

Conservation of bees

What are the key issues affecting bees?



How can we make our school environment more bee-friendly?



Key question we will answer:

What can we learn about bees?

Key geographical knowledge we will use: Human and Physical Geography

Key geographical concepts we will use: Physical Processes and Environmental Impacts

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Key vocabulary for this lesson:

conserve

– protect something from harm

pollinator

– anything that helps carry pollen from the male part of the flower to the female part of the same, or another, flower

extinct

– when a species has been wiped out, and there are no more living

species

– a group of similar living things

colony

– a group of living things of one kind living together

herbicides

– substances used to control undesired plants, also known as weed killers

nectar

– a sugary juice that bees suck out of flowers to give them energy

pollen

– a yellow, dust-like powder from the male parts of flowers

pollination

– the transfer of pollen from the male part of one flower to the female part of another flower

reproduction

– the process that creates new life, e.g., babies, young animals or new plants

heathland

– a shrubland habitat with open, low-growing woody plant life

pesticides

– chemicals used in gardens and fields to kill pests



Let's discuss



Let's see how much you can remember from the **previous lesson!**

Discuss the **following question** with your learning partner:

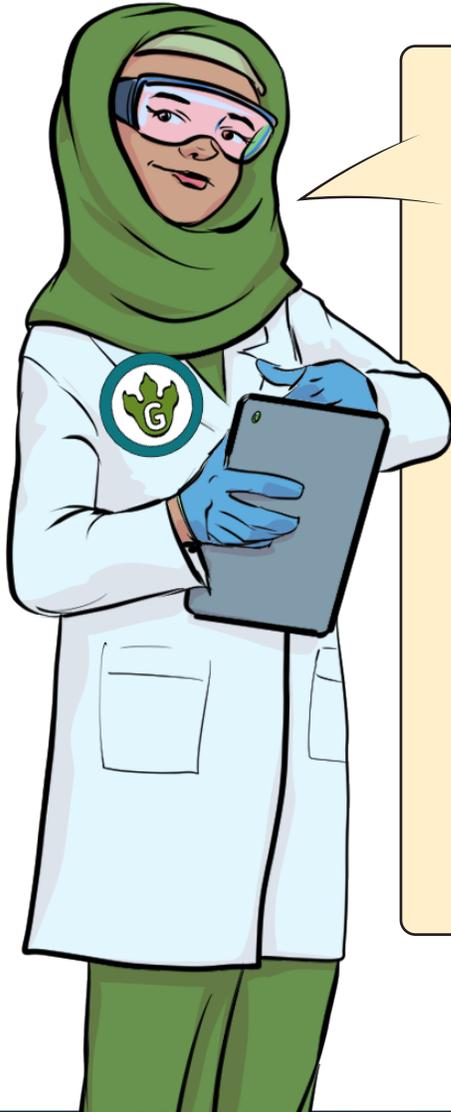
Can you remember why **bees** are so **important?**

Be ready to **share your feedback** with the class before the **answers are revealed.**



Let's discuss

answers



Hi! My name is **Lula**. I am an **environmental scientist**. I advise on **sustainability**, including waste management, recycling, flood risk and the effects of climate change as part of my job.

Bees spread **pollen** between different parts of flowers and plants, which allows them to grow **seeds and fruit**. They are the **best pollinators** among all animals to help plants to reproduce. Bees play an essential role in holding the **food chain** together: animals like frogs and lizards eat bees to survive and will eventually die if bees become **extinct**. This would affect the entire food chain. The UK population of bees has shrunk by around **one-third** in the last ten years. Many different species of bees are close to becoming **extinct**.



Let's discuss

answers



Hi! My name is **Florence**. I am a **countryside ranger**. I look after green spaces, woodlands and animal habitats as part of my job.

Bees produce a range of **useful products**:

- **honey**
- **beeswax** (used in candles and skincare products)
- **royal jelly and propolis** (used for medical purposes)

People who work with bees, such as **beekeepers**, could become **jobless** if bees become extinct.



The importance of bees

Bees are believed to be **the most efficient pollinators**, as they rely upon **pollen** and **nectar** for feeding their young. This means they may visit more flowers and spend longer searching for food than some other groups of flower visitors.

Also, bees are known to repeatedly visit **flowers of the same species**, increasing the chances of a successful pollen transfer that leads to **pollination**.



East of England region

Between **1985 and 2005**, the number of **honeybee colonies** in the UK **fell by 53%** and **wild honeybees** were considered **nearly extinct** throughout Britain.

The East of England region is one of the **richest regions for bees** due to the range of **different types of habitats** present. This is partly because many bees prefer the **warmer and drier conditions** of the region.

Of the **228** bee species in this region, **25 are threatened to become extinct**. An additional **31** species are also known as a '**conservation concern**', which means they are not as **highly threatened**, but their future is far from secure.



East of England region

Current data suggests that some of the **most important areas for bees** in the region include:

- Bedfordshire heathlands
- Breckland (Norfolk and Suffolk)
- Essex Marshes
- North Norfolk coast
- Suffolk Coast & Heaths (Suffolk)
- Thames Gateway (Essex)
- The Broads (Norfolk and Suffolk)
- Chilterns (Bedfordshire and Hertfordshire)
- The Fens (Cambridgeshire, Norfolk and Suffolk)

Protecting bees in these areas will help with **the conservation of bees** in the region and across the whole of the UK.



East of England region



In this region, the **coastline** provides a variety of habitats, including **dunes and soft cliffs**.



The heathlands (found in **Bedfordshire, Norfolk and the Sandlings, Suffolk**) support some rare bees, including the **small sandpit mining bee** and the **Bilberry mining bee**.



Wetlands, including the **Norfolk Broads** and areas of **The Fens**, are important for wetland bees, while chalk grasslands in areas including **Bedfordshire** and **Hertfordshire** also support certain species.



East of England region

As a solution to the declining number of bees in the region, a charity has stepped in to help. **Buglife** is a wildlife charity working to conserve pollinators, and they have come up with a beautiful solution to the loss of wildflowers, specifically **B-Lines**! This involves creating a series of 'insect pathways' that go across the UK, like a rail network, connecting all the good wildflower patches so pollinators can travel freely across Britain.

The B-Lines network has already been mapped in the East of England region, and it sets out a map of connected habitats for a **bee-friendly future**.

Watch their **video** here:

https://www.youtube.com/watch?v=SoCa7kpZEEY&ab_channel=Buglife



East of England region

The Norfolk and Suffolk B-Lines project will carry out the following:

- **work with landowners** to restore and create wildflower-rich grasslands
- provide **support and training** for landowners in techniques for managing grasslands
- provide **online resources** such as fact sheets
- **communicate and promote B-Lines** to a wide audience by attending events, holding workshops and local community events

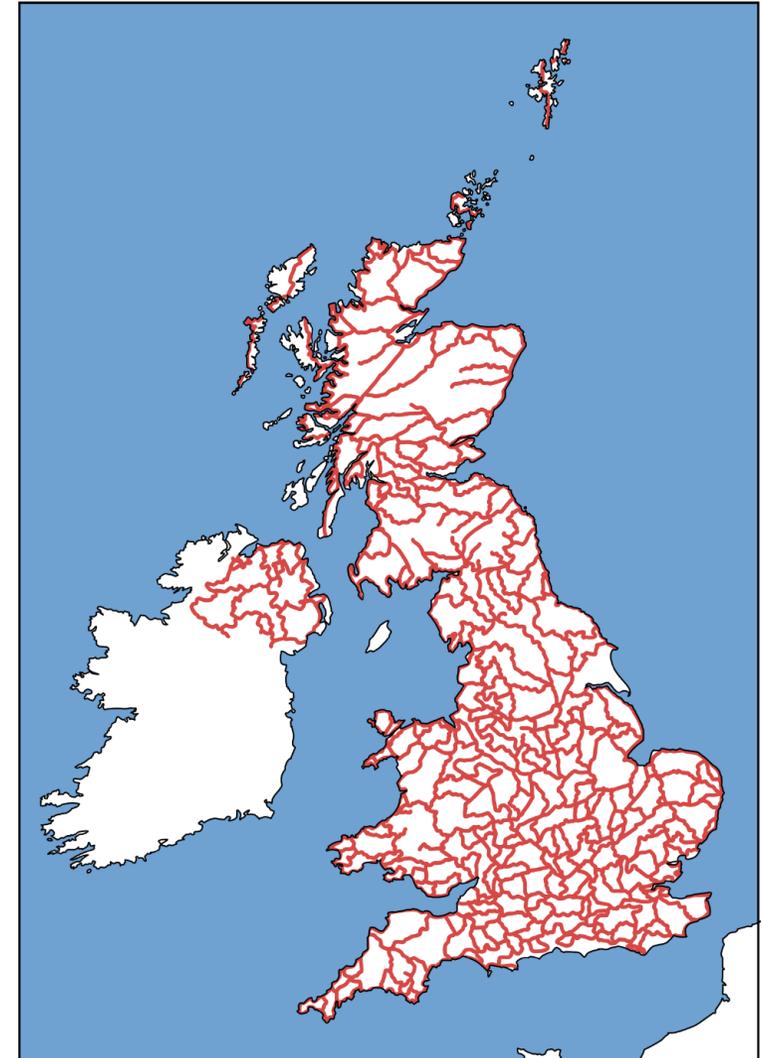


East of England region

B-Lines mapping uses special computer technology to produce a map of the **best connections between habitats**. Buglife then works with local experts to agree to a local **B-Lines network**, guided by their local knowledge of habitats and landscapes.

The best thing for our **pollinators** is to restore fields of wildflowers across the UK. Bigger is better, but everyone can help by providing **wildflowers**, and even the smallest of spaces can give pollinators room to thrive.

B-Lines aims to create and restore at least **150,000 hectares of flower-rich habitat** across the UK. Making this happen will take time and will need farmers, landowners, wildlife organisations, businesses, local authorities and the general public to work together to create **flower-rich grassland in the best locations**.



Let's discuss



Discuss the **following question** with your learning partner:

Why do you think the number of bees has **decreased** across Britain?

Be ready to **share your feedback** with the class before the **answers are revealed**.



Let's discuss

answers

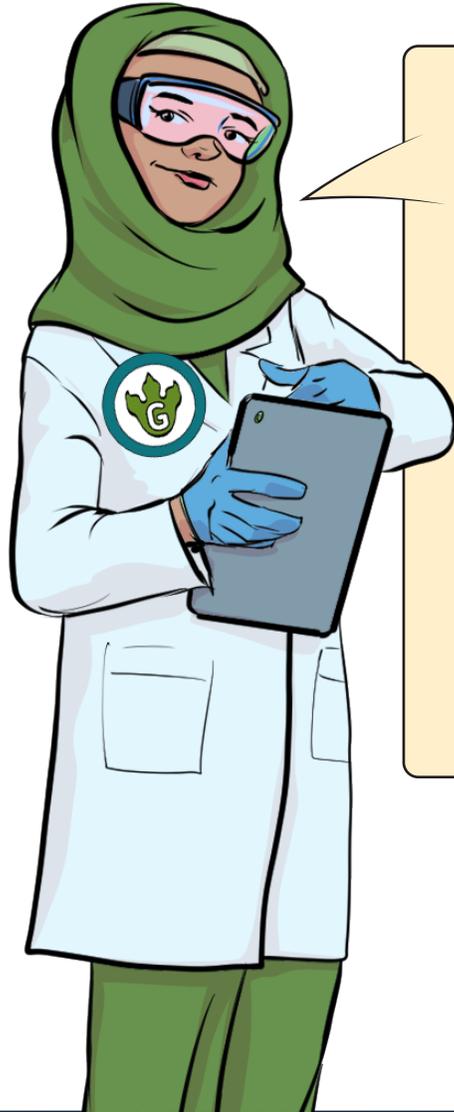
We have lost around **97% of flower-rich grassland** in the UK during the past **90 years**. Many gardens are now covered with paving, decking or gravel, so flowers cannot grow, and there is no food for bees.

There is evidence that **pesticides** (chemicals used in gardens and fields) affect how bees communicate with each other, their sense of smell, how they fly and how they hunt for food.



Let's discuss

answers



Climate change is widely predicted to increase extreme events such as **summer droughts, flooding and storms**, which could **directly impact bees**.

Even **mobile phone masts** can upset a **bee's sense of direction** as it struggles to find its way back to its nest or hive.



Changes in land use

Changes in our land use, including an increase in the building of housing and businesses, have caused significant losses of **pollinator-friendly habitats**. For bees, this means losing the wide range of **food sources** they need for a **healthy diet**.

Also, **farming methods** have changed over time, leading to the **loss of hay and flower meadows, hedgerows, trees** and other habitats such as **ponds and water meadows**.



Pesticides and herbicides



Scientists have found that **pesticide** exposure can affect how bees navigate and reproduce.

Pesticides are designed to kill **unwanted pests**, but their widespread use also harms helpful insects such as **bees**. When a bee feeds on **pollen or nectar** containing pesticides, its whole nervous system can be affected.

As well as pesticides, using **herbicides** in parks, streets and on roadside verges means that there are fewer plants that bees and other pollinating insects can seek out for **food** at different times of the year.



Climate change

As winters become **warmer and wetter**, there are signs that some wild species may be in the **wrong place at the wrong time**.

Climate change may also affect the **timing of the flowering of plants** that bees rely on for food. The **tawny mining bee** has adapted to changing climate conditions by moving northwards. Still, not all bee species can adapt so easily. Studies have shown that many would have **difficulty moving northwards**.



Bee conservation

We can ensure the **conservation of bees** by:

- planting wildflowers
- having more bee-friendly gardens
- trying to buy organic food that has not been sprayed with pesticides or herbicides
- supporting British bees and beekeepers by buying local honey
- creating a bee hotel
- spreading the word in school and the local community about ways to protect bees



Challenge



Create an **information leaflet** about the **East of England** on your challenge worksheet to show what is happening in this region.

Focus on the **decline of bees and how their numbers are being conserved**.

Key Geographical Skills: Human and Physical Geography
Key Geographical Concepts: Human Processes and Environmental Impacts

Challenge

Use the knowledge you have gained in this lesson to create an **information leaflet** to show what is happening in the **East of England region** by focusing on the **decline of bees** and how their **numbers are being conserved**. Ensure that your leaflet is **informative** and includes **colourful pictures**.

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