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The Bzzy Bee Challenge

Introduction for teachers

Welcome to the Bzzy Bee project, a new outreach project run by Worcestershire Wildlife Trust.

Who is Worcestershire Wildlife Trust?

We are one of 47 Trusts across the UK. We work to restore and connect people with local green spaces within their community. We manage 75+ nature reserves across Worcestershire and are one of the leading experts in outdoor learning in the county, our education service having run for more than 30 years.

What is the aim of the Bzzy Bee Challenge?

Honey bee decline has been well documented in the media and most people have a basic awareness of the threats to our honey bees. What are less well known are the challenges facing our wild pollinators and, in particular, wild bees.

Wild bees are effective pollinators and we need a healthy community of all sorts of bees to ensure that effective pollination of plants and food crops continues.

Through this project our wildlife aims are to:

- 1. raise awareness of wild bee decline
- 2. help children to learn about some of the amazing wild bees they've probably never heard of before
- 3. show that we can all make a difference through the pupils designing and implementing their own wild bee project in school

We also want the project to have curriculum and skills outcomes for the pupils involved. We will focus on:

- . Increasing knowledge about living things and habitats
- . Leadership
- Communication









Why are wild pollinators including wild bees in decline?

What are wild pollinators?

- 1. Wild pollinators are insects that complete pollination of plants and crops in urban and rural areas and that are not managed by humans.
- Wild pollinators include butterflies, moths, hoverflies, some types of beetles, and 250 + species of wild bees.
- 3. Honey bees are managed by humans and are considered domesticated bees.

Why are wild pollinators declining?



- 1. Loss of habitat that is suitable for pollinators.
- 2. Loss of wildflowers and diverse food sources.
- 3. Use of harmful chemicals (pesticides and herbicides).



How has this happened?

Pollinators are pretty much like humans in that they need somewhere to shelter and something to eat. The decline of wild pollinators can be linked to the intensification of agriculture and to urbanisation, which has led to the loss of habitats that provide food. For example, since the 1930s 97% of our wildflower meadows have been lost and the use of herbicides that kill off many wildflower has also increased.

Why should we protect wild pollinators including wild bees?

- 1. Having a diverse range of pollinators creates a stronger community of pollinating insects, which means they will be more resilient to changes such as climate change.
- 2. They are responsible for every third mouthful we eat. They pollinate crops containing essential nutrients, such as fruits, beans and vegetables.
- 3. Their pollination services are free; without them, pollinating our crops would become a very expensive and time-consuming task.

Why have you chosen to focus just on wild bees?

In the last 50 years over half of UK wild bee species have declined. The recent European Red List for Bees shows that one in ten wild species in Europe are facing extinction.

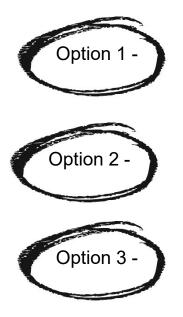
What is Worcestershire Wildlife Trust doing?



At Lower Smite Farm, our headquarters, we are working to show how farms can be part of the solution and not the cause of problems for wild bees. We are working with 20 other farms to create habitat for wild bees. Through this project your pupils will follow the same framework as farmers in improving an area for wild bees, although in a simplified format.



This is a multi-purpose pack. Choose from one of the following options :-



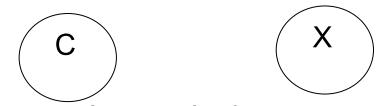
Schools which are part of our intensive outreach project in Worcester and will be running a bee project in school with Worcestershire Wildlife Trust

Other schools who want to lead a bee project in their own school

Schools who just want to do a few simple activities in the pack

If you have chosen option 1 or 2 -

You can follow the pack through each step. There are two levels of project you can do: either core or extended. Look for the core and extended symbols to guide you.



If you have chosen option 3 -

Look for pull-out stand-alone activities and head to the 'Your Project Pack' page (pg.3) and look for the resources that have your relevant key stage marked against them.



Bee project checklist

Core project - if you are short of time, or want to start small, then this is the project for you.

CHECK

Complete the simple bee health check and simple plant hunt. You will look for a variety of habitats and some key plants to see if you have them in your grounds.

At the end work out your score which will tell you how well your grounds are doing for bees.

Take photos as you go and build a photo map of good and bad places for wild bees in your school grounds.

CHOOSE

Split into teams and choose a wild bee you would like to help. Use the 'Help me!' bee cards.

In teams create posters explaining why we should help each bee. Have a debate and then vote.

CREATE

From your photo map choose a 1m square area and pledge to) improve it for wild bees. This size of your patch can be your measureable factor.

Use the simple plant list to create a food habitat or make bee hotels to create new nesting places. Put your plan into action. Use the planning sheets to help.

CHAT

Do a school assembly to tell the rest of school what you are doing.

Tell the head or governors to about your project by letter or video.

At the end of the project, as a team, decide went well and what didn't.

Extended project – If you have more time, or want a bigger challenge, choose our extended project.

CHECK

Complete the simple bee health check. You will look for a variety of habitats and some key plants to see if you have them in your grounds.

Become plant explorers and check out in more detail wildflowers or a hedgerow in your school grounds to see how well it's doing as a habitat for bees.

At the end you will get a score which will tell you how well your grounds are doing for bees.

Take photos as you go and build a photo map of good and bad places in your school grounds.

CHOOSE

Decide which wild bee you are going to help using the 'Help me!' bee cards. Split your group into teams and give each one of the bees to go and research.

Come back together and debate which bee you should choose to help.

Get the whole school involved through an assembly and have a school vote to decide which bee you should help.

CREATE

Pledge a patch! From your photo map decide which area (or areas) you are going to improve for bees. Research and decide what will you do and what your measureable factor will be - eg: number of bee hotels built or flowers planted. Put your plan into action. Use the planning sheets to help.

CHAT

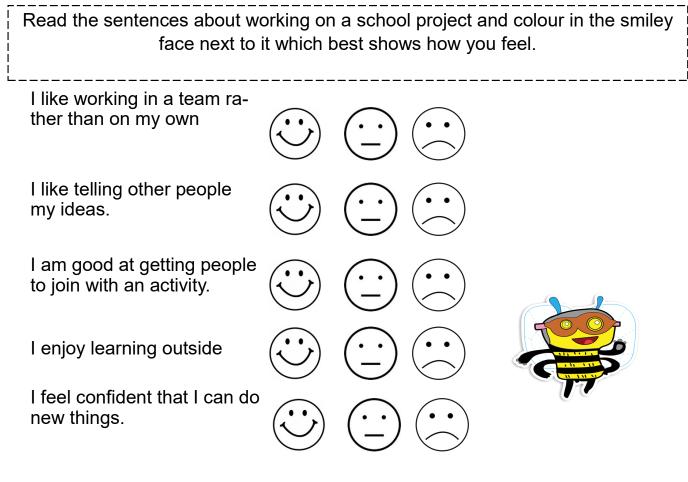
 $\overline{\mathbf{A}}$ Do a school assembly to tell the rest of school what you are doing.

Tell the head or governors about your project by letter or video.

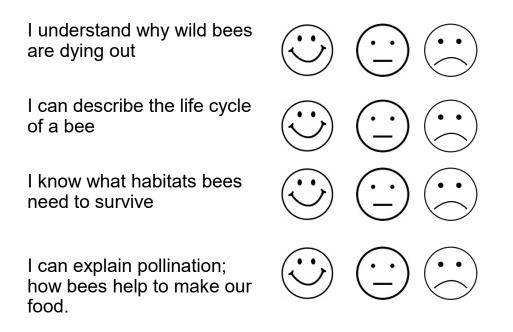
At the end of the project, as a team, decide went well and what didn't.

Your school bee team - starter survey

At the start of the project do this survey with your bee team to record how every person in your team feels about what they can do and what they know about wild bees. You will repeat survey this at the end too.

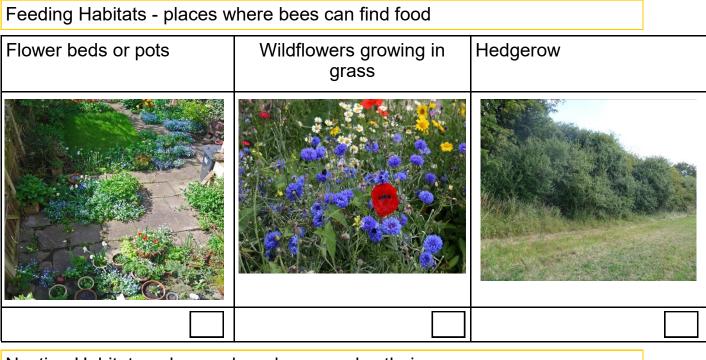


Read these sentences about what you know about bees. Choose the smiley face that best shows what you know. There are no wrong or right answers.



Simple Bee Habitat Check

Explore your school grounds to see if you can find habitats that are good for bees. Score 1 point for each habitat you find.



Nesting Habitats - places where bees can lay their eggs

Bare ground	Man-made homes	Short grass

Bonus places that are great for bees! Pond with flowers Fruit trees Veg patch Image: Comparison of the state o

© WWT, Christine und Hagen Graf, Jacky, Anna Williams

Simple plant hunt Look in the three different places listed to see if you can find these key plants. Give yourself one point for each plant you find.

С

		Self heal		Elder		Mahonia	
Plant 3							
Plant 2		Dandelion		Bramble		Lavender	6/
Pla		Danc		Brar		Lave	Total score
-		er				se	
Plant 1		Clover		Ivy		Primrose	
Where to look	Field		Wild places		Flower garden		11



Plant Explorers!

Teachers' instructions

Plant Explorers - school field looking for wildflowers

1. What plants are you looking for? Wildflowers (flowers that grow in and amongst grass).

2. What will you use to help identify the plants? Use the wildflower ID sheet (see appendix) to help you look for the wildflowers listed opposite and the teacher copy of the playing field FSC guide.

3. Choose an area to explore and measure out a 10m² patch.

4. Divide into teams each with a playground hula-hoop. In your patch get each team to place a hoop down onto the grass at random and search for the plants opposite.

5. Tick off each plant as you find it. If you don't find it, that is ok. You are doing this exploration to see how many plants you have and to see if you can improve it for the wild bees.

Plant Explorers - hedgerow

1. What plants are you looking for? A hedgerow (or hedge) is a natural barrier between different pieces of land. It can usually be found growing around the edge of a field. It is made up of tall trees, smaller bushes and wildflowers growing at the bottom of the hedge.

2. What will you use to help identify the plants? Use the hedge ID sheet in the appendix.

3. Choose a section of hedgerow to explore. Measure out a 20 - 30m line along the hedge.

4. As a team walk along this line and search for the plants below.

5. Tick off each plant off as you find it. If you don't find it, that is ok.

Work out how well the habitat scored -

Score 3 points if you found 6 or more of the plants listed

Score 3 points	
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Score 0 points if you found less than 6 of the plants listed.

Score 0 points	

Plant Explorers - Wildflowers!



Area of exploration - school field

Your quest - to find out how many different wildflowers are growing on your school field.

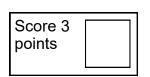
Purpose - wildflowers provide nectar (food) for wild bees. The more wildflowers you have the better your field is for bees.

- Tick off each plant as you find it. If you don't find it, that is ok.
- You are doing this exploration to see how many plants you have and to see if you can improve it for the wild bees.

Wildflower targe	t list!	
Name of plant	Is it present? Tick if it is.	
1. Daisy		43
2. Dandelion		
3. Ribwort plantain		
4. White clover		
5 Red clover		
6. Meadow buttercup		
7. Yarrow		
8. Silverweed		
9. Selfheal		
10. Common knapweed		
11. Thistles		
12. Pineapple mayweed		

Work out how well your patch of grass scored for wildflower plants.

Score 3 points if you found 6 or more of the wildflower plants listed



Score 0

points

Score 0 points if you found less than 6 of the wildflower plants listed.

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Plant Explorers - Hedgerow!

Area of exploration - hedgerow

Your quest - to find out how many different plants that are good for bees make up your hedgerow.

Purpose - wildflowers, shrubs and trees provide nectar (food) for wild bees. The more of these you have the better your hedgerow is for bees.

• Tick off each plant as you find it. If you don't find it, that is ok.

• You are doing this exploration to see how many plants you have and to see if you can improve it for the wild bees.

Hedgerow ta	arget list!	
Name of plant	Is it present? Tick if it is.	
1. Ash		
2. Blackthorn		
3. Bramble		
4. Ground ivy		
5. Field maple		
6. Hogweed		
7. lvy		\neg
8. Primrose		
9. Hawthorn		
10. White dead-nettle		

Work out how well your patch of grass scored for hedgerow plants.

Score 3 points if you found 6 or more of the hedgerow plants listed

Score 3 points	

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Score 0 points if you found less than 6 of the hedgerow plants listed.



Bee habitat indicator



How good are your school grounds for bees?

Total up your scores from your survey sheets in either the core or extended project box depending on which project you are doing.

Use your score to find out how well your school grounds are doing for bees by using the bee habitat indicator at the bottom of the page.

1 — — — I	Core project	- What	is your s
1) Si	mple pollinator health check	Score	/6
2) Sii	+ mple plant hunt	Score	/9
1		Total	/15
 I I1) Si	Extended proje mple pollinator health check	ect - Wh	at is you
1	mple plant hunt	Score	/9
3) H	edgerow plant hunt OR	Score	/6
4) W	/ildflower plant hunt	Score	/6
		Total	/21

Score	Bee Habitat Indicator
0 - 6	You don't have a lot of places where bees could find food and shelter. There are simple things you can do to make more places for bees in your school grounds.
7 –13	You have a good places for bees to find food and shelter but you could improve your habitats by making them bigger and planting a greater range of plants.
14 - 20	Your school grounds are great for bees but there is always something more you could do to make them extra special.



CHOOSE - "Help me" bee cards!

C & X

Red Mason Bee		
Looks	Ginger hair	
Size	A little smaller than your thumbnail	
Nesting habitats	I need a wild area where I can find hollow plant stems and bare soil where I can collect mud to build the walls of my nest.	
Food habitat	I love fruit trees and wildflowers that grow in your school field.	
Character	Impatient and determined	



Ashy mining bee		
Looks	Grey or black hair with two silver bands on my back	
Size	A little smaller than your thumbnail	
Nesting habitats	I need grass that is cut short or bare soil so I can dig into the ground to make my nest underground.	
Food habitat	I love fruit trees and willow trees. I like flowers you can find in the garden like salvia and campanula.	
Character	Not afraid of the dark	



Red Tailed Bumblebee		
Looks	I have a black body and a red bottom	
Size	A big bee	
Nesting habitats	I nest at bottom of hedgerows by digging down into the soil or by moving into old mouse holes.	
Food habitat	I live for nearly a whole year so make sure you have a garden for me that has flowers in it in all the seasons. I like wallflowers, cosmos and sedums.	
Character	I don't like the cold (that's why I have a furry coat)	





What area of school (or habitat) are you improving?	What plants will you plant?	What nesting places will you create?	What other actions will you take to help bees in your patch?
What equipment (tools and plants) will you need?	How much will the equipment cost?	When you will create you new habitat?	Who in your team will do what?
How will you measure if you have achieved your goal to create new hab- itat? (eg: How many plants will you plant)	How will you look after you new habitat ?	Who will look after your new habitat?	How will you make sure that the people who are looking after the habitat know what to do?
			17

C & X



Helpful places to research

Use these links to find out what flowers bees like and how to make bee

Research places - There are not many good information sites specifically for children so we've tried to find the best from amongst the rest...

A good start is <u>www.wildlifetrusts.org/bees</u> or you can download The Wildlife Trusts' Bee Action Pack <u>http://</u> <u>bit.ly/2nHadRI</u>

Plants for wild bees

Urban pollinators - plants for pollinators http://bit.ly/UrbPlant

Sussex University - flowers http://bit.ly/SussFlow

Foxleas - herbs for pollinators http://bit.ly/FoxHerb

Wildseed - wildflowers for hedgerows http://bit.ly/WildFls

Creating habitat for bees

Berks, Bucks, Oxon Wildlife Trust - save our bees http://bit.ly/BBObee

Wild About Gardens - habitat http://bit.ly/WAGgra

RHS - school gardening http://bit.ly/RHSsch

Beds, Cambs, Northants Wildlife Trust - child-friendly factsheets <u>http://bit.ly/</u> <u>BCNfact</u>

Making a wildflower lawn

The Guardian - sow wildflowers <u>http://bit.ly/GuaSow</u> Wildflower Lawns <u>http://bit.ly/WLawn</u>

Information about different types of bees

Worcs Wildlife Trust - wildlife info http://bit.ly/WorWild The Wildlife Trusts - solitary bees http://bit.ly/WTsolbe Wild About Gardens - solitary bees http://bit.ly/WAGsolt Wild About Gardens - bumblebees http://bit.ly/WAGsolt Foxleas - solitary bees http://bit.ly/WAGsolt Bumblebee Conservation Trust - bumbles for kids http://bit.ly/BBCbee









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When to create your garden	March to October	
Time	Easy	
Cost	Medium	
Maintenance	Easy	

You can create a bee garden in a variety of ways -

- 1. Transform an existing flower bed into something great for bees.
- 2. Create a raised bed garden.
- 3. Plant flowers into lots of pots.

Top Tips!

1. Use the plant lists to help you decide which flowers you will plant. We have chosen plants that flower in spring, summer and autumn so the wild bees don't go hungry. You should be able to find most of these seeds for sale in big supermarkets.

2. Bigger pots are better than smaller ones as they will hold water for longer and not dry out so easily. Cut up an old jumper and put it at the bottom of your pot to hold water through the summer months.

3. Put some gravel in the bottom of your pots to help drainage, you don't want your pots to be waterlogged. If you are transforming an existing flower bed, check to see if the soil needs gravel to help drainage or compost to help the plants grow. Try the tip in Evesham for cheap soil conditioner.

Maintenance

- 1. A bit of weeding.
- 2. Water through the summer months.
- 3. Dead head plants in flowering season to let more new flowers grow.
- 4. In autumn and winter don't tidy up your garden leave some plants standing and dead heads on the plants for insects to live in over winter.

Safety

Lots of garden plants have poisonous parts to them. RHS has a list (<u>http://bit.ly/2mrzVOw</u>) of some of the most toxic which you can avoid planting. It is important to educate children to understand they shouldn't eat anything from a plant unless they are told it is ok by an adult.

Simple plant list for bees			
Plants to sow/plant in autumn or winter	Plants to sow in spring	Plants to sow in summer	
Candytuft (autumn)	Nigella	Sweet williams	
Potatoes (winter)	Poached egg plant	Coneflower	
Crocus (autumn)	Sunflower	Clarkia	
Broad Beans (autumn)	Cosmos	Nasturtium	
Peas (autumn)	Snapdragons	Forget-me-nots	

How to....

Find instructions on how to grow the above plants through this link - <u>https://www.rhs.org.uk/</u>education-learning/gardening-children-schools/family-activities/grow-it/grow



Marissa's Mum's Meadow Instructions

When to create your wildflower lawn	Sep - Oct & March -May
Time	Medium
Cost	Low
Maintenance	Medium

1. Choose you area of land

- Pick a sunny site
- Start with a small section. Between 1—5m² is a good idea. Keep it small because it is easier to do the maintenance by hand with shears.
- Mow your chosen patch if you can, but don't worry to much if you can't.

2. Buy seeds and grow them over winter into plug plants

- You can buy wildflower mixes from garden centres and even supermarkets
- If you want a good range of flowers for bees try Emorsgate (https://wildseed.co.uk/species/ category/wild-flowers) and pick five from the below list.
- You only need a tiny bit of seed for each flower you pick,1g will be enough.
- Plant them up in regular seed compost in trays or even egg cartons. Keep the soil moist and put in a greenhouse or on a windowsill in a cool room.
- Pot them on as and when you need to
- By March start hardening them off by taking them outside in the morning and taking them back in before you go home. Plant out in April.

3. Make flaps

Bird's foot trefoil	White Campion	Red clover
Ribwort Plantain	Lady's bedstraw	White clover
Common Knapweed	Creeping buttercup	Selfheal
Cowslip	Ox eye daisy	Yarrow

- Get a spade and in your chosen area cut out three sides of a square. Lever up the soil and leave where it falls. This is a flap.
- Get your plug plant and plant it into the hole you have made
- Move onto the next one, keep the flaps about 30cm apart, until all your plug plants are in
- This method is good because you take off the top soil and plant in the sub soil which is less nutrient rich . We also found there was less competition for grasses and the flap provided shade through the hot summer.

4. Keeping your meadow maintained

- Water your plants through summer.
- If the height of the grass gets taller than your flowers, get out the shears and just cut the grass around them back. Make sure you rake the cuttings off to stop the nutrients making the soil too rich.
- Don't worry too much about cutting it until the end of the growing season (July September) when you can mow it all. However, if the grass hasn't got higher than the plants don't bother.

Top tips!

Get your caretaker/maintenance team on board from the start. Invite them to come and see your plans or get the children to write them a letter. Make signs to mark out your wildflower lawn and explain how it should be mowed. Even with the best intentions, sometimes maintenance teams can forget or a

- 20
- 1. Ban any chemicals being sprayed in your wildflower lawn, they can kill off your plants!

new person can join and not know what the area is.



Improving a hedgerow

When to improve a hedgerow	Nov- March
Time	Medium
Cost	Medium
Maintenance	Easy



You can either fill in gaps in your hedgerow or create a whole new hedgerow. Simply follow the instructions below for either option.

1.Where should you do this?

Look for gaps in the hedge where you could easily add in extra hedge plants. You could also create a new hedge by planting along the line of your school fence or join up two bits of existing hedges.

2. How many plants will we need?

Measure out the length of the area where you want to plant the hedge. You will need whips (small hedge plants) planted at two foot spacings. It is best to plant in a double row.

3. Buying your hedge plants	4. What to plant?	
Buy whips with a height of 60 –90cm. Young	The best mix for wildlife!	
shrubs have a better establishment rate and are cheaper. You can buy these from -	70% Hawthorn (Crataegus monogyna)	
Crown Nurseries	15% Field Maple (<i>Acer camestre</i>)	
Coles	10% Hazel (<i>Corylus avellana</i>)	
Woodland Trust (free on application!)	5% Guelder Rose (Viburnum opulus)	
l	L	

5. How to plant a hedgerow

Step 1: You do not need to dig a big hole to plant whips. Simply insert a spade vertically into the ground and push back and forth a few times to create a V-shaped hole in the soil. The hole should be deep enough to cover the roots of the whip when it is placed into the gap. Then tread down the soil to close the gap.

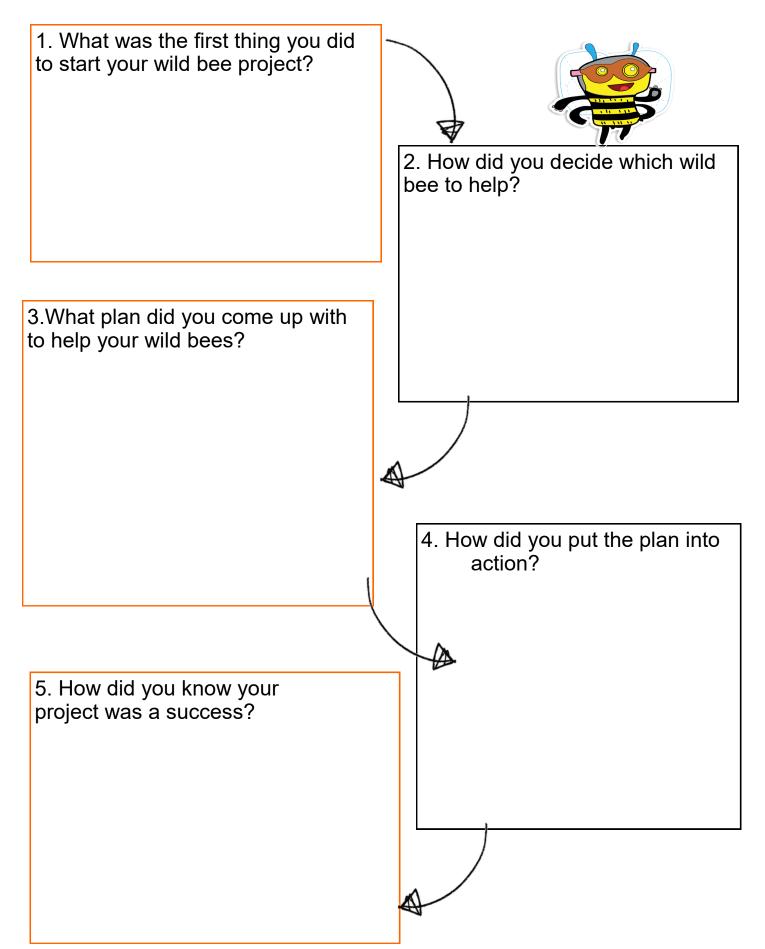
Step 2: Insert a cane next to the plant, make sure it is close to the whip. Then wrap a plastic guard around the whip and cane. The guard will protect your hedge plant from mowers and rabbits.

Step 3: Tread down the soil around the finished plant to make sure no frost can get in or pools of water can collect. After planting, water thoroughly.

CHAT - Recording sheet

C & X

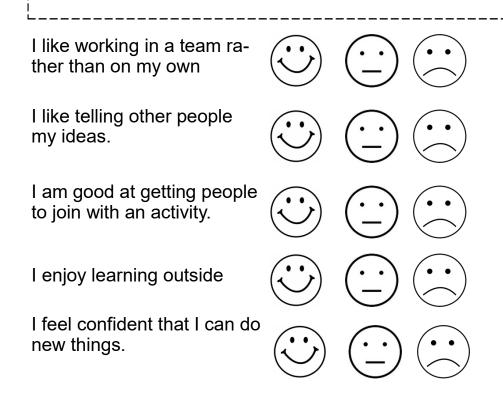
In the boxes below write or draw what you did to help wild bees. Send a copy to Worcestershire Wildlife Trust!



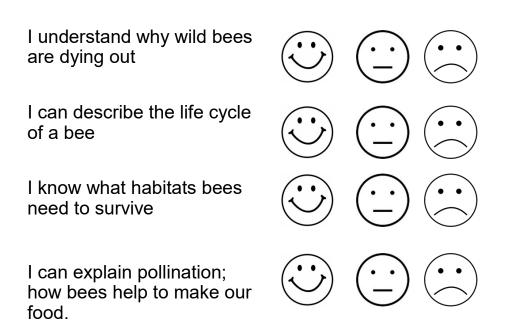
Your school bee team - end of project survey

Repeat the survey of your bee team that you did at the beginning of the project to find out what they feel they can now do and what they know about wild bees. Send a copy to Worcestershire Wildlife Trust. We would love to see if the project has made a difference.

Read the sentences about working on a school project and colour in the smiley face next to it which best shows how you feel.



Read these sentences about what you know about bees. Choose the smiley face that best shows what you know. There are no wrong or right answers.



Aubretia -

Sow from late winter to early summer, just covering the seed with peat-free compost. Make sure that the compost is moist but not wet and seal in a polythene bag until after germination which usually takes 14-21 days at 18C (65F).

Transplant when large enough to handle into boxes and then 7.5cm (3in) pots. Later plant out 30cm (12in) apart.

Poached Egg Plant

https://www.rhs.org.uk/education-learning/gardening-children-schools/family-activities/grow-it/grow/poached-egg-plant

Appendix



C & X



www.wildlifewatch.org.uk



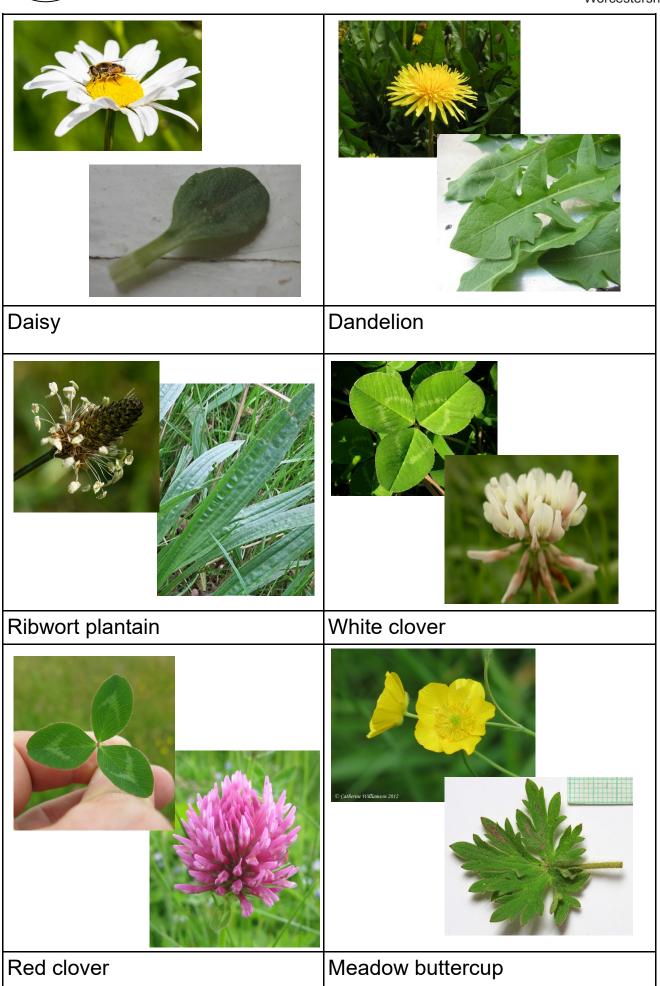


www.wildlifewatch.org.uk



Wildflower ID sheet

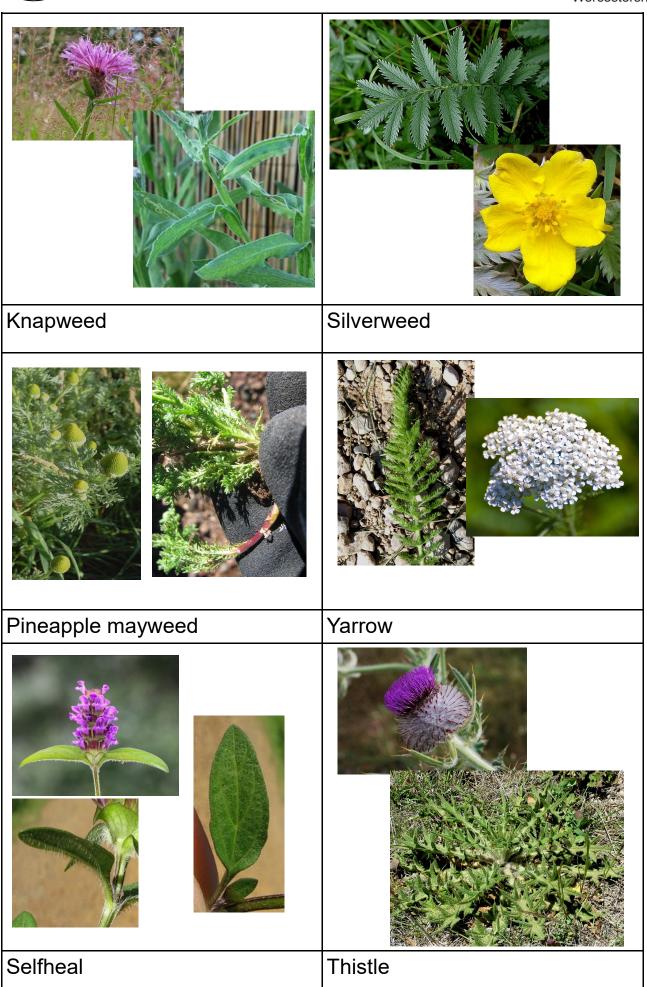






Wildflower ID sheet

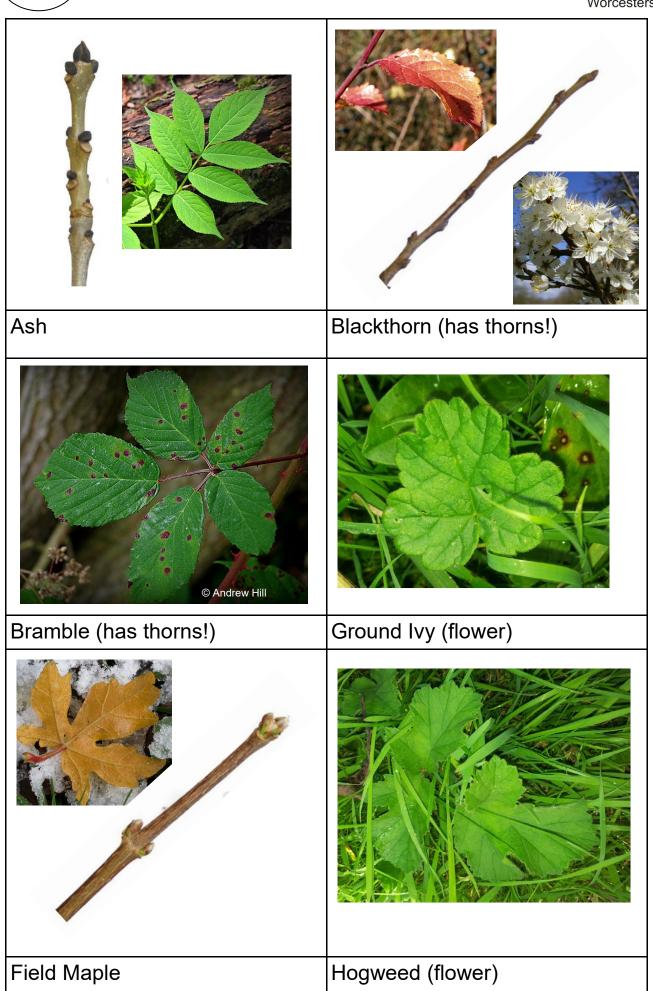


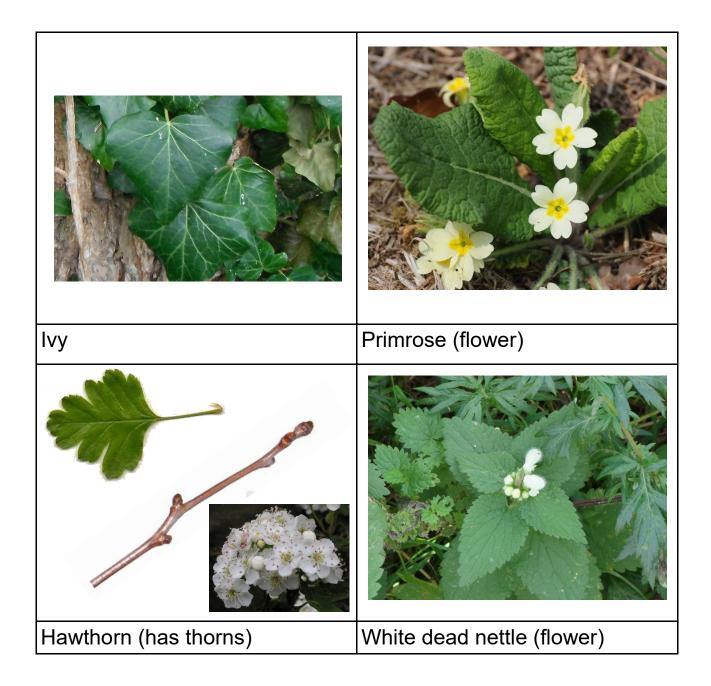


Hedge ID sheet

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Top Tips for ID!

- 1) Blackthorn and hawthorn flowers look similar. However, blackthorn flowers first in March and hawthorn flowers in May
- 2) Hawthorn and field maple both have red berries in autumn
- 3) Bramble produces blackberries in autumn



Worcestershire Wildlife Trust

Worcestershire Wildlife Trust is a local charity owns or manages more than 75 nature reserves across the county. By working with landowners, managers and communities we aim to **restore**, recreate and **reconnect** fragmented habitats to achieve a landscape where wildlife can flourish and people can live happier and healthier lives.

We are also one of the leading experts in outdoor learning in the county, our education service having run for more than 30 years.

Find out more at www.worcswildlifetrust.co.uk/for-teachers



Thank you for helping our wild bees!

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Thank you to all the photographers whose photos are used in the pack...

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