



Investigating and analysing changes to bird populations in Wales

Time needed for activity

You could work through the suggested activities over several sessions or you can pick and mix activities as you see fit. Each activity will take approximately 2 hours.

Location

Outdoors and indoors

Context

This activity plan highlights the importance of sustainably managing our natural resources, focusing on the causes of changes to bird populations in Wales.

Natural Resources Wales' purpose is to pursue sustainable management of natural resources in all of its work. This means looking after air, land, water, wildlife, plants and soil to improve Wales' well-being, and provide a better future for everyone.

Curriculum for Wales

Science and Technology

- **What matters** - Being curious and searching for answers is essential to understanding and predicting phenomena.
- **What matters** - The world around us is full of living things which depend on each other for survival.
- **What matters** - Computation is the foundation for our digital world.

Mathematics and Numeracy

- **What matters** - The number system is used to represent and compare relationships between numbers and quantities.
- **What matters** - Statistics represent data, probability models chance, and both support informed references and decisions.

Humanities

- **What matters** - Enquiry, exploration and investigation inspire curiosity about the world, its past, present and future.
- **What matters** - Our natural world is diverse and dynamic, influenced by processes and human actions.

Digital Competency Framework

Completing this activity provides opportunities to meet the following strands of the Digital Competency Framework.

Interacting and Collaborating

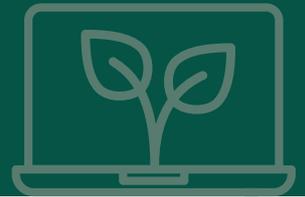
- Communication
- Collaboration

Producing

- Planning, sourcing and searching
- Creating

Data and computational thinking

- Data and information literacy



Resources and equipment

- Resource cards – Factors that cause bird populations to fluctuate
- Bird id websites, apps, posters and books
- Access to computers – spreadsheet packages
- Clipboards
- Pencils
- Paper

Background information

As birds occupy a wide range of habitats, they are considered a good indication of the health of the overall biodiversity of Welsh wildlife. Long-term data on trends in bird populations exist, allowing for comparison between the short and long-term population trends and for conclusions to be made as to whether populations are declining or increasing.

Activity 1 - What's visiting your grounds?

1. Introduce the activity by asking your learners what species of birds they have observed in their local area. What can they tell you about them? Equip your learners with clipboards, pencils and paper and give them the opportunity to spend some quiet time to sit back and see what birds visit your settings' grounds. Alternatively set spending twenty minutes with nature, observing and recording what birds visit their garden as homework. Depending on the time of year, you could link into the RSPB's Big Schools' Birdwatch which takes place in January each year. Not only will taking part contribute towards citizen science but it will also provide you with a useful bank of data to manipulate and interrogate with your learners.

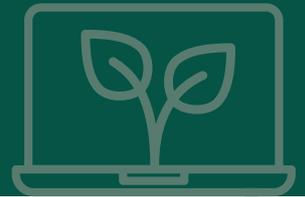
Learners should only keep a note of the birds that land in the area they are observing – not those flying over. To avoid double counting, they should record the highest number of each bird species seen at any one time – not the total number of birds that they count during the time they spend birdwatching.

Keep a note of the date of when your survey is undertaken so data comparisons can be made year on year. There may also be opportunities to carry out a survey each term to see if the observed species change.

2. Ask your learners to enter their findings into an Excel spreadsheet or Google Sheet and ask them to interrogate their data:
 - Which bird species had the highest number of visitors?
 - Which bird species had the lowest number of visitors?
 - How many birds in total did they have visiting?

Ask your learners to display their results on a bar graph or pie chart.

If you do repeat this activity during different times in the year or over several years, what does the data tell your learners? If populations have fluctuated encourage them to think of what possible reasons, there might be for the increase/decrease. Further research may be required but learners could consider the bird species' local food sources, how their habitats could have changed and what impact, particularly extreme seasonal weather each year, might have had on local populations.



3. Based on your learners' results, pick three or four of the most common birds that visited the local area. Using books, apps or websites, ask your learners to research and compile a fact file of information on one of the species. They could include information such as:

- Common name
- Latin name
- Average wingspan
- Average weight
- Life expectancy
- Diet
- 3 facts
- A drawing or a photo

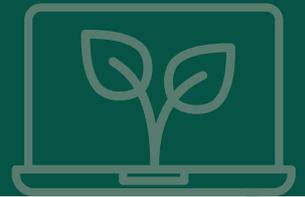
Once complete, their work could be combined to create a group bird fact file or their own birds 'Top Trumps' game.



Activity 2 - Factors affecting bird populations

Explain to your learners that research shows that bird populations fluctuate. Ask them to think about what factors may influence bird numbers. You may wish to use our 'Resource cards - Factors that cause bird populations to fluctuate', to aid discussion.

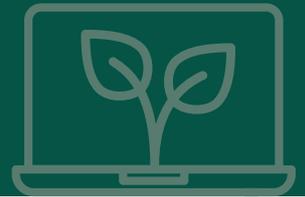
- **Changes in agricultural practices**
 - Removal of hedges to create bigger fields.
 - Draining land in order to house more animals on the land.
 - Ploughing to the edges of fields to increase the planting area.
 - Increase in the use of chemicals - pesticides and fertilisers can kill many of the insects our native birds feed on. Some birds who then accidentally ingest the chemicals are poisoned.
 - Land is given less time to replenish between crop harvesting.
- **Loss of habitat** - woodlands, grasslands and meadows decrease due to population growth and the demand for housing increasing.
- **Changes in gardens** - natural lawns and hedges have been replaced with artificial grass, decking, gravel and fences meaning there is less land for birds to nest and less available food.
- **Increase in the number of cars** - with more vehicles on the roads, birds are at a greater risk of being killed or injured by passing cars. Birds like ducks and geese who lead their young across roads to find water and low-flying blackbirds, are particularly at risk.
- **Predation by cats** - the Mammal Society estimate that cats catch up to 27 million birds on average over the spring and summer in the UK. There is no scientific evidence however that this is causing bird populations to decline as cats tend to take weak or sickly birds which may well have died naturally anyway.
- **Oil pollution** - oil spillages at sea can be fatal to many coastal birds. When oil congeals on birds' feathers, it causes them to mat and separate, impairing waterproofing and affecting their ability to stay warm in cold temperatures.
- **Changes in climate** - from periods of prolonged dry weather in summer to mild winters and snow in spring, the UK's seasons are changing, and this is having an impact on bird populations.
 - Periods of prolonged dry weather can cause a decline in the number of invertebrates, meaning less available food for birds.



- The average global temperature is going up as a result of climate change, leading to changes in seasonal patterns. Research shows that spring is starting earlier than it has in the past leading to the earlier emergence of spring plants and buds bursting earlier. This has implications for birds who want their chicks to hatch when food is most abundant. Erratic weather and changes in seasonal patterns can mean that flowers and insects flourish earlier than expected, meaning less available food when chicks hatch and birds really need it.
- On the flip side of the coin, some birds are benefiting from the warmer winters the UK has been experiencing as a result of climate change as there are less instances of harsh, cold weather to kill them off. Garden birds, such as blue tits and robins have seen an increase in numbers over the past few decades. This is thought to be because small, garden birds are often fed by humans and are more likely to survive the milder winters that have come about as part of climate change.

Activity 3 – Investigating fluctuating bird populations

1. Explain that the activity looks at how the population of the bird species the learners have identified has changed over time. The **British Trust for Ornithology's (BTO) Breeding Birds Survey** began in 1994 with a report being produced each year containing population changes. Resources and data provided that your learners could easily investigate and manipulate to see what has happened to the population of bird species across Wales include:
 - Breeding Birds Survey trend graphs – updated annually, these graphs show population trends by species.
 - Maps of population density and trends - maps showing both bird density estimates and population change for 49 common bird species.
 - Species lists by area – two types of species lists are available - the number of 1km squares from which a species was recorded and the total number of individual birds counted in all squares (based on maximum counts). These lists are updated annually.
2. Get your learners interrogating and studying the data. Below are some suggested key questions and tasks for your learners to consider and complete.
 - What do the population trend graphs reveal about the chosen bird species in Wales and their populations?
 - Has the population of the chosen bird species increased or decreased over the past 25 years?
 - Has there been a steady increase/decrease or have there been fluctuations over the 25 years?
 - Ask your learners to write 2/3 sentences to describe the trend they are seeing.
 - Use data from the 'Species lists by area – totals of individuals counted in Wales', to plot the data. What does the trend suggest?
 - Ask your learners to manipulate the data or give them the data in a pre-prepared table. What percentage change has happened to a population over different time periods?
 - To see the change in relative abundance of a population visually on an interactive map visit the **BTO's Mapstore**.
 - Thinking back to factors that can cause bird populations to fluctuate can your learners think of any possible reasons that this increase/decrease could have happened?
 - Set your learners the task of comparing population fluctuations of two different bird species e.g. a coastal species such as a puffin and an urban species e.g. house sparrow. For each species, discuss what the graph is telling us about them. Ask your learners to research the factors that influence and effect each species' population.



Follow up activity/extension

- Create charts and graphs to illustrate findings of these and other bird or animal species population changes.
- Compare population changes for species your learners have seen with species they might not see in their local area.
- Ask your learners to consider ways to support local bird populations – they could share their thoughts with a wider audience by doing a school assembly, making posters to raise awareness or by writing a piece in the style of a newspaper or magazine.
- Create a video to share on social media or with parents to influence others to support biodiversity.
- Make bird feeders for your settings grounds.
- Visit a local bird or nature reserve to do some real bird spotting.

Adapting for different needs/abilities

More support

- Adult to lead discussion and data interrogation.
- Reduce the number of birds to investigate.
- Provide easy to understand data and limit the number of records.
- Give your learners the explanation cards for Activity 2.

Less support

- Provide additional time to research further data on these birds or look for data on learner led choices.
- Ask your learners to come up with a hypothesis and then look to prove or disprove it e.g. 'I believe robin numbers in Wales have grown in the last ten years because there are more people feeding birds these days.'

Looking for more learning resources, information and data?

Please contact: education@naturalresourceswales.gov.uk or go to <https://naturalresources.wales/learning>

Alternative format; large print or another language, please contact: enquiries@naturalresourceswales.gov.uk
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