

Unit 2.6: We are zoologists

Collecting data about bugs



Software: Google Sheets, Google Docs, Google My Maps, Google Slides, Camera and Photos apps (alternatives: Microsoft Excel/Word/PowerPoint, Windows Maps, Microsoft Photos)

Hardware: iPads (alternatives: laptop/desktop/Chromebook computers and digital cameras)

Overview

In this unit, pupils go on a bug hunt, recording and identifying the small animals they find. They organise the **data** they have collected, record it on a spreadsheet and create charts; they add images to a local map. In:

- **Session 1** they are introduced to the objectives of the unit and to how a **classification key** and **branching database** can be used to classify invertebrates
- **Session 2** they use tick and tally charts to record how many invertebrates they find and they take photographs of some of the bugs they find
- **Session 3** they edit and enhance the photos they have taken and add these to a shared document together with captions identifying the bug
- **Session 4** they create a chart from the data they collected and make choices about the most appropriate chart to use to display their data
- **Session 5** they are introduced to Google Maps; they add location markers for the bugs they found to a custom layer and add further information to these markers
- **Session 6** they summarise the information they have collected in a presentation, drawing on their photographs, charts and maps.

Alternatives

The unit sessions give step-by-step guidance on using Google Apps and the iPad Photos app. Instead of Google Apps, you could use Microsoft 365 and instead of the iPad camera, you could use digital cameras and photo editing software such as Microsoft Photos.

Knowledge, skills and concepts

In this unit, pupils will learn to:

- sort and classify a group of items by answering questions
- collect **data** using tick or tally charts
- take, edit and enhance photographs
- use Google Sheets or Microsoft Excel to produce basic charts
- record information on a digital map
- summarise what they have learned in a presentation.

Progression

In Key Stage 1:

- In **Unit 1.6: We are detectives** pupils worked with data using Google Sheets.

In Key Stage 2:

- Pupils develop their skills in collecting, organising and displaying data in **Unit 3.6: We are opinion pollsters**.
- They further develop skills in collecting, analysing and presenting data in **Unit 4.6: We are meteorologists**.

Differentiation

See each session (pages 63–68) for ways to increase support and add challenge to this unit.

Assessment – by the end of the unit:

All pupils can:

- take digital photographs of bugs
- review photographs on the camera roll
- add **data** to a tally chart
- create charts to show the data they collect
- explore Google Maps to find a familiar location
- create a presentation summarising their data.

Most pupils can:

- use **classification keys** to identify a class of things from questions about their properties

- edit and enhance photos, including cropping
- import photos to a document and add captions
- add titles to charts and labels to axes
- upload information about the location of bugs
- present their research to their classmates.

Some pupils can:

- take focused, well-composed photos of bugs
- use **GPS** to identify the location of bugs
- explore options in charting software
- add photographs to points in Google My Maps.

Background information

- Pupils work with technology to collect and analyse a range of **data** and information about invertebrates living in the school grounds. They begin by creating content relating to the animals they find and they go on to organise and manipulate this content using a number of tools, storing their results as they go.
- Pupils draw on a range of their software skills acquired over the previous terms: they make use of digital photographs, they use spreadsheets to organise data into a table, they add images and captions to a shared document and they present information to an audience.
- Pupils consider the different types of data that they can work with using computers – from simple frequency counts for categories to location information and digital images.
- The digital technologies pupils use in this unit – statistical charts, digital photographs and **geolocation** data (including **GPS**) – are used by real zoologists and are examples of common uses of information technology beyond school.
- Pupils use technology safely. When sharing photographs and geolocation information online, they consider the importance of keeping personal information private and achieve this by not including names or photographs of people.

Key vocabulary

Binary: a number system that uses two numbers: 0 and 1; binary questions are questions with yes or no answers

Binary tree: a way of structuring data where each element has no, one or two child elements: a series of yes/no questions to identify an animal can be represented in this way

Branching database: software allowing a series of questions to be created to interactively identify objects

Classification key: series of questions (usually of a yes/no type) used to identify an animal or plant

Data: structured information gathered for analysis, often, but not always, as numbers

Database: a structured collection of data organised so that groups of records can be identified

Geolocation data: latitude and longitude (and sometimes altitude) or grid references, which specify the location of something, such as a digital photograph

Global Position System (GPS): this system allows a user to determine their exact location using a network of satellites

Pixels: picture element – one of the small, square dots that makes up a digital image

Tally charts: used to count data quickly; you record lines in groups of five

Cross-curricular opportunities

Science: Pupils learn to identify and name a variety of animals in their habitats. The pupils could look for evidence of other types of animals.

Maths: This unit provides opportunities to record, interpret, collate, organise and compare information.

Geography: Simple mapping, fieldwork and location skills and geographic vocabulary. Skills could be used

in a different context, such as collecting local traffic data.

English: Research and write about some of the bugs found.

Art and design: Photos of bugs could also be sketched.

Design and technology: Design or make habitats for some of the bugs found.

Preparation for teaching the unit



Things to do

- Check you have access to the Google Apps or their Microsoft 365 equivalents.
- Consider how pupils will store their photographs, ideally to a shared album. If iPads have been set up with the same Apple ID, pupils may have access to a shared camera roll.
- Read pages 60–61 to get an overview of the unit.
- Read the steps in the unit sessions (pages 63–68) and look at the associated online resources, printing out the worksheets as required.
- Watch the relevant CPD videos.
- Work through the unit yourself so you know what is expected of pupils.
- Make any arrangements necessary to use the school grounds or to go off-site for the survey.



Resources needed

- **Software:** Google Sheets, Google Docs, Google My Maps, Google Slides, Camera and Photos apps
- **Hardware:** iPads
- See *Alternatives* on page 60



Online resources provided

Session resources

- Worksheet 2.6a: Bug hunt classification key
- Worksheet 2.6b: Bug hunt plan
- Worksheet 2.6c: Recording the bugs tally chart
- Worksheet 2.6d: End-of-unit quiz
- Worksheet 2.6e: Pupil self-assessment
- Teaching slides: 2.6a–2.6f
- Walkthrough videos: 2.6a–2.6c
- Interactive end-of-unit quiz 2.6

Additional resources

- CPD video: How a digital camera works
- CPD video: How GPS works

Alternatives

- Software in 60 Seconds: Excel charts



Online safety

- Explain to pupils that photos taken on a digital device sometimes use **GPS data** to automatically add location information to the photos. Explain that this is helpful for us when adding the bug hunt photos to a map, but that it would be wise to remove this information from photos of themselves or other people, because they should keep personal information private.
- If pupils use the Picture Insect app, they should think about how similar technology might be used to identify individuals. Do they have concerns about automatic facial recognition?



Collaboration

- The planning and bug hunt is based on small groups of pupils working collaboratively to collect and organise data.
- In Session 5, the class add points and images to a shared map. In Session 6, pupils work in groups to present a summary of their work in this unit.



Useful links

Software and tools

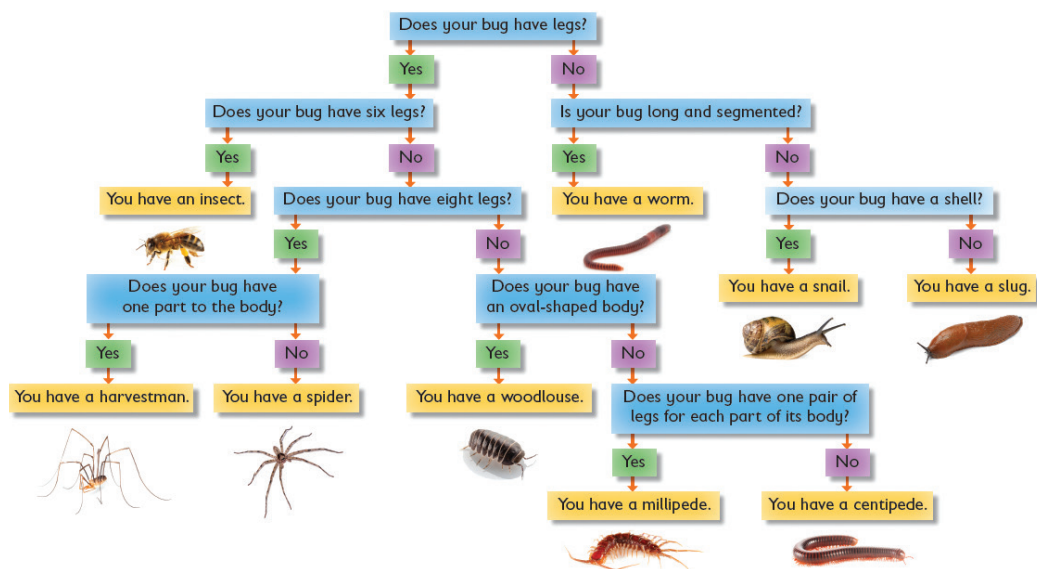
- G Suite for Education:
edu.google.com/products/gsuite-for-education
- Google My Maps:
www.google.co.uk/maps/about/mymaps
- Microsoft 365:
www.microsoft.com/en-gb/education/products/office

Information and ideas

- Interactive bug identification tool:
www.buglife.org.uk/bugs/identify-a-bug
- Bugs Count (national survey):
www.imperial.ac.uk/opal/surveys/bugscountsurvey
- Invertebrate identification guide (under 'Common invertebrates'):
www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/opal/Invertebrates-guide--UPDATED-FINAL.pdf
- iSpot (identifying wildlife): www.ispotnature.org
- Picture Insect: Bug Identifier on the App Store
- More on classification keys: www.mensaforkids.org/teach/lesson-plans/classifying-animals

Unit outcomes

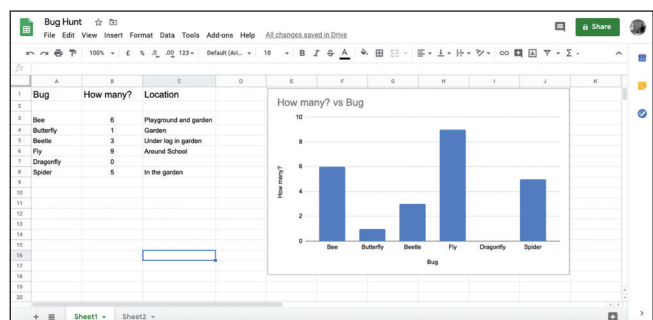
Below are some examples of the outcomes you could expect from this unit.



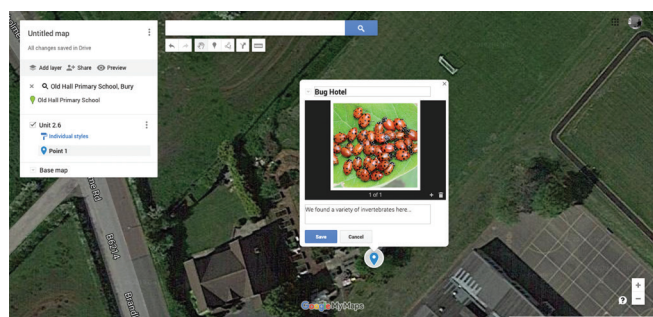
Session 1: Using a bug classification key



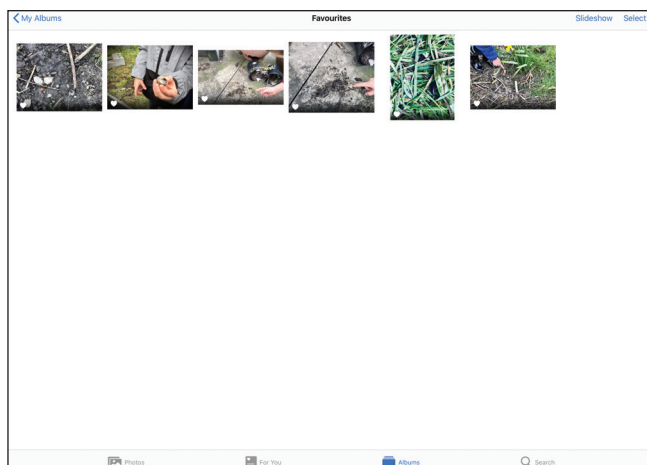
Session 2: Bug hunting



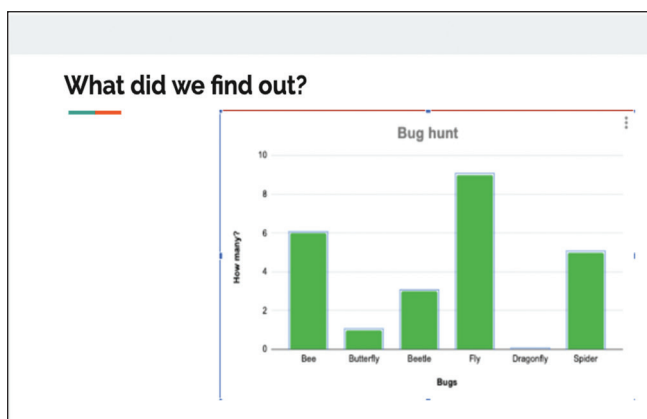
Session 4: Creating a chart from the data



Session 5: Inserting and labelling photos onto the map



Session 3: Choosing which images to use



Session 6: Creating a summary of what has been discovered