



Pollinator Count: Guidance for educators

Bees and flies humming in the air, butterflies gracefully fluttering by and beetles soaring and landing heavily on leaves. The abundance of insects in your outdoor spaces are a clear indicator of the health of your habitats.

Insects come in the most incredible array of colours, patterns, shapes and sizes, and have fascinating and bizarre lifestyles. There is no end to the stories you can share with young people about what the insects at your setting are getting up to. One of their most important activities is pollinating the flowers.

The Pollinator Count has been specifically designed for young people, with no need for prior insect or plant identification experience. We don't expect their identifications to be perfect (the study is designed to account for some error), so please make use of the training and support resources and get counting!

Digital or paper-based?

There are two ways to take part in the Pollinator Count:

- a) The quickest and easiest option is using mobile devices to access the Pollinator Count survey. This provides step-by-step instructions and collects the data as you go. At the end, your Count data are submitted directly to the Nature Park and will be added to the map
- b) If you don't have access to mobile devices with internet connectivity, you can print the Pollinator Count survey form and upload your Count data on a computer later.

Most of this guide is applicable to both scenarios, but there's a section providing specific guidance if you're doing the paper-based version.



Green Skills



This Guidance is for Key
Stages 2-5

Location

Outdoors

Season

1 April to 30 September

Teaching time

60minutes

This guidance includes:

- Digital or paper-based?
- How to structure the session
- Choosing your survey sites
- How to make a quadrat
- Tips for weather observations
- Tips for identifying insects
- Tips for identifying flowers
- Sharing your findings with our science team
- Adaptations for the paper-based version



How to structure the session

Depending on how many young people, mobile devices and patches of flowers you have, and how much time you have available, here are three suggestions for how you could structure the Pollinator Count survey session.

1. 1. Young people lead the whole process and complete all steps themselves...

Here the young people will examine your settings' habitat map, pick which habitats and locations they would like to survey, organise themselves and the materials, collect all the scientific information including insect counts, plant identification and weather data themselves. If they are using the printed Pollinator Count survey form, they will also head back into the classroom to access computers to submit their data.

2. 2. Young people take on different roles...

You can organise the young people into different 'specialist' roles, so they all get to contribute to the scientific process. You can choose to assign roles based on the strengths of the young people in your group, or the skills you'd like them to develop. This approach is useful to recognise different skills in your group, but can also help if you have fewer mobile devices or fewer patches of flowers to study.

Roles include:

Insect identifiers (entomologists)

These young people will record the habitat, date and time information and then identify and count the insects landing on flowers in the quadrats. They will record this information on the digital or printed Pollinator Count survey, and input the plant and weather data provided to them by the other roles.

Plant identifiers (botanists)

These young people will visit each quadrat with a mobile device or identification guide, and photograph and identify the 'chosen flower' and flower head type for each group. They will conduct the flower coverage estimates, count the number of flowers and assess the presence of any other plants.

Weather monitors (meteorologists)

During the session, these young people will assess the wind, cloud cover and temperature (using the internet or a thermometer). It is best if they make this assessment whilst the insect identifiers are carrying out their insect counts. The weather surveyors will then need to visit each quadrat to assess the shade coverage of the quadrats. When taking this approach, please remember there should be a maximum of three people at each quadrat during the insect count, so that the insect behaviour is not disturbed. The plant identifiers and weather monitors will therefore need to carry out their quadrat surveys before or after the insect count.

3. 3. You complete some of the tasks yourself beforehand...

If time or mobile devices are limited, or you feel some of the tasks would be too challenging for your learners, you can carry out some of the tasks yourself, beforehand. These include:

- Deciding which habitats to survey.
- Deciding where the quadrats will be placed across the habitat.
- Identifying and photographing the flowers.

Remember to number the quadrats/groups and record where these are on a map, to ensure the flower and habitat data are matched with the right Pollinator Count.



Choosing your survey sites

Discuss with your group where you'd like to do the survey. You could revisit your Nature Park habitat map (if you've done the Mapping your Site activities already) to decide which habitats to focus on.

The survey sites need to have plants that are in flower – ideally multiple patches so your group can spread out. A maximum of three young people should be watching each quadrat. You may wish to:

- A) Put all the quadrats in one habitat.
- B) Compare different habitats.
- C) Compare an area where you've made a habitat improvement to one that you haven't changed.
- D) Survey an area which has plans for enhancement, so they can compare changes in the future

The young people will need to make a note of the habitat type (e.g. grasses and wildflowers, trees, vegetables and flower gardens) they are doing the survey in, as they will need to record this.

How to make a quadrat

A quadrat is a square frame you can lay over plants to identify a survey area for scientific study. Quadrats can be bought online but are also easy and cheap to make. This survey uses a 50cm x 50cm quadrat.

You can use any material that can be arranged in straight lines, but the best materials to use are bamboo canes or pieces of string.

Cut 4 x 60cm lengths of bamboo, lay out in a square so there is a 5cm overlap at each corner, and secure with tape or string.

If using string for your quadrat, you can simply cut a 2m length of string and tie knots at 50cm intervals, to mark the corners. Arrange into a square over the plants.



Quadrats can be placed flat on the ground, over a flowering plant, or vertically against a flowering climbing plant.

Tips for weather observations

Weather conditions can affect the behaviour of insects and, therefore, how many insects the young people might see. Recording this information helps us understand the potential impact of weather on the data. One question asks the temperature – you can use a weather app or website (such as www.metoffice.gov.uk) or thermometer to measure this.

Tips for identifying insects

Try not to pitch this activity as a challenge to count the most insects, or a competition between the different groups, as this may encourage the young people to over-estimate their counts. Instead, focus their attention on the excitement of anticipating whether an insect will land on their chosen flower. Emphasise that this is real science research, that their data will be studied by Dr Victoria Burton at the Natural History Museum and other science researchers, and so truthful observation is important. Recording no insects, or very few, is just as important research data as finding lots of pollinators, as it shows you where there is opportunity to enhance your site.

The young people need to sit on the side of their quadrat where they won't cast a shadow over it, and they need to sit quietly and relatively still, so the insects feel safe to visit the flowers.

Young people only need to identify eight groups of insects, plus there's an extra category for ones smaller than 3mm and an 'Other' category for any they are unsure of, or that don't fit in the other groups. An identification guide is provided to help them – the trick is to largely ignore colour (as many flies mimic the colours of bees and wasps) and rather focus on the length of the antennae, how narrow the waist is, and the size of the eyes.



Don't rely on colour to identify insects. The fly (left) has large eyes, filling a lot of the head, and very short antennae. The bee (on the right) has longer thicker antennae and a narrow waist.

- ✓ Only insects that land on the 'chosen flowers' should be counted.
- ✗ Insects that fly through the quadrat don't count.
- ✗ Insects that land on other types of flower don't count.

The young people can record a tally for what they saw on printed versions of the Pollinator Count insect recording sheet (if using mobile devices), or the printed Pollinator Count survey form.

They should only record a tally if they are DEFINITE about the type of insect it was. For any insects they are not sure about, or moved too fast, they can record them in the 'Other insects' group.

Tips for identifying insects (continued)

When the time is up the young people will total up the counts for each insect group, and if using mobile devices enter the numbers into the digital survey.

Checking the accuracy of your identifications













We know that insect identification will be new to many young people, and we don't expect them to be perfect. To help us understand their accuracy levels and account for that in our analysis, we have included an Insect Identification Challenge to complete after the Pollinator Count is done.











On a mobile device, the Insect Identification Challenge is included at the end of the Pollinator Count survey. Young people will be asked to spend some time looking for insects similar to the ones they recorded during the count. They will need to take photographs of these insects and identify them to the same broad groups. The photos need to be close up, include the entire insect in them, and be in focus. How long they spend looking is at your discretion, based on how much time you have available. If you're doing the paper-based version, they will need to identify the insect groups in the eight photos provided on the form.

For both insect identification challenges, it is important that the young people answer these questions without an adult, just like during term assessments. Understanding where people commonly make mistakes allows us to improve our resources, and also enables us to report the accuracy of the data in the scientific research published from the dataset and to account for any possible errors in the data analysis.

Insect Identification Quiz

Before you finish, tell us which group you think each of these 6 insects belong to. (Pick from the 10 insect groups in the table below)

		
Insect 1 	Insect 2 	Insect 3 
		
Insect 4 	Insect 5 	Insect 6 

Bumblebees	Honeybees	Solitary Bees	Wasps	Hoverflies
				
Other flies	Butterflies and moths	Beetles	Small insects	Other insects
				

Tips for identifying flowers

The young people can choose any flowers, wild or planted, in any part of your site.

A quadrat (a 50cm by 50cm square) is laid over the flowers, either on the ground or placed vertically on a flowering bush or climbing plant. See instructions below for how to make your own.

Each quadrat should be observed by a maximum of three young people – any more and their presence may affect how many pollinators visit, as they may unintentionally block the flightpaths and the sunlight.

In each quadrat the young people will choose one type of flower to watch (called the ‘chosen flower’). It can be a different type of flower in each quadrat, or the same type.

The Pollinator Count survey will prompt them to take a photograph of the whole quadrat, one of the flower and one of its leaves. The photos need to be close up, include the entire flower or leaf in them, and be in focus. Putting your hand, or a sheet of paper, behind the plant helps it to stand out from the background.

If you’re doing the paper-based version, take these photos on a digital camera.

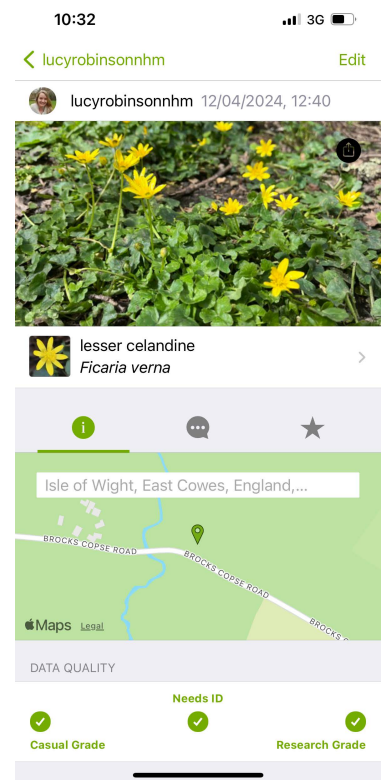
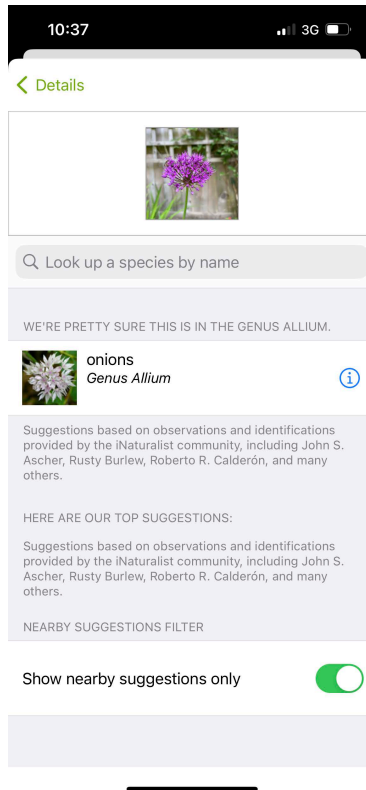


How to identify the chosen flowers

Some flowers attract pollinators more than others, so we ask you to identify the flower you were observing. We know plant identification isn't always easy – just do your best (we don't need exact species or variety, unless you happen to know it). A common name e.g. Rose or Daisy is fine, but a scientific name is even better.

For wild flowers: iNaturalist UK app or website or Seek by iNaturalist. <https://uk.inaturalist.org/> have built-in image recognition, so when you upload a photo to the app or website, it suggests the name of the plant and may give you several suggestions to choose between.

For planted flowers: RHS Identify Your Plant website. www.rhs.org.uk/my-account/identify-plants (you need to create an account to use this). This also has built in image recognition, so when you upload a photo to the website, it suggests the name of the plant, and may give you several suggestions to choose between.



Encourage the children to deliberate about the difference between what they can see on their 'chosen flowers' and the suggestions made by the app, and then make their best decision. The photos they submit of their chosen flowers allow the Nature Park Community Science team to double check the identifications.

Alternatively, you can use a plant identification guide. The Field Studies Council make very low-cost guides such as 'Playing field plants' (£4) or there are numerous books available. You will also be asked to count how many flower heads of the chosen flower are within the quadrat. Flower heads look different on different groups of plants, so we ask young people to say which flower shape is closest to their chosen flower. Each of these four options counts as one flower.



Sharing your findings with our science team



Sending in your observations is so important, so you can track your progress over time towards boosting biodiversity at your site, and also allow researcher Dr Victoria Burton (left) to study pollinators nationally across the Nature Park.

The study is designed to account for error amongst young people's observations, so please don't be put off from submitting data because you're concerned about accuracy – we've got it covered!

Using the digital form will automatically submit your results if you are online. If you use the paper forms, please ensure you enter them at a computer during or straight after the session. You can view the results on the Nature Park website.

Adaptations for the paper-based version

If you are not able to use the digital Pollinator Count survey, print a copy of your habitat map (using the Mapping Change tool - the print button is at the bottom of the 'Explore' screen) and take it outside with you, so you can record where each of the quadrats was conducted.

Give each quadrat a number, and ask young people to record it on their printed forms. The camera you provide them with can also be labelled with this quadrat number, to help you match them up the plant photos with the Pollinator Counts when you enter the data online later.

At the end, they (or you) will need to use a computer to return to the Pollinator Count webpage and follow the links to enter the data into the online version of the survey form.



National Education
Nature Park and
Climate Action Awards



For more quality-assured learning resources visit
www.educationnaturepark.org.uk

Led by



Natural
History
Museum

With



THE
ROYAL
SOCIETY

Commissioned by



Partners



Working with

