





Pollination is one of the most important and fundamental processes of the natural world. But what is pollination and why is it so important?

Pollination is the transfer of the pollen grain from the male part of the flower (the stamen) to the female part of the flower (the stigma and eggs). Pollination allows plants to produce fruits and seeds; and the seed has everything it needs to form a new plant. Most plants are unable to move in order to enable this pollination, so they have to employ other tactics to ensure pollen is carried from one flower to another.

Some plants rely on wind and water but the majority of flowering plants reproduce through animal pollination. The name pollinator is given to any animal that plays this vital role of transferring pollen from one plant to another. This transfer may occur whilst the animal forages for nectar (sugar), which is produced by the plant to attract the pollinator; or as it forages for the pollen itself, as pollen is a valuable source of protein for pollinators. The pollen fertilises the plant, causing new seeds to grow.

Pollinators are essential to the natural world, including humans, because:

Over 75% of the food we eat, including fruit, vegetables, nut and seeds, is produced from plants pollinated by animals:

- Over half of the world's plant oils (such as sunflower & palm oil for food, fuel, detergents and lubricants), fibres (such as cotton and
 linen) and other raw materials come from animal-pollinated plants;
- Communities of flowering plants form ecosystems and habitats that provide essential natural functions such as preventing soil erosion, reducing the impact of flooding and reducing air and water pollution.
- Most plant communities and ecosystems, including forests and grasslands play an essential role in trapping atmospheric carbon, preventing it from being released into the air (sequestration), and helping to hold back the increasing effect of climate change.

Around the world, pollinators include birds, bats, small mammals and reptiles but in the UK, all pollinators are insects. The most familiar are bees, including bumblebees, solitary bees and the honey bee. However, other insect species are equally important in the role they play including moths, butterflies, wasps, hoverflies and beetles.

Pollinator populations are changing. Many pollinator populations are decreasing in number, as are the extent of areas where they

are found. This decline is caused by a number of different factors but the biggest impact is the loss of feeding and nesting habitats. Pollution, the use of pesticides and chemicals, disease and changes in climatic patterns are all contributing to shrinking and shifting pollinator populations. These declines have started in the last 50 years and for many pollinating species, the decline appears to be accelerating.

Kent's Plan Bee is the County Council's pollinator action plan, which commits the authority to improving, where appropriate and feasible, the way in which it delivers its services and manages its estate to support pollinators in the county. The Plan also aims to encourage local communities across Kent to do their bit to improve the food sources and general habitat for pollinators in Kent; collective action is required to reverse their rapid decline.

We can all play a role in conserving these small but vital insects, and the habitats and plant communities they depend on. This Kent County Council Children's University Pollinator Challenge provides lots of activities that contribute greatly towards this – so what will you do to help?

The Pollinator Challenge Programme is broken down into three themes:

Pollinator Diary

Learn your pollinators and get spotting. Activities under this theme will help you learn about pollinators, develop your identification skills and survey techniques and ask you to record all this activity in a diary.

Plants for Pollinators

Plants to provide, and other activities you can do, to help provide food and habitat for pollinators. Make sure you read and plan ahead for planting activities because most plants take several months to grow and flower and many plants need the winter months to settle and establish their roots. Each season shows what plants you want emerging during those months but you'll want to be getting them in the ground ahead of that season. And don't worry if you don't have a garden, it includes ideas for pots, window boxes, gutter gardens and community spaces.

Get Buzzy

Things you can do to help pollinators and other pollinator themed activities, such a crafting and creativity.





Pollinator Challenge Record Sheet







Suggested activities for March to May

Like all insects, pollinators have a fascinating four-stage life cycle, which can vary greatly from species to species. Whilst the majority of pollinators have an annual life cycle, some species like the Holly Blue butterfly have two generations in one year. As the weather warms up in spring, many pollinating insects start to appear and move around. Most insects synchronise their life cycle with the flowering season of their preferred food sources, with many insects emerging as adults or caterpillars ready to feed, as flowering plants start to appear.

Pollinator Diary

This is the time to spot your first pollinator. Keep a diary of what pollinators you see emerging in spring and when. Which of the Kent young person will spot the first pollinator?

Become a UK Citizen Scientist

One simple but very beneficial way you can help, is to record what you see and send it to the UK Pollinator Monitoring Scheme (POMs) for the 10-minute Flower-Insect Times count. All you have to do is watch a clump of flowers for 10 minutes and record:

'the type of flowers

the pollinator(s) you see visiting those flowers – bumblebee, wasp, moth, solitary bee etc.

how long it visited for

Record this on the special form or POMs App and send it off. You can do this as a one-off or on a regular basis – all the information you collect will be adding to a better understanding of pollinators across the country, making you a valuable Citizen Scientist. For more information visit <u>https://ukpoms.org.uk/</u>

Get spotting

Some pollinators to look out for in spring:

Bumblebees can be very early to emerge as they are adapted to cooler weather. Look out for queens of Buff-tailed bumblebee, Early bumblebee and Tree bumblebee, that can be seen flying low in overgrown or shady, sheltered places, looking for new nesting sites.

Solitary Bees: The males of the Hairy-footed flower bee are often the first solitary bees to emerge in spring, followed by females two weeks later. Look out for these furry bees, resembling small bumblebees but with more energetic, buzzing flight between flowers. Watch also for mining bees that dig small holes in bare ground, creating a pile of earth as they dig. Many of the mining bees are active in the spring and feed on spring fruit and hedgerow blossoms. Look for the Tawny mining-bee and the Early mining bee (also called the Orange-tailed mining bee).

Spring butterflies and moths: Orange tip butterfly which lays its eggs on spring flowers include lady's smock and hedge garlic; the Brimstone butterfly and Brimstone moth, which share the same name because they are both brimstone-yellow in colour; and the delicate Mint moth, which lays its eggs on mints and similar plants.





Plant for Pollinators

An early and plentiful supply of nectar will attract hungry pollinating insects, as they emerge in spring. Plan to have some of these in your garden for spring:

- * Crocuses and Grape hyacinths— plant bulbs in autumn into pots, planters or into the ground for a beautiful spring display
- * Comfrey is a long-lived and vigorous plant that can be planted from a cutting. Its roots need the winter to establish so plant in the autumn. Many bees and other insects will flock to its flowers in spring.
- * Winter heathers planted in pots or the ground, winter heather provide flowers into the early spring
- * Primroses and cowslips these wildflowers look beautiful in a garden or in a pot.
- * Apple and Cherry if there is space, the spring blossom of these fruit trees are important nectar sources for many solitary bees and the insects are vital for fruit to develop.

Watch the weeds!

Protect Dandelions, Ground-ivy and Dead-nettles from the chop and let these precious wildflowers bloom in lawns or edges because they are some of the best early food sources for pollinators.

Join in No Mow May

Don't mow your lawn for the whole of May and watch the wildflowers spring up. Wildflowers, such as dandelions, daisies and buttercups, are important nectar resources for pollinators, fuelling their flight throughout the day.

Create a wildflower border or mini-meadows

Now is a good time to sow annual pollinator/bee mixes or wildflower mixes – it doesn't need to be a large area and you can even create your own mini meadow in a pot or planter. Scatter the seeds onto bare soil loosely, patting them or treading them in very carefully. Don't cover them with a top layer of soil. Water them in and keep them watered if the weather is dry.

Get Buzzy

Make some pollinator friendly seed paper and give them to family and friends to plant. It's very easy to make seed paper – see the resource sheet provided.

Research and draw out the butterfly lifecycle. How creative can you get? Instead of drawing the lifecycle, could you make models using clay or Playdoh, do some junk modelling or use natural materials you find outside.

Make a butterfly suncatcher. Draw out a butterfly and then cut out the inside of the wings so you just have the butterfly outline and body. Glue pieces of tissue paper to your butterfly outline so that you can see the tissue paper across the wings. Neaten up the edges and stick to a window. When the sun shines through the window, the colours of the tissue paper will shine into your room.

Make a pollinator themed birthday card. Fold a piece of card in half and decorate with your own pictures of pollinators and flowers. You could add in some puns as well, such as "Ha-bee Birthday" or "Hope you have a bee-utiful day". Can you think of other pollinator puns to decorate your cards with?





Suggested activities for June to August

This is the busiest time of year for insect pollinators. In gardens, parks, woodlands and the countryside, where there are plenty of flowering plants, there should be busy pollinators to be found. Feeding is the main activity – bees and wasps collecting food for offspring, adult insects foraging nectar and caterpillars and larvae eating their preferred food plants. Summer is also the main time for mating – so look out for `coupling' insects, resting on flowers and plants, or adult butterflies acrobatically flying in twos or threes.

Pollinator Diary

Summer is the prime time for pollinators, so keep going with your diary of what pollinators you've seen. You could also include what behaviours you're seeing. And if you're taking part in the Citizen Science activity, keep submitting your 10 minutes observations to the UK Pollinator Monitoring Scheme (see spring for more detail on this activity).

Get spotting

Some pollinators to look out for in summer:

- Bumblebees will be at their most active, with worker bumblebees collecting pollen for the offspring in the nest. Look out for Garden, Red-tailed and Common carder bumblebees.
- Solitary Bees.Look out for plants with neat holes in their leaves the sign of leaf-mining bees. If you have a bee hotel, watch for mason or leafcutter bees coming and going, and using leaves, mud and resin to seal the tubes. Look for Willoughby's Leafcutter bee and Red mason bee.
- Summer butterflies and moths. Many different adults will be on the wing, and you may be lucky to find caterpillars on their favourite food plants. Look for Peacock, Comma and Gatekeeper butterflies around large clumps of stinging nettle, their caterpillars favourite foodplant, and the brightly coloured Cinnabar, Burnet and Elephant hawk moths.

Can you complete the summer spotter challenge?

Using our spotters' guides, can you identify five different butterflies, moths or bee species. And for a further challenge how about finding five pollinators you maybe didn't know were pollinators or finding five wildflowers than pollinators love? If you want to be a super-spotter, you can complete all the spotting challenges!

Take part in the Big Butterfly Count

Every year Butterfly Conservation runs a butterfly recording event during the summer. See their website for details of the exact dates for the year and helpful resources and recording sheets to help you take part <u>https://butterfly-conservation.org/</u>







Plant for Pollinators

As feeding is the main activity for pollinators in the summer months, make sure you're helping by following these top tips to provide perfect pollinator feeding grounds:

- Try to provide as many different shaped flowers as possible. Simple, open flowers such as lavender, thistles and knapweeds are easier for smaller pollinators with shorter tongues. Flowers with long, deeper tube-shape flowers like mints, marjoram, foxglove and clovers are preferred by bumblebees with longer tongues such as the Garden bumbles and Common carder bees.
- If you have space, plant in blocks or swathes, to help the insects save energy whilst they fly between plants feeding.
- Plant a range of flower colours. Some butterflies and bumblebees prefer blue or purple flowers, whilst many hoverflies, beetles and solitary bees are attracted to yellow and white flowers.

For help on what plants to have in your garden in the summer, see <u>https://www.wildlifetrusts.org/actions/plant-flowers-bees-and-</u> pollinators

Maintain your wildflower border/mini meadow

If you have an area of grass or wildflower border leave it to do its own thing. Let the grass continue to grow long and count how many flowering plants you can find.

Get Buzzy

Build a watering station. Follow the instructions on our resource sheet to keep pollinators cool on a hot summer's day.

Buzz with a bee. Watch as it buzzes between flowers, shrubs and trees – can you draw a map of its activities and what colour plants it visited?

Play the pollen game and understand how hard pollinators work! Place a bowl at one end of the room and another bowl at the other end of the room. Put smarties (or similar sweets) in one bowl and using a straw, pick up a smartie from one bowl and transfer it to the other bowl.

Make a paper beetle hand puppet. Cut out and decorate a beetle that is just bigger than hand. Don't forget to stick on wing cases and legs for your beetle. Then attach a strap underneath so you wear it on your hand. You can then act out how a beetle pollinates, flying from flower to flower transferring pollen between the flowers.

Build a moth light trap. If you are struggling to find moths during the day, try looking for them at dusk and night. It's easy to do as moths are attracted to light at these times. Follow the instructions from the Wildlife Trust on how to make a Light Trap and watch moths appear in your garden:

http://628202242a032dff9975-

<u>8a88a36bd5b80e36c3634e14eb705770.r12.cf1.rackcdn.com/Moth%20trap%20(light%20trap).pdf</u>







Suggested activities for October to November

Although the numbers of insects may be reducing, if the autumn is mild and sunny, pollinators will continue to be active. Some insect pollinators are most active at this time in the year continuing to feed or provision their eggs before the winter.

Pollinator Diary

Continue to keep an eye out – are there any pollinators still around? Which pollinators did you most enjoy seeing this year? Can you draw your favourites? If you're taking part in our Citizen Science activity, keep submitting your 10 minutes observations to the UK Pollinator Monitoring Scheme (see spring for more detail on this activity).

Get spotting

Some pollinators to look out for in autumn:

- Bumblebees: If you're lucky, you might see groups of quiet bumblebees clustered together feeding on flowers. These will probably be male bumblebees. Once they have left the nest, males don't return, and spend their final days feeding before dying off before winter. Look out for Red-tailed and Buff-tailed bumblebees.
- Solitary Bees: The Common furrow bee, seen in countryside and towns, this is one of last solitary bees on the wing. But autumn is
 the season of the Ivy bee generally the last solitary bee to emerge. Look for stands of flowering Ivy in the autumn sun, and you
 may be lucky enough to sees great numbers of the Ivy bee feeding on pollen and nectar.
- Moths and butterflies: As their names suggest, the Autumn and November moths only appear in autumn and are both woodland species. The Herald moth is the colour of autumn with striking orange and brown wings, while the Angle Shades moth looks like a curled-up autumn leaf, camouflaged whilst resting on fences and vegetation during the day. Many adult butterflies may persist into autumn such as Speckled Wood and Wall, and the Holly blue has a second brood which feed on Ivy flowers in autumn.

Plant for Pollinators

Plan to have some of these in your garden for autumn to help the pollinators that remain:

- Flowering Ivy will be a host to many pollinating insects including bees, hoverflies, moths and beetles.
- * Mahonia and other late flowering garden plants such as sunflower also provide much needed food and autumn shelter.
- * Wild heathers can continue flowering late into autumn, a vital nectar and pollen source.

Get ready for spring and summer

Autumn is the best time to prepare for the coming spring and summer.Bulbs can be planted in pots, planters and the ground to create drifts of colour of spring pollinating plants, including snowdrops, crocuses, grape hyacinths, wild garlic and common bluebells.







Autumn is also the best season for sowing wildflower mixes into grasslands. Rake or scarify the soil, to create bare earth. Scatter the seed evenly across the sowing area, and firm it in carefully, not covering the seed with too much soil. Yellow rattle, named the 'Meadow maker', is an important pollinator forage plant of grasslands because it grows on the roots of grasses helping to stop them smothering smaller flowering plants. It is best to sow in autumn as it needs the colder temperatures of winter to germinate the seeds.

Maintain your wildflower border/mini meadow

Cut back lawns and grassland where they have been left to grow through the summer. Once cut, remove the grass cuttings and make a grass pile habitat away from your border/meadow for overwintering insects and other animals. Removing the cuttings allows light to reach the ground and prevents the build-up of nutrients in the soil.

Get Buzzy

Help provide a home for a pollinator by building bee hotel, a bug-in-a-mug hotel, a beetle bank or a log pile.

There are plenty of instructions and pictures on the internet to inspire and help you create your pollinator homes.

Here is a link to a Wildlife Trust webpage on building an insect hotel <u>https://www.wildlifewatch.org.uk/make-insect-hotel</u>.

Don't stop here though, let your imagination run wild and build the best home you can think of. If you have the space in your garden, what about building a pollinator palace, with rooms to suit all pollinators needs.

Make bee biscuits. Using Oreo (or similar) biscuits, decorate with yellow and black fondant icing and use giant chocolate buttons for wings; use icing to attach decorations. Try different colour fondant icing to represent the different bee species we have in Kent.

Make a pollinator. Use your creativity to create one of the pollinators you have been learning about using paper plates, toilet rolls and crafting supplies. You could paint black and yellow stripes on a toilet roll to make a bee or fold a paper plate in half and decorate each side the same to make a butterfly. Can you think of any other pollinators you could create?

Fingerprint caterpillar. Using your fingers and some paints, create a caterpillar fingerprint work of art. How many fingerprints can you fit on your piece of paper? Will you have the longest caterpillar?







Suggested activities for December to February

How do pollinating insects survive over winter? There are many different strategies for surviving the long, cold and dark winter days. For bumblebees, queens are the only individuals to survive over winter, hibernating in shallow holes and sheltered, underground spaces. Solitary bees overwinter as larvae or pupae, in cells or nests created by adults earlier in the year. Butterflies and moths are very diverse, and so are their overwintering habits – as eggs, larvae, pupae or adults, depending on the species.

Pollinator Diary

Get to know your pollinators – whilst its quiet and chilly outside, it's the perfect time to learn about what pollinators are and brush up on your identification skills. What pollinators do you hope to see next year? What might you do to help pollinators into your garden or local community space?

If you're taking part in our Citizen Science activity, keep submitting your 10 minutes observations to the UK Pollinator Monitoring Scheme (see Spring for more detail on this activity).

Although winter is generally thought to be a quiet season for insects on the wing, there are surprisingly still a number of species to look out for:

Buff-tailed bumblebee queens are quite commonly seen in flight on mild winter days.

- The Winter and December moths are seen in flight in the winter months, as their name suggests.
- Adult Peacocks, Small tortoiseshell and Comma butterflies may be seen, especially in buildings, disturbed by the warmth from hibernation.

Plant for Pollinators

Plan to have some of these in your garden in the winter to provide much needed pollen and nectar in the cold, winter days:

- Winter flowering heathers
- Hellebores
- Mahonias







Plant trees and shrubs

Winter is the best time for planting trees and shrubs to provide flowers for pollen and nectar in years to come. If you have space for a hedgerow or trees, plant willows, hawthorn, blackthorn and fruit trees such as apple and cherry, which all provide important spring blossoms.

Plant a mini pollinator reserve

Now is a great time to establish your own mini nature reserve for pollinators. Then by spring, all your plants will be established and perfect for pollinators to feed and shelter in. Start with a window box sized container and fill with compost & soil, topped with logs, pebbles and plants. Can you think of anything else that would benefit pollinators? Check out this webpage from Kent Wildlife Trust for more ideas on how to fill your mini reserve and other projects you can do in your garden to make it wildlife friendly <u>https://www.kentwildlifetrust.org.uk/wildathome</u>

Get Buzzy

Make a pollinator pledge

What three things might you do next year to help pollinators? Will you plant more pollinator friendly flowers? What about leaving a wild patch in your garden for pollinators to hide in over winder? Or maybe pledge to take part in No Mow May? At the end of the year, look back at your pledges and see if you achieved them all. Use our Plan Bee Pollinator Pledge sheet to record what you'll be doing.

Make a pom-pom bee

You can make this as easy or difficult as you like. Glue some yellow and black poms-poms together, and add pipe cleaner legs and antenna, paper wings and googly eyes. Or make your own pom-poms by wrapping yellow and black wool around a pom-pom maker. Once you've finished your bee, why not add some string to it and use it as a decoration.

Make a pollinator themed Christmas tree

Decorate a Christmas tree in your house with pollinator decorations (you could use your pom-pom bees or the paper plate/toilet roll pollinators you have already made). Or use gold and black tinsel to decorate your Christmas tree as a bumblebee. How creative can you be with your pollinator inspired Christmas Tree?

Get advocating

Can you write some convincing text that explains to an adult why pollinators are important and why we all need to take action.Can you use this to get someone you know to do their bit for pollinators and also make a pollinator pledge?





POLLINATOR CHALLENGE



#KentsPlanBee







Use this space to draw a picture or stick a photo of the pollinator you saw
Location:
Describe It:
Where did I see it?:
How did it make me feel?:





BEE SPOTTERS SHEET

Buff-tailed 🗹 Bumblebee	Early Bumblebee 🛛 🗹	Leafcutter Bee	Mason Bee
Sea Aster Bee	Shrill Carder Bee 🛛 🗹	Tree Bumblebee	Wool Carder Bee 🛛 🗹





NT'S PLAN BEE A E

BUTTERFLY SPOTTERS SHEET







MOTH SPOTTERS SHEET

Burnished Brass	Cinnabar 🗹	Elephant Hawkmoth 🗹	Jersey Tiger 🛛 🗹
Large Yellow 🗹 Underwing	Poplar Hawkmoth 🗹	Ruby Tiger 🗹	Six Spot Burnet 🛛 🗹





NT'S PLAN BEE

OTHER POLLINATORS SPOTTERS SHEET





MAKE YOUR OWN BEE SEED PAPER

Have a go at making your own seed paper. You can then plant it in your garden, or gift it to a family member or friend so they can also grow some pollinator-friendly flowers.

You will need: •

- PVA glue
- 2 ply kitchen roll (kitchen roll made of 2 pieces of paper) A packet of bee-friendly seeds





Carefully peel apart the kitchen roll (or if you have single ply, cut out another bee).



glue around the edges only. Allow 24 hours to dry.

Bee template for Step 1

For a Pollinator Friendly Garden of England







WATERING STATION

When it's warm, bees and butterflies may want a drink of water to keep them hydrated. By having a watering station in your garden, you can provide a welcoming drink for pollinators.

		<image/>
You will need:	Step 1	The pebbles provide somewhere
 Pebbles, rocks or glass beads 	Place the pebbles in the contain- er.	for the pollinators to sit whilst drinking so that they do not get
 A container for the water (we used a flower pot saucer in this example but you can use any shallow container) 	Step 2 Fill the container with water, but only to two thirds of the way up the pebbles.	too wet. Note—if using glass beads, make sure you locate your watering station in the shade. Otherwise, the beads will heat up & evaporate off the water.



Wildflower Reference Sheet





Bird's-foot Trefoil



Cow Parsley



Knapweed



Red Dead-nettle



Bittercress



Daisy



Nettles



Selfheal



Buttercup



Dandelion



Рорру



Shepherd's Purse



Chickweed



Ground Ivy



Primrose



Speedwell



Clover



Herb Robert



Pyramidal Orchid



Violets



POLLINATOR PLEDGE – What 3 things will you do next

year to help pollinators?

Pledge 1:

Pledge 2:



Need some examples to get you going?

- Plant more pollinator friendly flowers
- Leave a wild patch in your garden full of leaves and twigs
- Sign up to No Mow May this coming year
- Make a bee hotel
- Survey for pollinators in your garden or local park





POLLINATOR CHALLENGE 2022 IS PART OF THE

KENT'S PLAN BEE KENT COUNCIL'S POLLINATOR ACTION PLAN





JULY 2021



#KentsPlanBee



