
spot-a-bee
ACTIVITY
BOOK
EXPLORE THE WORLD WITH BEES

Welcome to Spot-a-Bee!

Bees in our backyards

This pack is for children and their parents, guardians, grandparents, aunts and uncles who want to help bees, by looking after their homes

Bees are so important to life on planet earth. Yet the last 60 years has seen the loss of much of their natural habitat, including over 90% of the wildflower meadows in the UK. Intensive farming, pesticides, climate change and pests called the Varroa means that bee numbers have gone down in the countryside.

About Spot-a-Bee

Luckily, in our towns, parks and suburban back gardens are many trees, scrubs, plants and flowers, from around the world, that our winged friends like. At Spot-a-Bee, we want to know which of these the bees like best, so that we can plant more of them.

Spot-a-bee is a "citizen science" project and everyone can take part in collecting data, which researchers at universities can analyse and tell the world about.

Did you know?

"Bees and plants together weathered everything that time could throw at them until modern humans arrived and began 'improving' nature"

Sarah Wyndham Lewis

Spotting Bees...

All you need to do for Spot-a-Bee is to look and listen-out for bees, as they visit plants, flowers and trees

You can do this in your garden or when you go out for a walk

When you see a bee, take a photograph of the plant, flower or tree. Don't worry if the bee buzzes off while you are taking your photo (this happens!).

Then upload the photograph via the Spot-a-Bee App. You can also try to identify the flower, plant or tree and the bee for us, but if you can't, don't worry (it's not always easy!). You can keep track of all your photographs on the App and look at those that others across the UK have uploaded too.

In sharing your photographs, you will be helping us to understand how we can provide bee-friendly habitats. You'll also learn about bee-friendly plants. When you know what plants bees like, you'll also be able to plant more of them!

This little book includes fun activities that you can do at home to encourage bees into your garden or to the places you go out for a walk. There is something for everyone, whether you like writing or making things, drawing or just getting out and about!

Download the Spot-a-Bee App

IOS: apps.apple.com/us/app/spot-a-bee-spotteron/id1509849471
Android: play.google.com/store/apps/details?id=com.spotteron.spotabee

Download on the App Store

GET IT ON Google Play

Activity: Let's get to know bees!

Use a pencil to match up the bee parts to one of the descriptions below

Exoskeleton
The bees hard, outer shell

Wings
Bees have four of these and they help bees to fly

Legs
Bees have three pairs for walking & collecting pollen

Abdomen
Contains the stinger, wax glands and reproductive organs

Knees
They are nobbly and between the femur and tibia

Antennae
Used to smell, taste, hear and touch

Thorax
Legs and wings are controlled from here

Head
Contains the bees tiny, but functional brain

Proboscis
Another name for the bees tongue

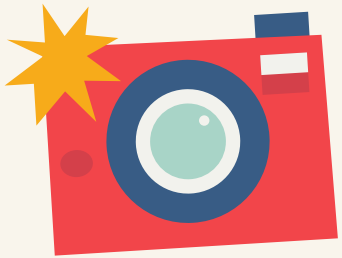
Activity:
Make your own bee!

What you need:

- A piece of paper
- Yellow and black play-dough
- Scissors and glue

How to make your bee:

- Create your play-dough bee
- Label all the parts of the bee
- Take a photograph of your bee and upload it to: @ISpotABee on Instagram, Twitter or Facebook



You will need:

- 1 cup of flour
- 1/2 cup of salt
- 2 tbsp cream of tartar
- 1 tbsp of oil
- 1 cup of boiled water
- Food colouring
- Latex gloves

Get help from an adult to make the play-dough, as you need boiled water

One we made earlier!

How to make play-dough:

1. Mix the flour, cream of tartar and salt together in a bowl
2. Add the oil
3. Divide the dough into two balls
4. Stir a few drops of yellow food colouring into half a cup of boiled water and a few drops of black food colouring into the other half cup of boiled water
5. Add one ball of dough into the yellow water and the other to the black water
6. You will need to use your hands to knead the coloured water into the dough - wear the gloves for this, as the food colouring might stain your hands
7. When the play-dough is cool, you can put it in an airtight box and store it for up to six months
8. Now you are ready to make your model bee!

Activity:

Fact -finding mission!

Your mission is to find out everything you can about bees! Write down what you find out on the next page

Questions to think about:

- How many different kinds of bees are there?
- Which countries do these different types of bees live in?
- What makes a bee different to a wasp or a hoverfly?

Some things you might not know about bees...

Bumblebees eggs are shaped like sausages

A bee can fly for up to six miles to collect pollen and nectar, and travel at 15 miles per hour

Bees live in hives made of wax, or can live in soil, wood or clay

Bees have smelly feet!

Bee facts...

Buzz-Buzz Game

What you will need:

- A six-sided dice
- Pencils
- Some friends to play with

How to play:

1. Each player rolls the dice and the first person to roll a six gets to go first
2. Each player then rolls the dice and draws the bee body part that is given that number on the dice below
3. If someone has already drawn the part for the number on the dice rolled, then the player must miss a turn

The winner is the first person to finish their bee drawing and they can shout Buzz, Buzz, Buzz!!

Draw one head

Draw a body (Both Abdomen and Thorax)

Draw two antennae

Draw six legs

Draw four wings

Draw your bee here...

Let's take a look inside the Hive

Honey bees are social and make up a colony by working together

50k

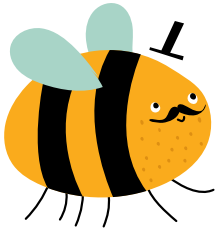
There are around 50,000 bees per hive

One hive makes about 14kg of honey

One bee has to fly about 90,000 miles - three times around the globe to make one pound of honey

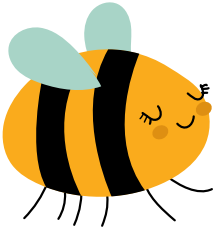
Queen Bees

- There is a Queen in every hive
- She lays between 175,000-200,000 eggs a year at a rate of 5 or 6 a minute
- Her eggs become boys or girls
- Her larvae are fed Royal Jelly exclusively
- If two Queens hatch at once, they must fight to the death



Drones

- Drones make up approximately 10% of the hive population
- They are always male
- Their only purpose is to mate with new Queens, and they are essential to the survival of future honey bee colonies
- Drones cannot sting
- They die straight after mating



Worker bees

- They are always female
- They make up approximately 90% of the hive population
- They do all the work and control most of what goes on inside the hive
- At around 21 days they leave the hive to collect pollen and nectar
- They can sting only once
- They only live for six weeks because they work so hard

Activity:

Labelling a flower

You will need:

- A flower
- A pencil
- Some glue
- A ruler

Instructions

Glue your flower in the box

Using the list below, identify parts of the flower and write the name of the part alongside:

- **Petals:** Attracts bees and insects
- **Stem:** Supports the flowers and leaves
- **Stamen:** Inside the flower, makes pollen
- **Stigma:** Pollen sticks to this bit
- **Nectaries:** Where nectar is made

Attach your flower here

What do bees eat?

Bees collect a sticky "pollen", which sticks to their bodies and is carried in baskets on their legs

Bees get their food from flowers on plants, trees, and shrubs, as well as from wildflowers

Bees use pollen for protein, and carry it between plants, this spreads the plants DNA

Bees also need water, which they drink and use to cool down the hive and to make honey

Bees drink a sugary juice from inside flowers called nectar, using the probiscus (tongue) and they store this nectar in their corps (stomachs)

Bees favourite flowers

Bees visit flowers, climbers, shrubs and trees. You might find bees visiting these plants on your windowsills, or in your garden, in parks, fields, woodlands, by canals, rivers or roadsides or even on green roofs and living walls.

Now it's time to get outside and look for plants that bees like!

Remember: if you spot any bees when you are out and about, upload your pictures to the Spot-a-Bee App!

Activity:

Making a plant identifier

What you will need:

- Scissors
- A piece of string or a ribbon
- A hole-punch

Instructions:

1. Cut out the eight tags on the next pages
2. Make a hole through the tops of them, where there is a circle on the tag
3. Thread through your string or ribbon to make your plant identifier
4. Take your identifier outside and try to find the four plants listed
5. Then, find one flower, one climber, one shrub and one tree that you think bees like and add their names to the blank tags on the next page. You can find out more about the plants using the Spot-a-Bee App or by speaking to someone who knows their plants
6. Now you have your very own bee-friendly plant identification lanyard, which you can add extra tags to when you next go out exploring!

Did you know that bees love lawn weeds like dandelions, daisies and clovers? So, perhaps it's good to use the lawn-mower less often, or to leave a patch on the lawn to go 'wild'

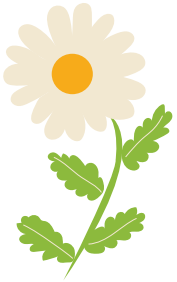
Look out for the flowers, climbers, shrubs and trees on this page

Shrub: Bramble (Wild Blackberry)

Height: Up to 2.5 m
Flowers: May - June
Where you find it: Gardens in hedges, on roadsides, by canals and rivers

Flower: Oxeye Daisy

Height: Up to 1 m
Flowers: June - August
Where you find it: Gardens; Roadsides; Wildflower meadows



Tree: Horse-chestnut (Conker) Tree

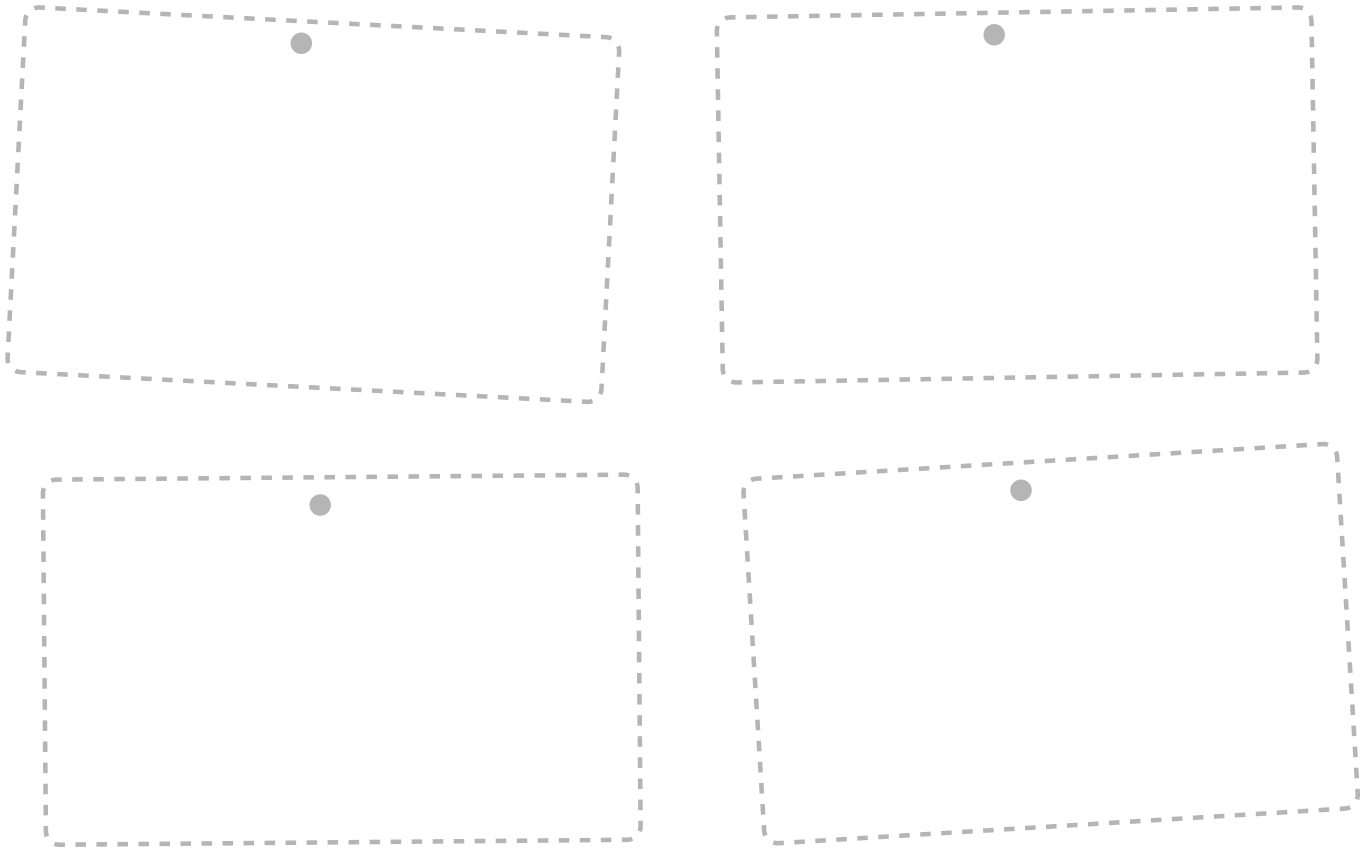
Height: Over 10 m
Flowers: May
Where you find it: Parks, gardens and streets

Climber: Common Ivy

Height: 8 to 12 m
Flowers: September - November
Where you find it: House or garden walls, on banks and slopes


HONEY

Your blank identifier tags




HONEY

Bee Places...

Bees are under threat because of diseases, loss of habitat, climate change and the use of pesticides.

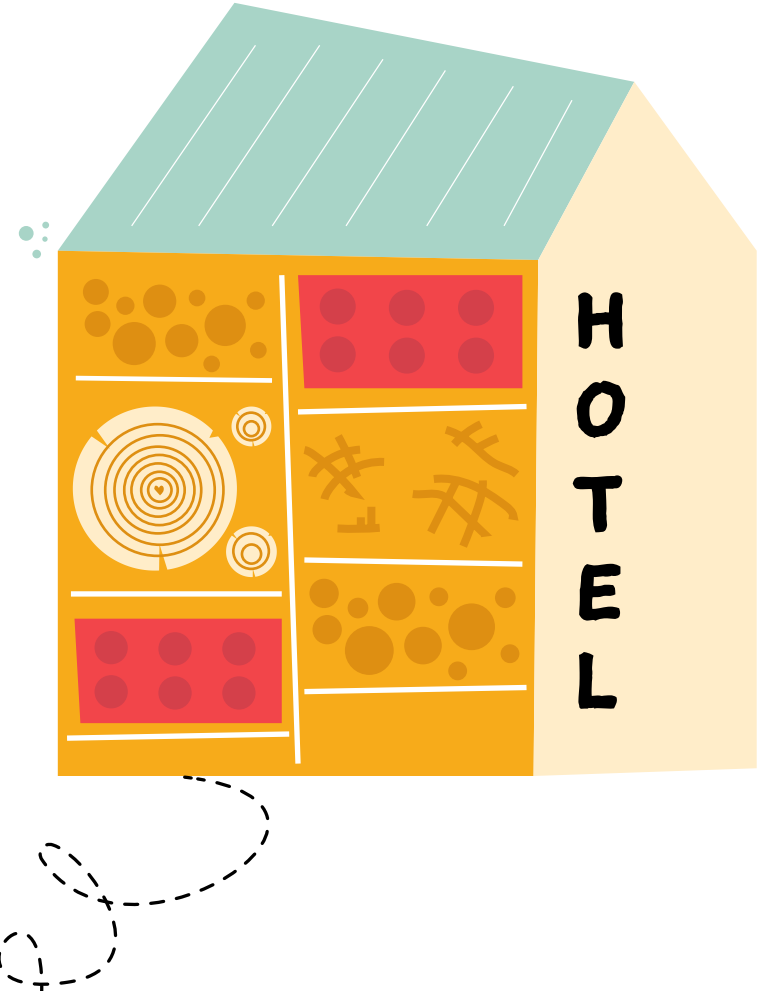
When bees lose their natural habitats, they lose their important food and nesting sites.

What can we do to help?
We can create nesting (and resting!) sites for bees.

Activity:

Make a Bee Hotel

Friends of the Earth have created a guide for how to build a bee hotel on their website:
www.friendsoftheearth.uk/bees



Become a Bee-Monitor!

Now that you know all about bees and their habitats, you could start to monitor which kinds of plants bees are visiting most in your garden, local park, woodland or in fields near your house. You might even see bees buzzing around the plants that grow out of pavements, or on road-verges.

The Spot-a-Bee App:

How to get started

What you will need:

- A mobile phone or a tablet
- To have downloaded Spot-a-Bee from the App Store or Google Play Store and to have created your own account

Download on the App Store

GET IT ON Google Play

Go out into your garden or go for a walk, look and listen out for bees.

If you see a bee buzzing around a plant, flower or tree, take a photograph! It can be quite tricky to get the bee in the photo, as they move quickly, so don't worry if you only take a photo of the flower.

Log-in to the Spot-a-Bee App and upload your photograph

- **Fill in as many of the boxes as you can.** We want to know where you saw the bee, and what you think the bee and the plant, flower or tree is called. Don't worry if you're not sure
- **Submit your first photograph and save it**. You can log-in to the App anytime to see the photographs you have taken
- **Keep track of all your photographs.** Use the App as an album and look at photographs that other people have uploaded
- **Share your photograph by social media.** Using the hashtag: #spotabee to share your photos with us on our Instagram, Twitter or Facebook **@ISpotABee**

Honey Buns

Always make sure you have an adult with you when using an oven.

What you will need:

- Greaseproof paper
- A baking tray
- A pastry brush
- A mixing bowl
- A wooden spoon

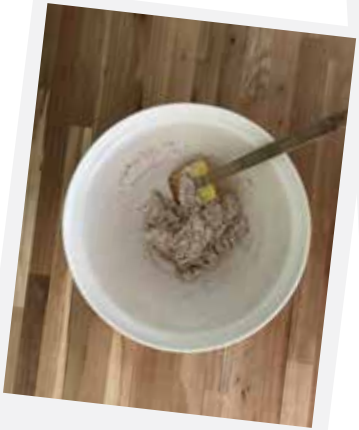
Ingredients:

- 250grams plain flour
- 1tsp Yeast
- 1tsp caster sugar
- 1tsp salt
- 150ml warm water
- Sesame seeds
- Honey

Method:

1. Mix the flour, salt, sugar and yeast together
2. Add the warm water
3. Mix into a firm dough
4. Knead the dough with your hands for 10 minutes (don't shy away from this!)
5. Divide the dough into four equal balls
6. Roll each ball into a "sausage"
7. Make the sausage into a ring
8. Place each ring on greaseproof paper
9. Brush the rings lightly all over with honey, using a pastry brush
10. Cover each ring with sesame seeds
11. Allow the rings to rise for 45 minutes or until they have double in size
12. Bake at around 190°C for 12 minutes or until starting to brown

Enjoy with a cup of tea!



Mix the flour salt and yeast in a nice big mixing bowl

Knead the dougn for 10 minutes with your hands!

Make your four equal balls into a sausage and make rings

Bake your buns until they start to brown

Grow your own wildflower meadow!

We've sent you a packet of wildflower seeds, made up of 15 plants that bees love, these are **Common Knapweed, Corn Marigold, Oxeye Daisy, White Campion, Dandelion, Corn Poppy, Corn Chamomile, Cornflower, White Clover Native, Bluebell, Yarrow, Yellow Rattle, Viper's Bugloss, Lady's Bedstraw and Red Campion**

Sow your wildflowers and watch them grow

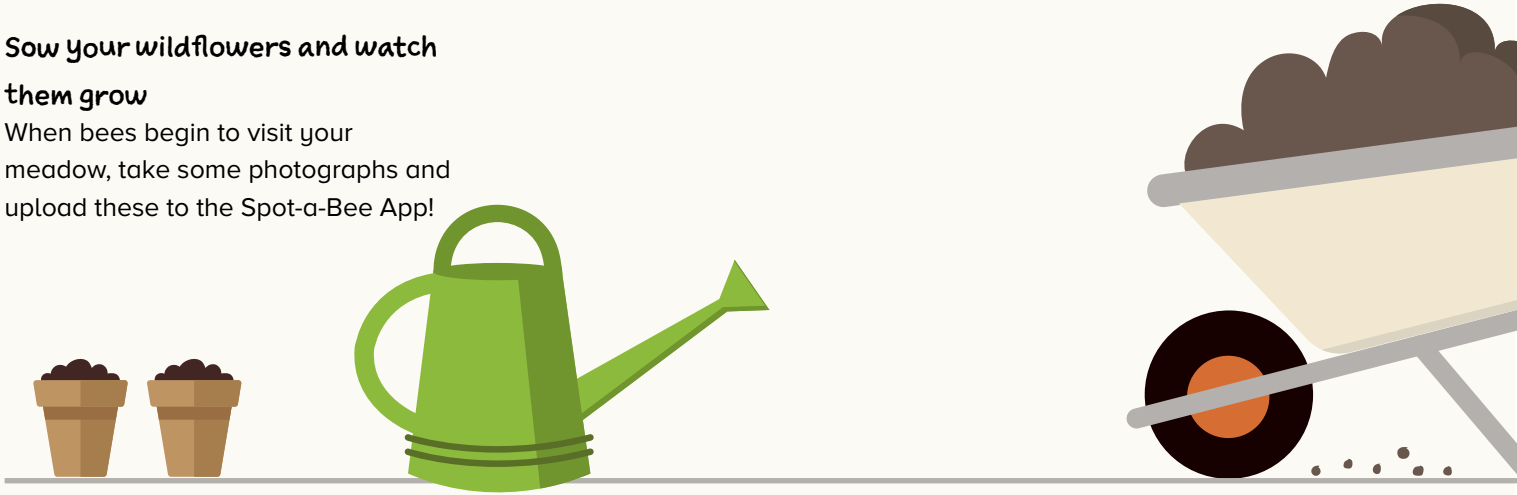
When bees begin to visit your meadow, take some photographs and upload these to the Spot-a-Bee App!

Sowing your wildflower meadow, what to do:

- Choose a growing area around $1m^2$
- Take out all weeds, grass, and other plants
- Rake over the soil
- You can sow your seeds throughout most of the year. The months of March, April, August and September are best
- Now spread your seeds over the whole patch using your hands
- You could also plant your seeds in a pot. If you do this, fill pot with soil, and rake in the seeds

A note: If your pot is smaller than $1m^2$ split your seed packet

- Once the seeds have been sown, rake the area to mix the seed into the soil, so that they are half a centimetre under the soil
- Then step (lightly!) on top of the soil or press with your hands



Weed often!

In the first year after sowing, weed control is important. If you spot them, pull them out by hand. Be sure to pull out the roots as well, as many weeds can grow back from roots only.

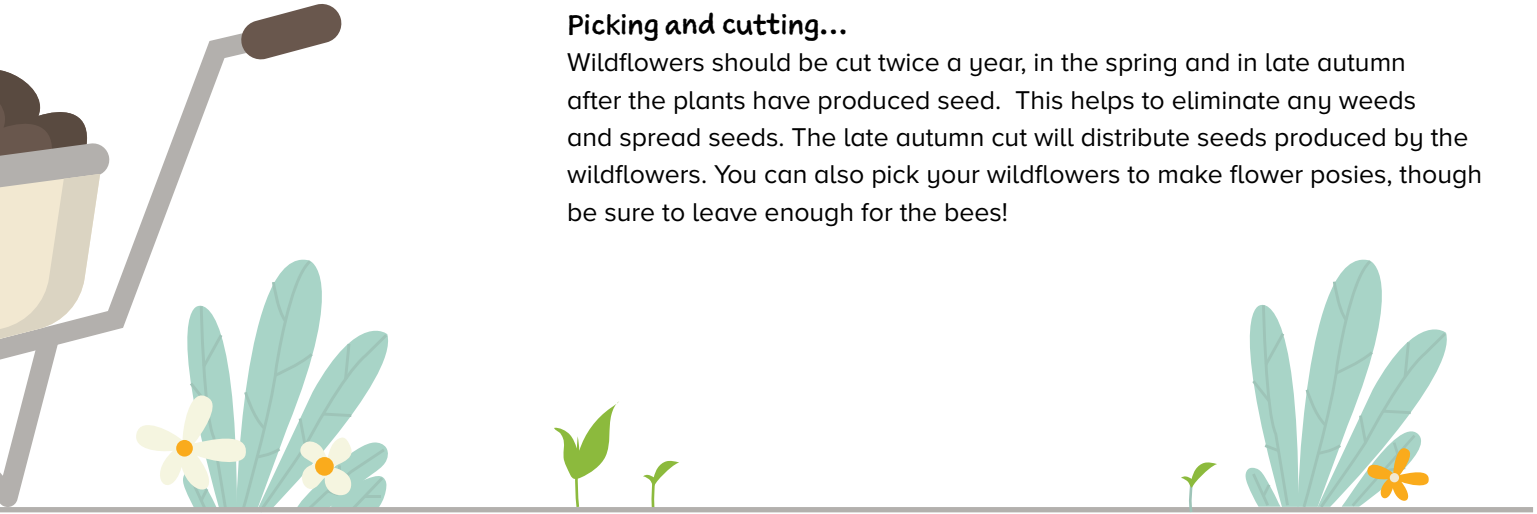
Remember, a weed is simply an unwanted plant. People think dandelions are weeds, but bees like them. If you like any of the weeds that show up in your growing area, feel free to keep them!

Water now and then...

If it doesn't rain for a few days, be sure to water your wildflowers.

Picking and cutting...

Wildflowers should be cut twice a year, in the spring and in late autumn after the plants have produced seed. This helps to eliminate any weeds and spread seeds. The late autumn cut will distribute seeds produced by the wildflowers. You can also pick your wildflowers to make flower posies, though be sure to leave enough for the bees!



Activity:

Bees need water too!

Did you know that bees need water to cool their hives, but they can't store it in the hive? Bees forage for water, in ponds and other places

Even if you don't have a pond, you can still help bees collect water!

What you will need:

- A bowl or container
- Some pebbles
- Rainwater - you might have a water-butt in your garden, if not, just collect some water in your container on a rainy day

Instructions:

- Fill up your bowl or tub with the pebbles, then add the rain water and there you have a mini pond!

Some bee and plant words you might not know!

Biodiversity: The variety of plant and animal life in the world

Conservation: The preservation or efficient use of resources,. Often a plan for avoiding the unnecessary use of natural materials such as wood, water, or fuel

Crop: The stomach of a bee only used for honey storage

Ecosystem: A biological community of interacting organisms and their physical environment

Extinction: The termination of an organism or a species. The moment of extinction is generally considered to be the death of the last individual of the species, although the capacity to breed and recover may have been lost before this point

Habitat: The place where an organism or a community of organisms lives, including all living and non-living factors or conditions of the surrounding environment

Organism: An individual animal, plant, or single-celled life form

Pesticide: Chemicals that are used to kill pests, including insects, rodents, fungi and unwanted plants (weeds). Pesticides are used to kill pests that carry disease, such as mosquitoes, and in agriculture, to kill pests that damage crops

Pollination: The act of transferring pollen grains from the male anther of a flower to the female stigma

Scientific Name: A name used by scientists, often consisting of the genus and species. Scientific names usually come from Latin or Greek. An example is Apis Mellifera for honeybee

Solitary Bee: Of around 250 species of bee found in the UK, most are solitary bees. Unlike honeybees and bumblebees, solitary bees don't live together in colonies. A solitary female bee makes her nest alone

Find out more about bees and plants!

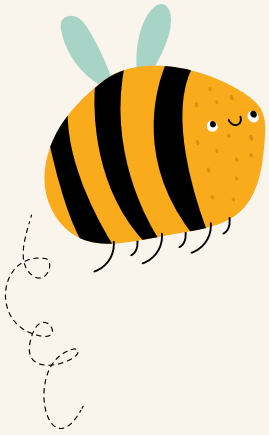
For more information on plants, bees and pollination:

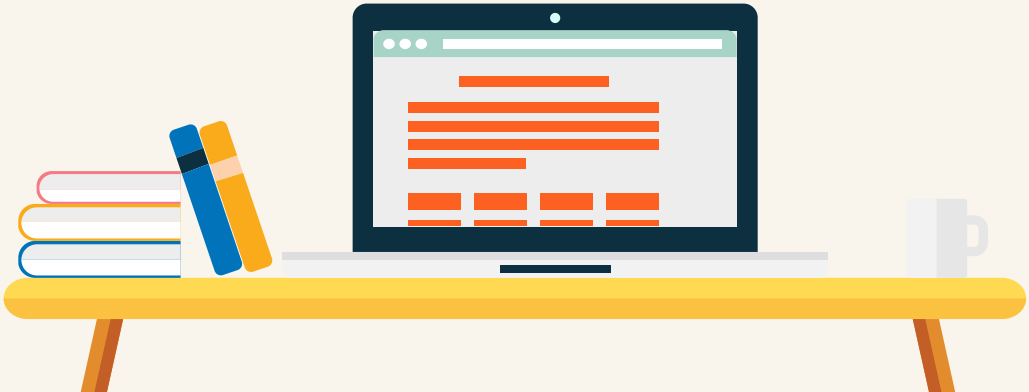
www.bloomsforbees.co.uk/id-guide/
www.opalexplorenature.org
www.polli-nation.co.uk/
www.rhs.org.uk/science/conservation-biodiversity/wildlife/plants-for-pollinators
www.sciencesessions.wixsite.com/sciencesessions
www.wildflower.co.uk

For how to make a bee-hotel:
www.friendsoftheearth.uk/bees

Bee charities:
www.bbka.org.uk
www.planetbee.org
www.bumblebeeconservation.org

Nice bee books:
Borodale, S. (2012) Bee Journal, Vintage, London
Teckentrup, B. (2016) Bee: Natures Tiny Miracle, Little Tiger Kids, London
Wyndham Lewis, S. (2018). Planting for Honeybees, Quadrille, London





Your notes...

Your notes...

Your notes...

Keep in touch!

Through Spot-a-Bee, we want to build a community of bee spotters across the United Kingdom

We'd love to hear about your experiences of looking for and listening to bees


lSpotABee


www.facebook.com/spot.abee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www.spotteron.com/spotabee

Thanks to the third year of the Master of Education at University of Glasgow, whose ideas informed the activities in this book.

University of Glasgow

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spot-a-bee
MAPPING THE URBAN BEE GARDEN