

# Polli:Nation Survey

## Group Leader Support Guide



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## What is the Polli:Nation survey?

Thank you for participating in the Polli:Nation survey! The Group Leader Support Guide is intended to provide teachers and group leaders with help in preparing and running the survey. It also offers some ideas for post-survey activities. The following sections provide a list of items to be considered for each of these stages, although it is not exhaustive. Please add or customise the suggestions as you find appropriate. All the survey documents (including the Survey Booklet, Habitat Plant and Pollinator Guide and Recording Sheet) are downloadable from the Polli:Nation website:

[www.polli-nation.co.uk/activity/survey](http://www.polli-nation.co.uk/activity/survey)

## Polli:Nation Programme

Polli:Nation is a UK wide initiative that supports schools, community groups and individuals to turn their school grounds, gardens and other local spaces into pollinator friendly habitats. The aim of the project is to engage and enthuse children and young people about protecting pollinating insect species in the UK. The outcome of the project is to see an increase in the number and diversity of pollinating insect species in school grounds and local community spaces across the UK. The project has been designed to be cross-curricular and is suitable for secondary and primary schools. It provides pupils with hands-on experiences; from surveying, to creating night-blooming flower beds; to lobbying for change to school maintenance regimes and debating pesticide use. Pupils will learn about the role pollinating insects play in ecosystem services and be able to contextualise this in the choices and actions they take.

## Polli:Nation survey

The Polli:Nation survey was created by the Open Air Laboratories Network (OPAL) for Polli:Nation. Polli:Nation is encouraging everyone to become a citizen scientist by surveying their local patch (school grounds, park or garden) for pollinators, to make habitat improvements for pollinators on their patch, and finally to find out what effect habitat improvements have had on their patch by re-surveying.

# Aims, objectives and curriculum links

## Aims

The Polli:Nation survey is a large-scale national survey intended to provide new and useful information on the:

- Health of the UK's pollinator friendly habitat in the UK using the abundance of pollinators as an indicator.
- Distribution of pollinating insects with respect to habitat type, plants and flowers nearby, and wider site characteristics.
- Impact of habitat change on the abundance and diversity of pollinating insect species.

## Learning objectives

By taking part in the Polli:Nation survey, participants will

- Learn about pollinators and their importance to enable plants to make seeds and reproduce
- Learn about habitats and their importance for pollinators
- Learn how to follow a scientific methodology for biological surveying

## Curriculum links

Although everyone can take part in the Polli:Nation survey, in particular it provides an opportunity for schools to carry out a scientific survey where the outcome is not known (it is not a 'fair test' style of science practical). It also allows pupils to carry out a safe, manageable and low-cost fieldwork activity within timetabled lesson time in science and an opportunity to be part of a groundbreaking national survey that makes a real contribution to our wider knowledge. The survey is designed to be repeated throughout the spring, summer and early autumn as different pollinators emerge providing schools with their own 'big data' sets that can run over many years and be comparable to other schools or locations. There are also a number of practical educational activities about Pollination available on the Polli:Nation website:

- Suitable for 3-14 years: [www.polli-nation.co.uk/activity/buglife-b-lines-education-pack](http://www.polli-nation.co.uk/activity/buglife-b-lines-education-pack)
- Suitable for 5-7 years: [www.polli-nation.co.uk/activity/pollination-demonstration](http://www.polli-nation.co.uk/activity/pollination-demonstration)
- Suitable for 7-14 years: [www.polli-nation.co.uk/activity/the-big-pollination-activity](http://www.polli-nation.co.uk/activity/the-big-pollination-activity)

Pollination can be a focus for teaching many aspects of the curriculum. For more detailed exploration of the opportunities that pollinators, their spaces and looking after them provide, see [www.polli-nation.co.uk/activity/UKcurriculumlinks](http://www.polli-nation.co.uk/activity/UKcurriculumlinks)

## Primary age

**England.** Y3: Plant life cycle and pollination; animals need the right types of nutrition. Y4: Predator-prey relationships; food chains; classification groups and keys; a change in the environment can pose dangers to living things; water cycle. Y5: life cycles; reproduction in plants. Y6: Classification; pollination; water and nutrient transportation in animals and plants; adaptation and reproduction; evolution.

**Northern Ireland.** Primary curriculum links to 'The World Around Us'

**Scotland.** Curriculum for Excellence. Sciences> Planet Earth>Biodiversity and Interdependence: Second level SCN 2-01a/SCN 2-02a/SCN 2-02b. Numeracy and Mathematics>Information Handling: Data and Analysis: Second level MTH 2-21a.

**Wales.** The Polli:Nation survey links to "how science works" and has clear links to the Literacy and numeracy framework.

## 11 to 14 year olds

The survey fits with National Curriculum KS3 Science SC1 2d; SC2 5a, 5b. The survey also links closely with QCA Units such as: 7c Environment and feeding relationships, 8d Ecological relationships, and 9m Investigating scientific questions. Scottish Curriculum for Excellence: Sciences Third level SCN 3-01a; Numeracy and Mathematics Third level MTH 3-21a.

## 14-16 year olds

As well as an opportunity for independent research, the survey helps deliver aspects of GCSE Science and Biology:

- AQA Science (A&B) and Biology A. To analyse and interpret scientific data concerning environmental issues
- Edexcel Additional Science. B2.4 (Interdependence): 3. Investigate, using primary and secondary data, the impact of human activity on the environment.
- OCR Science B (Gateway Science). B2a (Ecology in our school grounds): B2h (Sustainability), B2b (Grouping organisms)

The survey enables development of enquiry skills, such as practical skills; working collaboratively; communication of results: orally, in writing and using ICT; scientific thinking: explaining phenomena; critical understanding of evidence; research and study of science in a local, national (and global) context.

# Planning the survey

## Lesson planning

It should be possible to carry out the survey within a single lesson.

The minimum time you need to complete the practical survey work is approximately 45-60 minutes, plus the time needed to travel to the survey site (see page 4: *Where to carry out the Polli:Nation survey*).

After some introductory questions, there are two parts to the survey: A and B. Data for part A can be submitted without completing part B.

### Part A: Habitats

This part looks at feeding, nesting and sheltering habitats both within your survey site (a 10 metre by 10 metre area) and more broadly in your local patch. Part A can be carried out at any time of the year, though spring or summer is best.

### Part B: Pollinators

This part looks at pollinating insects visiting 3 quadrats (1 metre by 1 metre areas) within your survey site. This survey should be done between April and September when the weather is dry, sunny and warmer than 11°C.



### Extension activities

There are also a number of extension activities which build on the skills and knowledge learnt during the survey, you may choose to take part in these too although these will extend the duration of the survey beyond one hour.

## Equipment needed

The survey is best carried out by participants working in groups of three. For a class of 30 working in groups of 3 you will need:

- a Survey Booklet
- a Group Leader Support Guide
- 10 Habitat, Plant and Pollinator Identification Guides
- 10 recording sheets

These documents are available to download for free at: [www.polli-nation.co.uk/activity/survey](http://www.polli-nation.co.uk/activity/survey)

In addition we recommend bringing:

For group leaders:

- a mobile phone
- a camera
- a First Aid kit
- a map
- a 1 metre length of string (alternative to tape measure)

For participants:

- ten thermometers
- ten 10 metre tape measures
- ten 1x1m quadrats (see website to make)
- ten stopwatches
- ten clipboards and colouring pencils

## Scheme of work

You may wish to split surveying across several lessons.

### Lesson 1: Introduction

- Which of our foods require pollinators? [Establishes why this topic might be important to your students]
- What organisms are Pollinators? [introduction to identification skills]
- What kind of habitat do they require [Informs participants of the importance of this research]
- Surveying for Pollinators
  - Recap habitat requirements
  - Introduce key words for valid ecological surveying [Representative, Reliable, Unbiased]
- Completion of Part A of survey

### Lesson 2: Identifying pollinators

- Research the distinct features of our 6 pollinators groups
- Familiarisation with 12 Quest Species
- Completion of Part B of survey
- Data submission

*Short on time?* You could split Parts A and B between groups so that one group records habitat features and plants and the other group records pollinators visiting the quadrat.

## Health and safety

We want people to get outside and discover their natural environment, and experience the benefits which come from this. Polli:Nation's approach to risk and the methodology we use are evidence based and in line with official UK Government Policy, European Play and Education Policy. We follow best practice guidance from the Health and Safety Executive, Royal Society for Prevention of Accidents, The Play Safety Forum and our own experience and understanding. We would advise that all group leaders carry out a Risk Benefit Analysis.

Further guidance can be found at [www.ltl.org.uk/spaces/ltlriskbenefit.php](http://www.ltl.org.uk/spaces/ltlriskbenefit.php)

Things to consider:

- Make a preliminary visit to the outdoor space and identify potential hazards in advance of any field work.
- Take a first-aid kit along with a mobile phone. A map and GPS are also useful, especially if the site you are visiting is more remote.
- Make sure everyone taking part is familiar with safety instructions and what to do in an emergency, e.g. assembly points.
- Make sure that anyone requiring medication takes this with them, especially if you are planning to spend longer outdoors.
- The survey is not suitable for children under the age of 5.
- Children of all ages and vulnerable adults must be supervised at all times. Make sure that there are sufficient adults for the number of children in the group so that all may be supervised properly.
- Make sure that people wear appropriate clothing for the weather and time of year, robust sensible foot wear with good grips on the soles, sun hat and sun cream (minimum factor 15) are recommended for the surveying season.
- Make provision for hygiene, such as baby wipes or hand sanitizer. Encourage participants to wash their hands after surveying

## Where to carry out the survey

The Polli:Nation Survey can be carried out anywhere in the UK. It is particularly suited to places you might be looking after for pollinators.

- Please ensure you have arranged access permission from the landowner before the start of the survey.
- Do not choose a survey site where you may place yourself or others in potential danger due to local hazards.
- Consider the time it will take to reach your site and if this is feasible in the time you have available.

We recommend undertaking a reconnaissance trip to check to see if the site is suitable.

## Local patch, survey site and quadrat

We want to monitor pollinators across three scales (local patch, survey site and quadrat) to monitor how they use the landscape for feeding, nesting and sheltering.

- The **local patch** is the whole area that you could survey, such as school grounds, a park or a domestic garden.

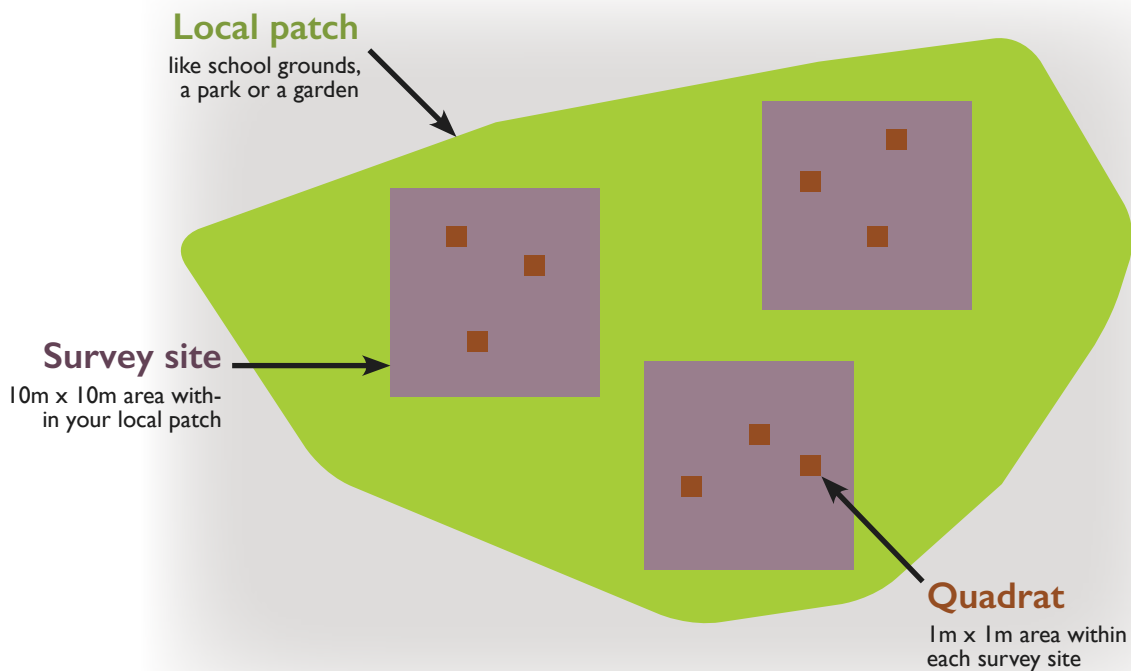
The local patch can be any shape or size. But if you can, try to choose a local patch which is at least 10 square metres in area. A good local patch to survey will contain two or more of the following broad habitats: flower beds or pots, areas of wildflowers, trees, bare ground, damp places, walls or fences, short grass, and concrete or tarmac.

- The **survey site** is any 10m x 10m area within your local patch.

It is up to you where you place the boundaries of the survey site. Try to choose a survey site which contains a representative mix of the habitat features in your local patch and plants in flower if possible. Alternatively, if your local patch is large, create multiple survey sites. You can still carry out the survey if your survey site is smaller than 10m x 10m, as long as you record the length and width.

On a practical note, participants will need to walk over the whole of the survey site, so it is best to choose a 10m x 10m area which will survive trampling. A rough grassy area at the edge of a playing field, with some variation near the edge (such as short grass, tarmac, walls, hedges or trees), is likely to be suitable.

- The **quadrat** is a 1m x 1m area within your survey site.



A quadrat can be made by fixing 4 metre rules together into a square. Take up to three quadrats per survey site. Use random numbers to place the quadrat within the survey site.

## Remembering your survey site

If you plan to survey your patch more than once, and especially if your patch will have multiple survey sites within it then we recommend that you make a record of where these sites are for your own information.

- Print off an aerial map of the patch you're looking at (park, schools grounds etc.)
- Draw on the approximate locations of the survey sites with your local patch
- Number these sites sequentially
- Match each site with the group that worked on it, we would suggest numbering or naming your groups to match
- Take a photograph of your survey site – it will help finding it in future, and records changes you have made.



# Carrying out the survey

The survey is best carried out by participants working in groups of three. One participant can record results in the survey booklet or on the recording sheet, while the other participants can take measurements.

## Introductory questions (Questions 1 to 9)

These questions gather information about the age and skill level of participants, as well as the date and location of the local patch.

If you are a registered Polli:Nation school please make sure you have your school's Unique Reference Number (URN) to hand so you can help pupils to fill in questions 6. Your School URN is a 6 digit code that was issued to you at the start of the project. Don't worry if you are not taking part through a registered Polli:Nation school; we would still love you to do the survey and report your results!

Questions 7-9 allow you to record information about any improvements for pollinators you may have made to your local patch. This will allow us to monitor the Before and After effects on pollinators. Don't worry if you leave this blank.

## Part A: Habitats (Questions 10-14)

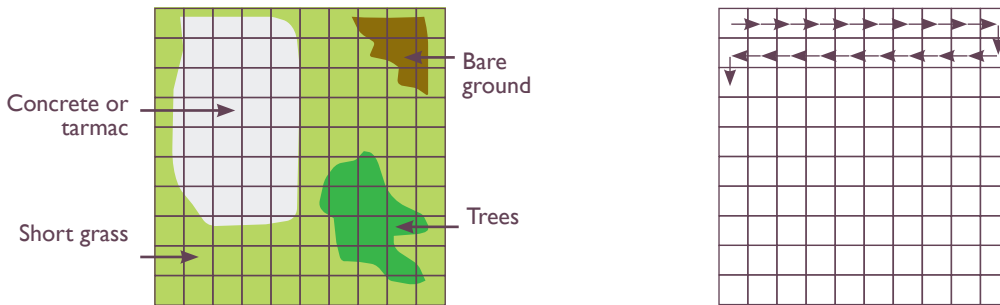
Pollinating insects need feeding, nesting and sheltering habitats to live. This part of the survey allows you to record the presence of these habitats both within your survey site and more broadly in your local patch. Use the Polli:Nation survey Booklet instructions to help you measure and map your survey site and record the habitats and plants within this site.

### Mapping your survey site (Question 12)

The 10m x 10m area has been chosen to ensure standardisation between different locations.

Participants could *either* use tape measures or a trundle wheel to measure the size of each of the 9 habitat types within the survey site. Then draw the shape of each habitat type onto the 10x10 grid (below, left)

Or one member of each participant team could systematically walk to each of the one hundred grid squares by moving 1 metre each time from left to right then right to left, until each square has been visited (below, right)



Use the drawing on the 10 x 10 grid count the number of squares covered by each habitat type. Record the number of squares covered in the table. If more than half a square is covered by a habitat type count this as one.

There are photographs and more guidance text of the nine habitat types in the Habitats, Plants and Pollinator Guide.

	Habitat type	Notes
Feeding habitat	Flower beds or pots	Includes flowers in planters or pots, raised beds and borders
	Wildflowers	Includes wildflower meadows and grassy verges
	Trees	Includes trees, orchards, shrubs, bushes and hedgerows
Nesting and shelter habitat	Bare ground	Includes bare earth and bee banks
	Man-made homes	Includes bee hives, solitary bee houses and bumblebee nests
	Damp places	Includes ponds, ditches, compost heaps and log piles
Other	Bare walls or fences	Includes brick or stone walls and wooden or metal fences
	Concrete or tarmac	Includes paths, roads, car parks and playgrounds
	Short grass	Areas where grass is mown or grazed by animals

## Plants within your survey site (Question 14)

Question 14 asks participants to record 28 plants that might be found inside their survey site (the 10m x 10m area). For each plant, they need to tick if it is present, and if so tick whether it is in flower.

There are photographs and more guidance text of the 28 plants in the Habitats, Plants and Pollinator Guide. Plants have been put into three feeding groups: woody plants, garden plants and wild plants. Within these groups, we have grouped the plants by flower colour.

## Part B: Pollinators (Questions 15-17 & Placing your quadrat parts 1-4)

In part A of the survey you mapped the different habitat types in your survey site. Part B will allow you to record how many pollinating insects visit flowers in quadrats within your survey site. This brings the scale down from a 10m x 10m survey site down to a 1m x 1m quadrat.

Before participants move onto this section, it may be worth spending some time familiarising them with the eight pollinator groups shown on the reverse side of the Habitat, Plants and Pollinator Guide (bumblebees, honeybees, solitary bees, beetles, butterflies, moths, hoverflies and other flies).

Since the number of pollinators flying on any given day is strongly related to weather conditions, questions 15-17 prompt participants to record sunshine, temperature and wind.

### Placing your quadrat (parts 1-3)

Part B involves three counts of pollinators. You can either place three different quadrats within the survey site or use the same quadrat and move it after each count. Please place the quadrat on a flowery spot (either on woody plants, garden plants or wild plants) each time. This could also be on a vertical surface, such as a hedgerow or trees, such as an ivy covered wall. Record the 'floweriness' of the quadrat as 1, 2 or 3.

Once this basic information is collected, it is time for the 2-minute pollinator count. Participants will need to sit quietly so that pollinators are not scared away. One member of the participant team uses a stopwatch to time two minutes. Another member of the participant team records how many pollinator insects enter the quadrat (either by flying or walking) and land on a flower during the two minutes. Use tally marks to count the number of pollinators in each pollinator group.

### Species Quest (part 4)

This is an optional section. If participants see any of the 12 Species Quest species at any time during the survey, they can take a photograph and submit it to the Polli:Nation website. Submitted record will be added to national distribution maps and will be valuable for years to come.

## Photographs

Participants may like to take a photograph of the site they have surveyed, or the plants and pollinators in their quadrat. Photographs can be very useful as aids to the identification of invertebrates and images can be compared with those on iSpot ([www.iSpot.org.uk](http://www.iSpot.org.uk)) or submitted there for help with identification. Capturing images of various stages of practical activities can also allow participants to illustrate their own accounts of fieldwork, for personal or practical reasons. It is assumed that any photograph sent to the OPAL website has the consent of the photographer to show the image on the OPAL website and also the consent of anyone appearing in the image for this image to be sent and used in this way.

Wherever possible, please can you take photos of the Species Quest pollinators that you spot. This is really important as your photos will allow us to submit your data to biological records centres, making your survey even more useful for scientists! Please make sure that you take a camera (or other device with a camera) out to your survey sites when you are conducting Part B of the survey (surveying pollinators).

# Completing the survey

Thank you for taking part in the Polli:Nation survey!

## Data submission

After completing the survey, results should be entered online (if possible) because this enables participants to submit an accurate geographical location for their survey site, and to upload any pictures of the Species Quest species that they would like to share. It will also allow them to instantly see their data on a UK map, alongside data from others who have taken part. They can also explore maps of species occurrence across the UK, and find out where certain habitat types are particularly abundant. To enter data go to [www.polli-nation.co.uk/activity/survey](http://www.polli-nation.co.uk/activity/survey). If any participants do not have access to the internet they can post the completed workbook to this Freepost address:

**Freepost RSCH-CKYJ-HYYC, OPAL, Centre for Environmental Policy,  
Imperial College London, London, SW7 2AZ**

If you are planning to make habitat changes or survey your site multiple times, you will require a survey site code. This will be issued to you when you enter your data online. Please make sure to note the code down (and match it to your own personal record of where your survey site or sites are), this will allow us to track the habitat changes within your survey site. It is important that you keep a record of this number as it cannot be re-issued.

## What do your results mean?

We hope you've enjoyed taking part in the survey. Your data will now be analysed by our team of scientists. By taking part you have helped to build a map of the feeding, nesting and shelter habitats available to pollinating insects in the UK. If you made changes to your school grounds, park or garden then our scientists will look at your data to find out how these changes have helped to improve the number and variety of pollinators. The more data we receive the better our understanding of pollinators and their habitats will be, so keep surveying your site to help us build a clearer picture.

## Extension activities

There are also a number of extension activities which build on the skills and knowledge learnt during the survey, you may choose to take part in these too although these will extend the duration of the survey beyond one hour. Extension Activity 1: Bee Hotel, and Extension Activity 2: Site Mapping may be of particular interest.

## Caring for pollinators – have you made a difference?

If you are looking after part of your local patch with pollinators in mind, this survey can be repeated to help you discover the difference you have made for pollinators. Carry out at least one survey before you have begun caring for the patch, and repeat it as often as you like over subsequent seasons and years. Keep a copy of your survey data each time, and you will be able to compare the differences in subsequent surveys.

Copies of the recording forms from the workbook can be photocopied and are available for download from [www.polli-nation.co.uk/activity/survey](http://www.polli-nation.co.uk/activity/survey).

