word forager to describe a bee tasked with collecting food.

Freeze the model from time to time and highlight one type of bee. Ask the class to describe the bee's job before moving on to another type of bee. You might also ask: *How do the other bees depend on this bee?*

STEM SENTENCES:
I am a _____
This bee's job is _____
This job is important because _____

TEACHER TIP:
In autumn, the drones are ejected from the nest and die. With fewer mouths to feed over the winter, the store of honey the colony has built up goes further. The wax used to make the honeycomb in which the honey is stored is actually secreted from the bees' abdomens. It hardens into tiny flakes on their bodies, which the builders collect.

What have we learned today?

Show the tree trunk, honeybee, honeycomb and flower images on Resource 2D and invite the children to draw on their learning to explain how these things are connected. For example, they might suggest that the tree and the bee are connected because the tree provides the bee with a microhabitat; the bees collect nectar and pollen from the flowers to feed the colony and pollinate the flowers in return; worker bees build the honeycomb and fill it with honey to make sure the whole colony is fed.

Reflect on the children's **learning about Nature** and assess their understanding by asking: *What do wild honeybees need from their habitat or microhabitat? What do wild honeybees in a colony need from each other?*

Draw out the **learning from Nature** by discussing how the roles of the different bees and the tasks they perform are essential if the colony is to survive and thrive. This is a great example of how things work well when all the parts within a system work well together.

Ask the children: *What are the needs of everyone in your home? Who makes sure everyone is fed? What jobs do you do in your home to help? What are some of the different jobs people do at school?* Draw the children's attention to the way in which people in a group or community are interdependent.

TEACHER TIP:
Heater bees are workers that move around rapidly to raise their body temperature before diving into a cell in the honeycomb. Their body heat helps to keep the larvae at a constant temperature of 35 degrees.

Resource 2A

white-tailed bumblebee

wildflowers

tawny mining bee

mining bee nest

tree bumblebee

tree bumblebee nest

Resource 2B

What is this microhabitat?

Resource 2C

queen

There is only one queen in a wild honeybee colony.

Her job is to lay eggs.
Larvae hatch from the eggs.

The queen has a special smell that keeps all the other bees happy and makes them want to work together.

worker (cleaner)

When a swarm of bees takes over a nest, the cleaner bees get to work.

They clean out the nest so other worker bees can start building new honeycomb. They get rid of cobwebs, dust, dead insects and any rotten wood.

Resource 2C

drone

Drones are the only male honey bees in the colony.

Their job is to help young queens from other colonies lay eggs that will turn into offspring. They spend a lot of time away from the nest.

worker (nurse)

When the larvae hatch from the eggs, they look like tiny white worms. The nurse bees feed them a blob of special food called royal jelly. The nurse bees make the royal jelly in their heads. It's full of things the larvae need to grow strong and healthy. After this, the larvae eat pollen and honey.

Resource 2C

worker (food collector)

About a third of all worker bees are food collectors. They leave the hive every day to find nectar and pollen from flowers.

Food collectors suck up nectar with their long tongues and collect pollen on the hairs covering their bodies.

worker (builder)

Builder bees make the honeycomb inside the nest. They take tiny bits of wax made by other bees and shape them into hexagon-shaped tubes. These tubes fit together perfectly.

Other bees store honey and pollen in the honeycomb and the queen lays her eggs here, too.

Resource 2C

worker (guard)

Guard bees protect the entrance to the nest. They stop bees from other colonies stealing their honey. They also fight off wasps and hornets that try to attack.

If a guard stings an animal to protect the hive, the bee dies straight away.

worker (scout)

Scout bees are special food collectors that know the local area very well.
When they find the best places to collect nectar and pollen, they come back to the hive and do a special dance to tell the other bees where to go.

Resource 2C

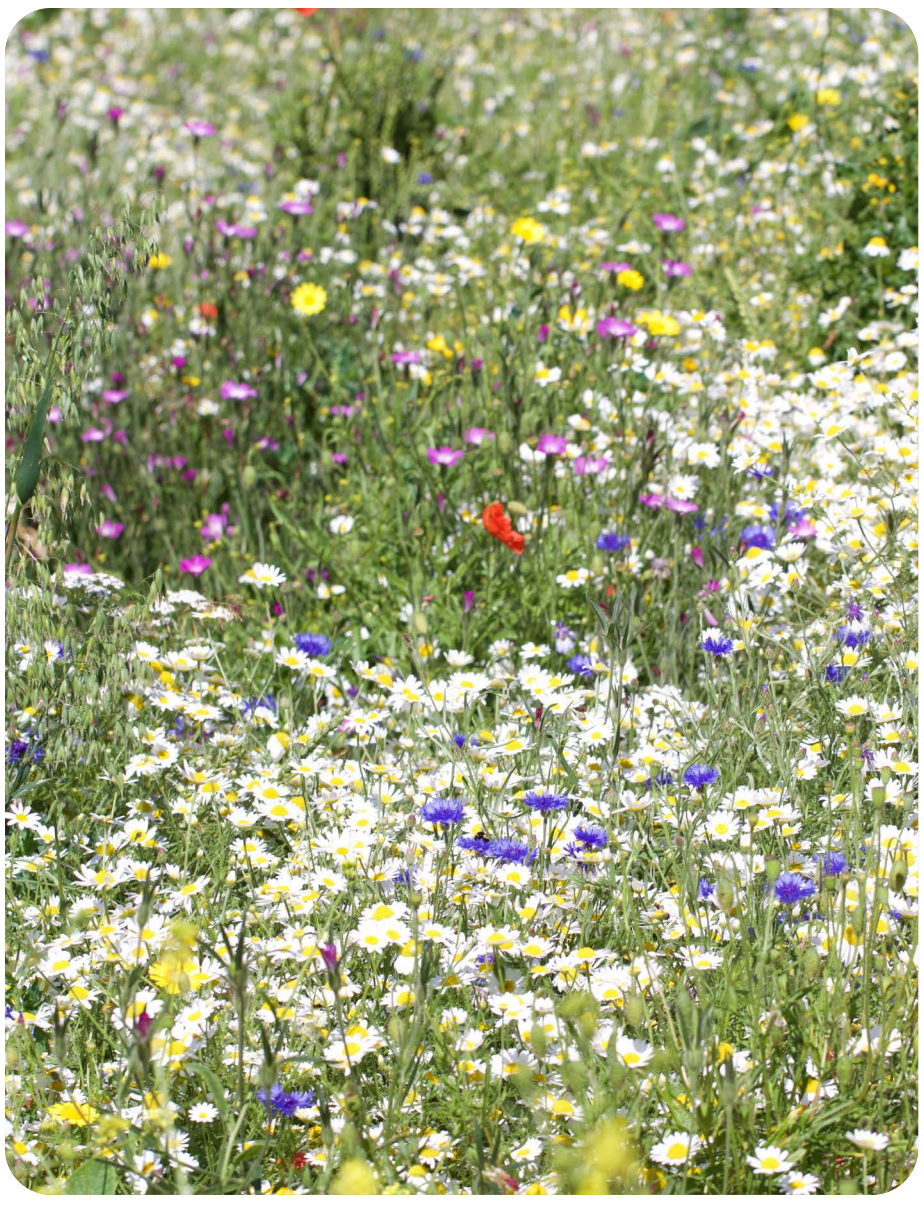
worker (honey maker)

When food collectors bring nectar back to the hive, the honey makers turn it into honey. They pass the nectar from mouth to mouth many times to remove the water from it. When the honey is ready, they put it in the honeycomb and add a wax lid to keep the honey fresh.

worker (queen's helpers)

Some worker bees have the important job of looking after the queen.
They feed her honey and keep her clean.
The queen stays inside the dark nest nearly all her life, so she needs helpers to take care of her while she lays eggs.

Resource 2D



Lesson

03

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

How do bees get food from flowers?

NC Links

Living things and their habitats
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

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

Working scientifically:
Gathering and recording data to help in answering questions

Scientific enquiry type:
Pattern seeking

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Copies of Resource 3C (one per pair)

Clipboards

Magnifying glasses

Adapt the learning

Support less confident readers by ensuring that they are guided to use visual shortcuts alongside each question on Resource 3D.

Challenge the children to include in their speeches additional detail about the benefits of their proposals for bees.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature

What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** from the Year 1 learning enquiry *Which is my favourite wildflower and why?*

Show the six images of different flowers on Resource 3A. Ask the children: *What's the same? What's different?*

Draw out in discussion the variety of different shapes and colours.

Extend the children's thinking by asking: *Why do plants need flowers?* (e.g. to make seeds and reproduce) *Why do bees need flowers?* (e.g. to collect nectar and pollen as a food source). Share ideas and address any misconceptions.

What are we learning today?

Move the children's **learning about Nature** on by reminding them of the three fact cards from Resource 2C relating to the following bee roles: worker (builder), worker (honey maker) and worker (food collector/forager). In pairs, the children discuss what they can remember from the previous lesson about these three roles before sharing their ideas with the class. Use the information on the fact cards to guide a class discussion.

Draw out the fact that the worker bees responsible for building honeycomb and making honey in the wild honeybee colony depend on the workers collecting food (nectar) and bringing it back to the nest to make the honey (they also gather nutrient-rich pollen).

Ask the children: *How do the bees collecting nectar from flowers know where to find it?* The BBC Earth Waggle Dance film clip explores the waggle dance that scout bees perform to let other bees in the colony know the location of the food source they have found. Watch the section from 0:40 to 1:20 with the sound off and ask the children: *What is this bee doing?*

Discuss their ideas before explaining that when the scouts find a good source of nectar and pollen in the bees' habitat, they return to the nest to tell the other food-collecting worker bees where to find it. They give the other bees directions by doing a 'waggle dance'. The movements of the bee performing the waggle dance tell the other bees the direction and distance of the source of food the bee has found. Encourage the children to have a go at performing the waggle dance themselves.

Establish that while honeybees perform the waggle dance to tell other bees in the colony where to find food, solitary bees have to find food on their own. Fortunately, some flowers have special colours, patterns, scents and shapes that make it easier for different species of bees to find them and to get the nectar and pollen from them that they need.

Show the children the three images on Resource 3B and ask: *What patterns or markings can you see on these flowers? How might they help guide bees to the nectar and pollen?* The children discuss these questions in pairs before sharing their ideas with the class. Explain that foxglove flowers have spots and wild geranium flowers have lines on their petals to guide bees to the nectar and pollen in the centre of the flowers. Other flowers have markings that do the same job but are only visible to bees.

Draw the children's attention to the yellow centres of some of the forget-me-not flowers. Ask: *Why do you think these are a different colour to the centres of some of the other forget-me-nots?* Once the children have discussed this in pairs, reveal that the yellow centres highlight to bees where the nectar and pollen can be found. When the flower has been pollinated and stops producing nectar and pollen, the yellow centre turns white (also visible in the image).

Display the image of a wildflower meadow on Resource 3C and ask the children: *How many different coloured flowers can you see? Do you think this would be a good habitat for bees?*

Establish that a habitat that has plants growing in it with different colours, patterns, scents and shapes will attract a wide range of different species of bees. These are bee-friendly habitats.

TEACHER TIP:
Different bees' tongues are different lengths to allow them to access the nectar in different-shaped flowers. The garden bumblebee has a tongue that is roughly the same length as its body – the longest tongue of any bee (up to 20mm)! This allows it to gather nectar from tubular flowers such as hedge nettle. Other long-tongued bees include the common carder bee and hairy-footed flower bee. Some bees with short tongues (including honey bees) have learned to make a hole in the base of the flower to get to the nectar that way!

How are we learning today?

The next part of the lesson takes place outdoors, giving the children the opportunity to **learn in Nature** – either in the school grounds or in a local green space.

Explain to the children that they will be finding out whether the outdoor space they are learning in is a bee-friendly habitat by collecting information about the flowers that grow there. Their research will be guided by the following questions:
Are there different-coloured flowers?
Are there flowers with a strong smell?
Are there flowers with a pattern?
Are there flowers with different shapes?

Introduce the four activities on Resource 3D and allow the children some time to read through them in pairs or read through them as a class. Discuss as a class and ensure that all the children understand the instructions and how to record their results. In pairs or small groups, they survey the availability of flowers with different properties to determine how bee-friendly the habitat is. Encourage them to look out for bees as they learn – they could note down any observations about how bees interact with flowers in their Nature journals.

Invite the children to feed back to the class what they have found and discuss how bee-friendly the habitat is, drawing on the data they have collected. Encourage them to compare the data they have found with what other children have found and to identify any patterns. Ask the children: *What would make this habitat more bee-friendly? What type of flowers could we add so there is more food for different bees?*

TIME TO EXPLAIN:
Working in pairs, the children prepare and present short speeches to the school community, the headteacher or the governors, outlining what they think needs to be done to increase the amount of food available to bees in the school grounds. They should draw on their science learning from this lesson and apply it to their school context.

STEM SENTENCES:
Flowers attract bees with _____.
Different bees can get nectar from different flowers because _____.
To make this a bee-friendly habitat, we should _____ because _____.

TEACHER TIP:
You could watch the BBC Bitesize film clip 'Why are bees attracted to flowers?' to consolidate this learning.

What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding, by asking: *How do honeybees know where to find flowers to gather food? How do flowers help to attract bees? Why is it important for bees to have lots of different flowers in a habitat?*

Draw out the link between this learning and the **principle of Interdependence** by discussing with the children how bees are dependent on food sources within their habitats and microhabitats to survive. In areas where there aren't many bee-friendly food sources, humans have found ways to provide food for bee, for example, by sowing wildflowers as the children did in Year 1 or by planting bee-friendly flowers in parks, gardens and windowboxes.

You could also reference the waggle dance in the class discussion as an example of how bees work together to find food in their habitat.

Resource 3A

bird's-foot trefoil

buttercup

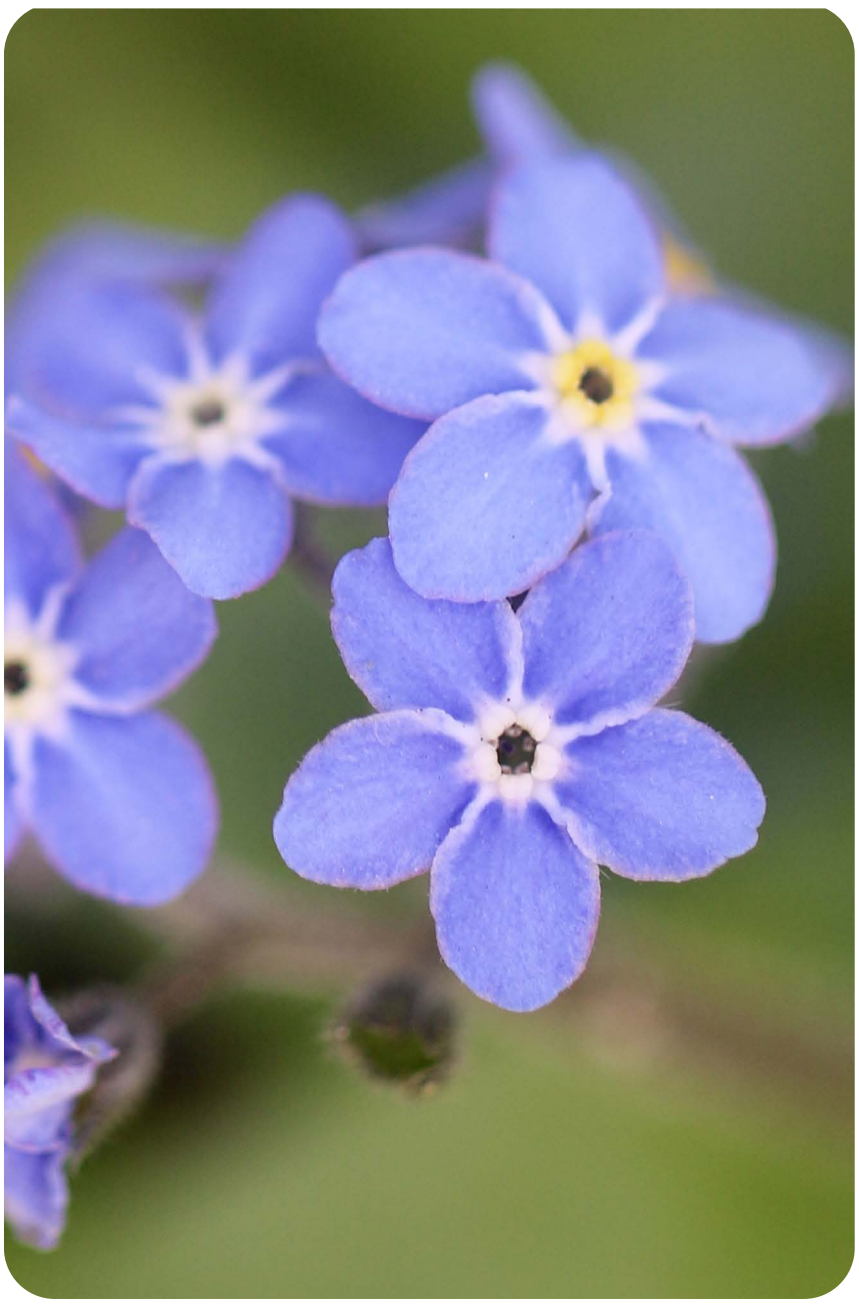
foxglove

hedge nettle

daisy

yarrow

Resource 3B

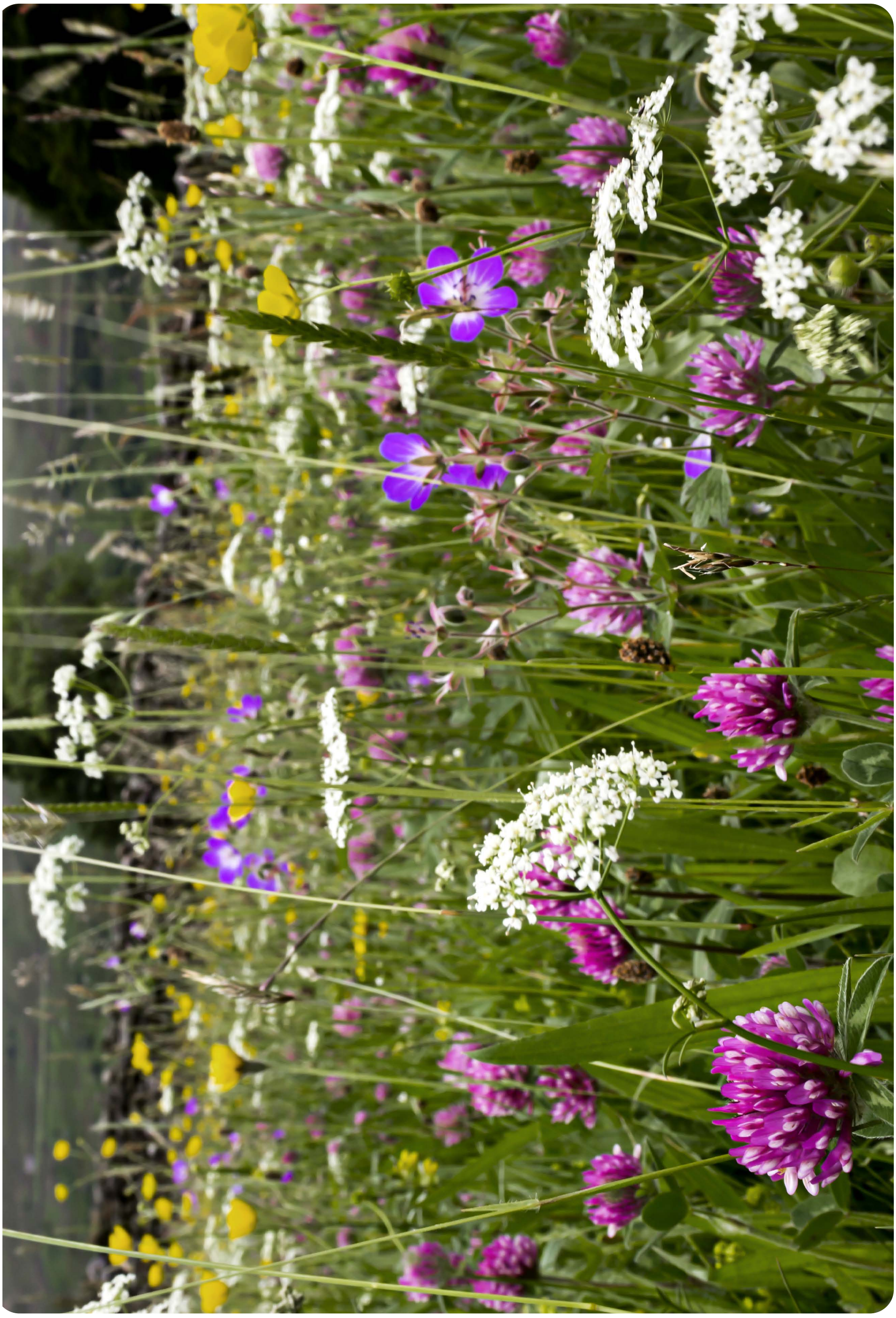


forget-me-not

foxglove

wild geranium

Resource 3C



Resource 3D

Activity 1: Are there different-coloured flowers?

Bees see colours differently to humans. Purple, blue, yellow and white flowers are good for attracting bees.

Can you find any purple, blue, yellow or white flowers? Draw them below.

Activity 2: Are there flowers with a strong smell?

Count how many different flowers you can find with a strong smell to attract bees.

Resource 3D

Activity 3: Are there flowers with marks and patterns?

Some flowers have marks shows bees the way to the nectar and pollen in the middle of the plant.

Can you find any? Draw them.

Resource 3D

Activity 4: Are there flowers with different shapes?

Flowers are different shapes. Different bees have tongues that are different lengths. This means they can get nectar from different flowers. Can you find flowers that are these shapes?

bell ☐

pom pom ☐

saucer ☐

tube ☐

flat ☐

umbrella ☐

Draw any other flower shapes you find.

Lesson

04

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

Why do we need bees?

NC Links

Living things and their 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.

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

Working scientifically: Observing closely, using simple equipment; gathering and recording data to help in answering questions

Scientific enquiry type:
Pattern seeking

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Copies of Resource 4B (one per pair or small group)

Copies of Resource 4C (one per pair or small group)

Clipboards

Magnifying glasses

Stopwatches

Optional: A range of seeds, pods and seed heads

Optional: A copy of ***Bee: Nature's Tiny Miracle*** by Patricia Hegarty and Britta Teckentrup

Adapt the learning

Children requiring additional support may benefit from an adult-led scaffolded approach to the diagram construction, where the adult is thinking out loud while placing the cards and the arrows.

Challenge children to think about a day in the life of a bee and ask: *What difference would one bee's activities make in the space of a day?*

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature

What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** from the Year 1 learning enquiry *Which is my favourite wildflower and why?* Display the images on Resource 4A (a bee on a flower, seeds, a wildflower meadow) and ask the children to work in pairs to tell the story that links all three images.

Invite them to share their ideas, address any misconceptions and draw out in discussion the narrative that bees and other pollinators visit flowers to feed and spread pollen from one flower to the next as they do so. This helps the plant make seeds, which grow into new plants. The new plants have flowers of their own.

With reference to the images, ask the children: *What would happen if you took one of the things in the images away?* Explore the idea that, without bees or other pollinators, flowering plants wouldn't be able to make seeds and new plants wouldn't grow.

What are we learning today?

Take the children outdoors to **learn in Nature** in a green space where there are flowering plants growing. This activity is best timed to take place on a sunny day when bees are more active. Share the learning question: *Why do we need bees?* Discuss the children's ideas with reference to the narrative told in the retrieval activity, establishing that bees are important for flowering plants because they help the plants to reproduce.

Introduce the questions on Resource 4B and tell the children that they will be collecting information about the relationship between bees and flowers to answer them:
Which parts of the flowers have pollen on them? Do they all look the same?
How many bees can you spot on flowers?
What are the bees doing on the flowers?
Where do the bees go next?
How many flowers does the bee visit in a minute?
Where can you hear the sound of bees?

In pairs or small groups, the children explore the green space and answer as many of the questions as they can.

Invite the children to feed back to the class what they have found and discuss how they might answer the questions, drawing on the data they have collected to support their responses. Encourage them to compare the data they have found with what other children have found and to identify any patterns. Reinforce the connection between the activity of the bees and the plant's production of seeds.

If you have access to a range of seeds, pods and seed heads, share these with the class before asking: *Where might you find seeds on a plant?* (e.g. inside a pod, a seed head, a nut or a fruit growing on the plant) *Will all the seeds a plant makes grow into new plants?* Establish that seeds and fruits also provide an important food source for animals so some will be eaten.

TEACHER TIP:
If it isn't possible to conduct this part of the lesson outdoors, the children could carry out the close observation of flowers using a selection of different cut flowers and magnifying glasses. They could draw what they observe in their Nature journals.

How are we learning today?

Share with the children the fact card about the sparrow on Resource 4C. Remind them that in the Year 1 learning enquiry *Where do we live and what makes it special?* they learned that sparrows eat seeds. Read the information on the fact card as a class and highlight that the sparrow eats dandelion seeds.

Share with the children the fact card about the dandelion on the same resource and model how to start constructing a food chain, using an arrow from the dandelion to the sparrow to show the transfer of energy up the food chain.

Share with the children the fact card about the sparrowhawk and establish that sparrowhawks predate sparrows. Model how to add this to the food chain using a second arrow. Encourage the children to use the term producer to describe the dandelion and consumer to describe the sparrow and the sparrowhawk.

Ask the children: *Why are bees important in this food chain?* (e.g. because without them there would be no dandelion seeds for the sparrow to eat. If there were fewer sparrows, the sparrowhawk might have less food, too.)

In pairs or small groups, the children use the information on the remaining fact cards to create food chains that include one animal that eats seeds or fruits.

Discuss what they've found and create the same food chains as a class alongside the first one (e.g. oak – squirrel – fox; bramble – wood mouse – tawny owl). Ask: *Why are bees important to all these food chains?* (e.g. without bees, there would be no seeds or fruit for the squirrel and wood mouse to eat; the whole food chain would be affected). Reinforce the fact that although we don't 'see' bees in these food chains, they play an essential role in them.

TIME TO EXPLAIN:
In pairs, allow the children time to take turns to use their food chain diagrams as a prompt to 'talk like an expert' about the importance of bees for the production of food for humans and for other animals.

STEM SENTENCES:
In this food chain, the producer is _____.
In this food chain, the consumer is _____.
Bees are important in this food chain because _____ .
Without bees _____ .

TEACHER TIP:
Either in this lesson, or at another point in the school day, you could share with the children the book ***Bee: Nature's Tiny Miracle*** by Patricia Hegarty and Britta Teckentrup, which works well to support this learning.

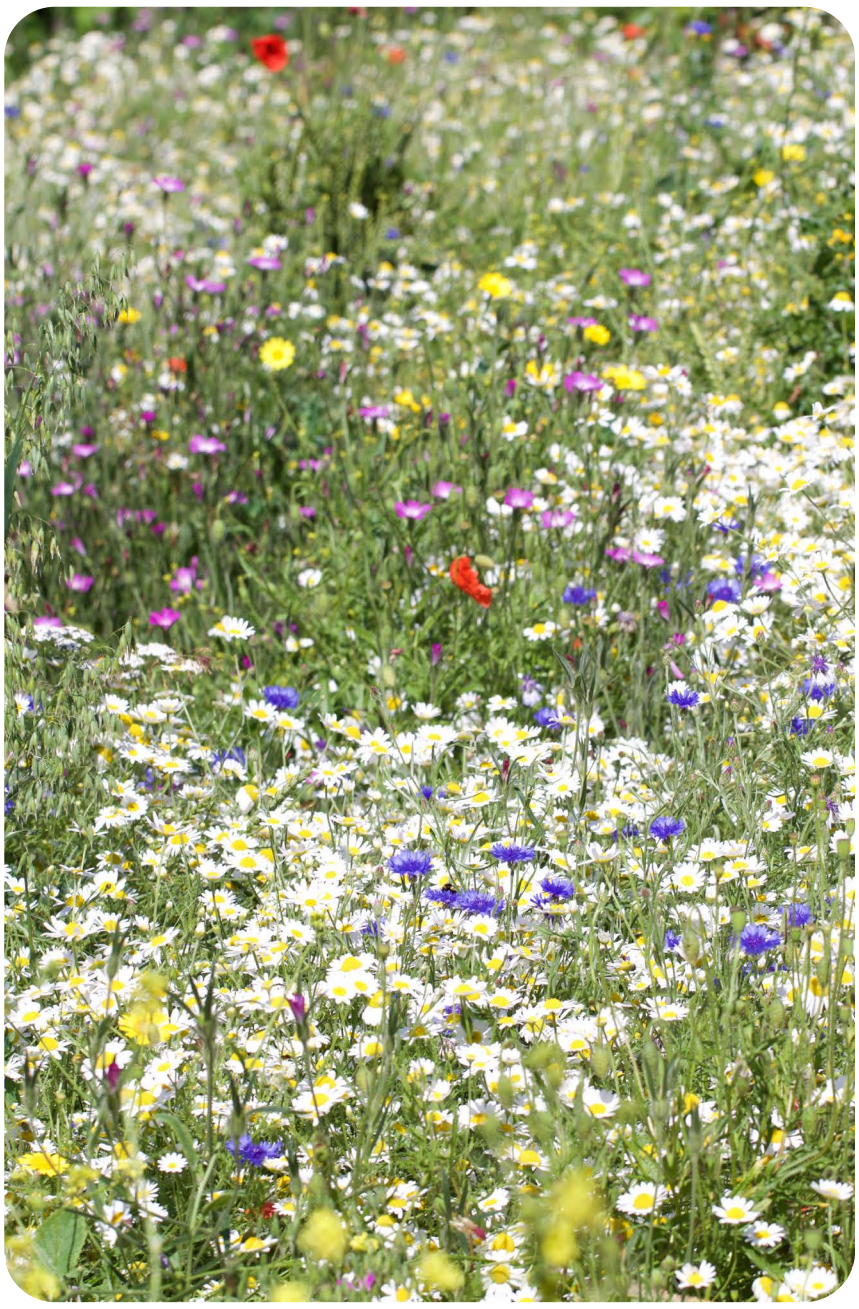
What have we learned today?

Reflect on the children's **learning about Nature** and asses their understanding by asking: *Why do flowering plants need bees? Why do the animals in the food chains we created need bees? Do people eat seeds and fruits? What would happen to our diet if there were fewer bees?* Make the link between the fruits, nuts and seeds we eat and the role of pollinators such as bees in their production.

Draw out the link between this learning and the **principle of Interdependence** by discussing the crucial role bees play in supporting other living things directly (e.g. by helping flowering plants produce seeds and reproduce) and indirectly (e.g. the seeds and fruits that flowering plants produce as a result of pollination provide an important food source for some animals, which provide a food source for other animals in turn).

This is another way that the **principle of Interdependence** reminds us that everything is connected.

Resource 4A



Resource 4B

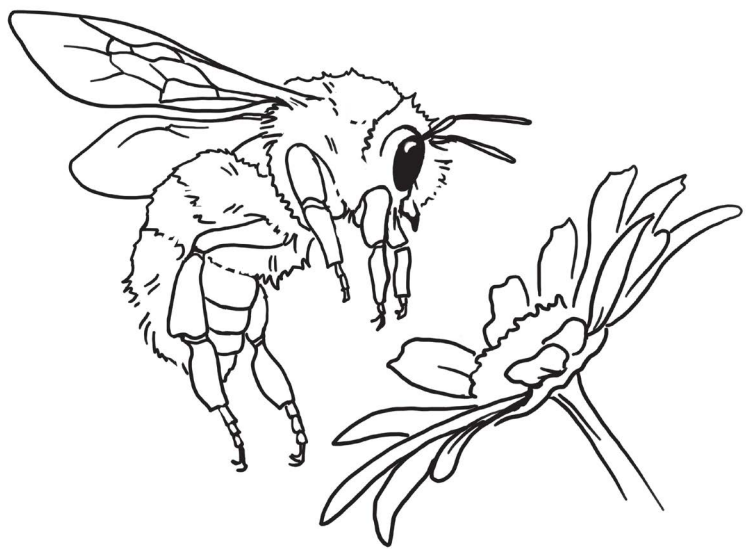
How many bees can you spot on flowers?

What are the bees doing?

Where do the bees go next?

How many flowers does a bee visit in a minute?

Where can you hear the sound of bees?



Resource 4C

sparrow

I eat dandelion seeds.
I am a consumer.

dandelion

I make my own food.
I am a producer.

sparrowhawk

I eat sparrows.

wood mouse

I eat blackberries.
Blackberries are fruit with seeds inside. They grow on brambles.

Resource 4C

bramble

I make my own food.

tawny owl

I eat wood mice.

Resource 4C

oak

I make my own food.

squirrel

I eat acorns.
Acorns are nuts with seeds inside.
They grow on oak trees.

fox

I eat squirrels.

Lesson **05**

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

What things threaten bees?

NC Links

Living things and their habitats
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.

Working scientifically:
Asking simple questions and recognising that they can be answered in different ways

Scientific enquiry type:
Research using secondary sources

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Copies of Resource 5B (one per pair)

Flipchart and marker pens

Highlighters or coloured pencils

Adapt the learning

Provide children requiring additional support with key vocabulary from the class mind map.

Challenge children to explain why the threats to bees and the declining bee population is a problem.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature; Adaptation and resilience

What do we already know?

Begin the lesson by recalling the children's prior **learning about Nature** by displaying Explorify's Start with Art 'Pollination' activity' and ask the children: *Can you describe what you see? Which parts of the flower can you see? What is the bee doing?* (e.g. gathering nectar and pollen) *What else do bees need to survive?* (e.g. food, water, shelter, a suitable habitat or microhabitat).

Allow children time to share their ideas and address any misconceptions.

What are we learning today?

Move the children's **learning about Nature** on by sharing with the children the images of the red-tailed bumblebee, white-tailed bumblebee and tree bumblebee on Resource 5A. Explain that each year, scientists monitor how many bees there are in the UK and that they have noticed that the number of bees – including these bee species – is decreasing.

Ask the children: *Why might there be fewer bees?* Encourage the children to think about their learning so far about what bees need to survive, and to suggest some threats to bees. Once they have had a chance to discuss this in pairs, take feedback as a class. By this point in the learning sequence, they might, for example, suggest that bees aren't finding enough food in their habitat or that there aren't enough microhabitats for them to nest or shelter in.

Start a class mind map about threats to bees with the learning question for the lesson in the middle and record the key points arising from the class discussion.

Introduce the fact sheet on Resource 5B and explain that the children will be using the information on it to add to their ideas about the threats to bees so that the class can answer the learning question. Read through the first section as a class and model how to highlight the key points.

Discuss what the children have found out as a class and use their suggestions to amend and add to the initial ideas recorded on the class mind map. Keep the class mind map to refer to in Lesson 6.

TEACHER TIP:
Data collected by the Bumblebee Conservation Trust highlights a 23% decline in bumblebee sightings England, Scotland and Wales in 2024. Among the worst affected bee species are the white-tailed bumblebee (down by 60%), red-tailed bumble (down 74%) and tree bumblebee (down 39%). The chemicals referenced in the factsheet on Resource 5B include pesticides containing glyphosate.

How are we learning today?

Model how to use the information on the class mind map to start creating a poster about threats to bees.

TIME TO EXPLAIN:
The children create their own posters to educate others about the threats to bees, drawing on their research and the points recorded in the class mind map. Challenge them to explain on their poster why the declining bee population is a problem, drawing on their learning from Lesson 4 linked to food chains and food production.

Once the children have completed their posters, they work in pairs to present them to another pair of children. This part of the lesson could take place outdoors to give the children the opportunity to **learn in Nature**.

STEM SENTENCES:
Bee habitats are threatened when _____ .
There is less food for bees when _____ .
The threats to bees are a problem because _____ .

What have we learned today?

Reflect on the children's **learning about Nature** by asking the children the learning questions: *What things threaten bees? How are bees' habitats changing? Why is this a problem?*

Draw out the link between this learning and the **principle of Interdependence** by discussing with the children who is responsible for these threats to bees (e.g. they are the result of human activity). Highlight the fact that once we understand how our actions are affecting bees, we can work together to change things for the better.

As a class, watch the BBC film clip The incredible secret life of London's bees to see how buff-tailed bumblebees are able to survive in the capital city. Ask the children: *Where have these bumblebees found a microhabitat in the city? Where did they find food in their city habitat?* Discuss how buildings and flowers in gardens and green spaces in London are providing bees with some of the things they need to survive. Explain that in Lesson 6, the children will be exploring some of the ways that we can help to care for bees.

A wild honeybee drinking water from moss

Resource 5A

red-tailed bumblebee

white-tailed bumblebee

tree bumblebee

Resource 5B

What things threaten bees?

Bees are very important insects. They help flowering plants to make seeds. The seeds grow into new plants and feed animals – and us! Bees in the UK are in trouble. Let's find out why.

Building on bee habitats

When people build new houses, roads and other buildings, they sometimes destroy the places where bees live. Bees make their nests in long grass, in the ground and in holes in trees. When these wild spaces are built on, bees lose their habitat. When there are fewer places for wildflowers to grow, there is less food for bees.

Using chemicals

Some farmers and gardeners use chemicals to kill weeds and insects that damage their plants. The problem is that these chemicals can harm bees, too. When bees visit flowers on plants that have been sprayed, the chemicals can make them unwell or kill them.

Disappearing hedgerows

Farms used to have lots of hedgerows and spaces where bees could find food. Many farmers have dug up the hedgerows to make bigger fields. They grow plants for food in the spaces where wildflowers used to grow. This means there is less food for bees.

Changing weather

The weather in the UK is changing and our winters are becoming warmer. This means that bees may become active too early in the year before the flowers have bloomed. If there are no flowers, the bees can't find food. Without food, bees can starve.

Bees from other places

Sometimes insects arrive in the UK from other countries on ships or planes. Some of them bring new illnesses that make our bees unwell. New bees also take food and take over habitats that our bees need.

Lesson

06

Enquiry question:
Why are bees so brilliant?

Harmony principle:
The principle of Interdependence

What can we do to help bees?

NC Links

Living things and their habitats
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

Working scientifically:
Using their observations and ideas to suggest answers to questions

Scientific enquiry type:
Research using secondary sources

Key vocabulary

Vocabulary relating to living things and their habitats, working scientifically and thinking sustainably is highlighted within the unit introduction

You will need

Flipchart and marker pens

Optional: *The Bee Book* by Charlotte Milner

Adapt the learning

Provide children requiring additional support with key vocabulary from the class list of actions.

Challenge the children to extend their ideas to show what they can do, what their community could do and what could be done on a larger scale. Ask: ***What difference would each of these actions make?***

Link the learning

CLIMATE ACTION PLAN:
Biodiversity and Nature; Adaptation and resilience

What do we already know?

Begin the lesson by retrieving the children's prior **learning about Nature** by displaying the images on Resource 2A and playing a game of 'True or False' using statements such as:
A habitat is a place where different living things live. *True (plants and animals)*
Habitats and microhabitats are the same thing. *False (a microhabitat is a small area within a larger habitat)*
All bees live in the same microhabitats. *False (highlight examples shared in Lesson 1 and why these are suited to bees' needs)*
Flowers provide a source of food for bees. *True (nectar and sometimes pollen)*
Bees will always be able to find food, water and shelter within their habitats. *Allow the children to discuss whether they believe this to be true or false and to justify their answers*

Share the children's responses and address any misconceptions.

What are we learning today?

Revisit the children's **learning about Nature** with reference to the threats to bees by sharing the class mind map from the previous lesson, or an example of a child's poster. Ask: ***What are the threats to bees?*** As a class, identify which of these threats they can do something about, and which require action by other people (e.g. the children can sow wildflowers to provide a more food-rich habitat for bees; restoring hedgerows on farmland is something that is likely to be outside their control; they may feel they can influence their parents or other adults to stop using weed killer that is harmful to bees).

Start a class list of actions the children could take, or persuade the adults around them to take, to help care for bees.

As a class, watch the Bumblebee Conservation Trust film clip 'Bee the change', which explores five simple ways we can help bumblebees, many of which would help other bees, too:
- Grow plants that flower in different seasons so there is food for bees over a longer period.
- Mow your lawn less often so plants such as dandelions can flower.
- Grow your own herbs, fruit and veg as bees love the flowers.
- Leave space for bumblebee nests.
- Inspire other people to do the same!

Pause the film at key points to discuss these ideas with the children and add them to the class list of bee-friendly actions.

TEACHER TIP:
The Bee Book by Charlotte Milner includes a section 'What can you do to help?' that would work well to support this learning. Although the children may recognise that the restoration and wildlife-friendly management of hedgerows on farms is outside their control, many farmers are now engaged in these activities as part of more regenerative and sustainable farming practices. The Bumblebee Conservation Trust's Education Resource Library includes activities that contribute towards gaining its Bumblebee-friendly School accreditation and could provide inspiration for actions to take in school.

How are we learning today?

Working in pairs or small groups, the children create their own bee-friendly action plans, setting out what they will do – and inspire others to do – to help bees. These could be shared with school leadership, the rest of the school, community groups and with their families and neighbours.

TIME TO EXPLAIN:
The children share their action plan with another pair or group. They discuss a pledge they will make, based on one of the actions in their plan, to help bees.

Take the children outside so they have the opportunity to **learn in Nature**. Sitting in a circle, invite the children to share their bee pledges.

STEM SENTENCES:
To create a bee-friendly habitat, I will _____.
To help care for bees, I will _____.

TEACHER TIP:
The children could record their bee pledges on a page in the bee books they are creating as their Great Work for the wider learning enquiry.

What have we learned today?

Reflect on the children's **learning about Nature** and assess their understanding by asking: *What do bees need to survive? What can we do to help bees?*

Support the children to make the link between this learning and the principle of Interdependence by asking them: *Why is it important to help bees? How do bees and flowers depend on each other? How do honeybees depend on each other? How do we depend on bees for food?*

Draw out the **learning from Nature** by asking the children: *What can we learn from bees about interdependence?* and discussing their ideas as a class.

Rocket hives for wild honeybees by Bee Kind Hives

Additional image credits

Resource 1A
Arctic sea ice by Patrick Kelley © 2009 Patrick Kelley, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

Resource 1B
Polar bear by Alan Wilson © 2007 Alan Wilson, licensed under CC BY-SA 3.0 (creativecommons.org/licenses/by-sa/3.0/)

Shore crab by Luis Miguel Bugallo Sánchez © 2005 Luis Miguel Bugallo Sánchez, licensed under CC BY-SA 3.0 (creativecommons.org/licenses/by-sa/3.0/)

Resource 1C
Hairy footed flower bee by Alan Shearman © 2020 Alan Shearman, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

White tailed bumblebee by Ivar Leidus © 2015 Ivar Leidus, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Red mason bee by Gail Hampshire © 2015 Gail Hampshire, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

Common carder bee by Ivar Leidus © 2015 Ivar Leidus, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Resource 1D
Mining bee nest by Rosser1954 © 2014 Rosser1954, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Resource 2A
White tailed bumblebee by Ivar Leidus © 2015 Ivar Leidus, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Mining bee nest by Rosser1954 © 2014 Rosser1954, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Tree bumblebee nest by Orangeaurochs © 2015 Orangeaurochs, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

Resource 3A & 3D
Hedge nettle by Ivar Leidus © 2013 Ivar Leidus, licensed under CC BY-SA 3.0 (creativecommons.org/licenses/by-sa/3.0/)

Yarrow by Alpsdake © 2015 Alpsdake, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Resource 4C
Sparrow by Chuck Homler © 2025 Chuck Homler, licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Wood mouse by Christian Fischer © 2019 Christian Fischer licensed under CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/)

Sparrowhawk by Caroline Legg © 2021 Caroline Legg, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

Tawny owl by Caroline Legg © 2022 Caroline Legg, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)

Fox by Peter Trimming © 2011 Peter Trimming, licensed under CC BY-SA 2.0 (creativecommons.org/licenses/by-sa/2.0/)