

Facilitator's notes

Introduction

Welcome to the Bitesize Biodiversity resource pack!

This resource pack was developed under the SFI-funded TRYBE project coordinated by the UCC MaREI Centre in cooperation with educators from the Irish Schools Sustainability Network. These resources are intended for senior cycle secondary school students and provide a simple introduction to key concepts in biodiversity education, including nature-based solutions and legislative protection for the environment. These notes provide a comprehensive overview of how these resources are intended to be used, answers to questions asked within the resources, and useful background information to help you answer your students' questions.

While these resources were developed primarily with a classroom environment in mind, they are also applicable to informal learning environments, such as in clubs, community groups, or at home!

How to use these resources

These resources are intended for mixed delivery. *State of Nature*, *Nature-based Solutions* and *Nature Restoration Law* all contain elements of traditional lecture-based delivery with many opportunities for class engagement, through interactive elements such as videos and hyperlinks, through worksheets and activities (such as 'fill in the blank' activities), and through question and debate prompts. *Nature-based Solutions* also provides ideas for outdoor biodiversity-friendly activities for students to do at home, in school, or in their community. The *Biodiversity Calendar* provides a list of 12 eco-friendly activities to do across the year and more information can be found in the optional additional resource *Gardening for Biodiversity*. The *Nature Restoration Law* resource is highly interactive and will be explained in greater detail below.

You may wish to print slides which prompt children to write on them - these slides are marked with a printer icon.



These resources are inspired by the existing Bitesize Biodiversity resources. Whenever you see this bumblebee icon throughout this resource pack, it means you can click on it to be brought to a relevant Bitesize Biodiversity resource.



Course objectives

- To articulate what is meant by biodiversity and to understand its importance to the health of both the planet and humans
- To understand the key reasons why biodiversity is facing a crisis
- To participate in individual and group activities around biodiversity education and to appreciate the power of individual and group climate action
- To develop comprehension, research, and debating skills

Lesson plans

State of Nature

- Objectives:
 - Understand the importance of biodiversity
 - Appreciate the causes and consequences of nature degradation and biodiversity loss
 - Appreciate the consequences of habitat loss
 - Recall key facts about the state of nature in Ireland and the EU
- Estimated lesson blocks: 1

Nature-based Solutions

- Objectives:
 - Understand the concept of nature-based solutions
 - Be able to explain how nature-based solutions fit in to climate mitigation
 - Commit to a nature-based solution at home, in school, or in your community
- Estimated lesson blocks: 2

Nature Restoration Law

- Objectives:
 - Understand the origins of the Nature Restoration Law
 - Appreciate the role of different EU institutions in law-making
 - Be able to comprehend and keep track of information from interactive videos
 - To feel confident in expressing personal opinions and to be open to changes in opinion based on evidence or others' arguments
- Estimated lesson blocks: 3

Optional additional resource: *Gardening for Biodiversity*

- Objectives:
 - Appreciate the role of small insects and creatures in sustaining biodiversity
 - Understand the basics of caring for wild birds
 - Appreciate the importance of plants in biodiversity
 - Appreciate the power of gardening in helping biodiversity
- Estimated lesson blocks: 3

Overview of resources

State of Nature

This presentation gives an overview of the current situation regarding biodiversity loss in Ireland and in the EU. The information in these slides is accurate as of August 2023.

Questions and answers:

Why is biodiversity important?

- Why is the spider monkey a climate activist?
 - It eats the fruit and spreads the seeds of hardwood tree. When these seeds germinate and grow, they grow into trees that absorb carbon dioxide.
- How many species are on Earth that we know about?
 - 1.6 million.
- Why is biodiversity important? List the reasons.
 - It provides the food we eat, our medicines come from nature, and it shelters and protects us.
- How are humans harming biodiversity?
 - Changes in land use, use of fertilisers, hunting animals for meat, and climate change.
- What can we do to help?
 - Cut our carbon emissions, leave space for nature, and protect areas where there is lots of biodiversity.

Similarities and differences exercises

- Farmland
 - Similarities: both pictures show grassy green farmland
 - Differences: picture on the right has more hedgerows which are better for biodiversity
- Forests
 - Similarities: both pictures show forests
 - Differences: the left forest is more diverse (as seen by the range of different types of tree visible) - the right forest is a monoculture made of conifer trees, which has been artificially planted and is less biodiversity-friendly
- River
 - Similarities: both pictures show meandering rivers in rural areas
 - Differences: the riparian zone (the vegetation growing on the banks of the river) in the left river is much healthier - meanwhile, the same zone on the river on the right is relatively bare and less biodiverse.
- Trinity College lawn
 - Similarities: both pictures show the lawn outside Trinity College.
 - Differences: the picture on the left shows the lawn after a no-mow period, with many wildflowers and opportunities for pollination. This is an easy activity to do at home to help biodiversity! However, pre-mixed packets of seeds may not always result in a distribution of flowers which are naturally found in nature, so do your research before buying these seeds.

State of nature in the EU map graph

- What does this map show?
 - The distribution of habitats in good and bad condition in the EU.
- What stands out to you about this map?
 - Students may provide any insight about the map that stands out to them.
- From reading the map, which countries do you think have the best kept habitats and which have the worst?
 - Best: Romania, Estonia, Greece. Worst: Belgium, United Kingdom, Denmark.

Fill in the blank activity solution

"To paint a picture of just how significant that role is, start by imagining a plate of your favourite food. Now mentally throw 1/3 of that food away. This is a small taste of how radically different our lives would be without bees and other pollinators. Approximately one in every three bites of food comes from animal pollinated species."



"Practices associated with large-scale modern farming, such as land clearing and the use of agrichemicals, have all contributed to a steep decline in pollinators – which only undermines the industries' future. The loss of pollinators threatens not only the health and diversity of Earth's ecosystems, but also global food security and billions of dollars worth of crops each year, not to mention millions of jobs in associated agricultural industries."

"Hand pollination is a painstaking process, one in which farmers individually pollinate each tree's blossoms using a 'pollination stick' – a thin bamboo pole topped with a brush made of either chicken feathers or even cigarette filters. This brush is dipped into a jar of pollen to saturate it, then rubbed against the stigma of the trees' flowers."

Word bank:

favourite jobs throw bees industry dollars painstaking agrichemicals health feathers dipped flowers
China bamboo different pollen wasps fruit bites pollinators

Nature-based Solutions

This resource provides an overview of the concept of nature-based solutions and gives an insight into the practical application of nature-based solutions in climate mitigation and adaptation.

Questions and answers:

Fill in the blank activity solution



INTRODUCING THE CONCEPT OF NATURE-BASED SOLUTIONS (NBS)

Nature-based Solutions can help us address climate change and the loss of habitats and species, otherwise known as biodiversity loss. Instead of using man-made solutions, we can work with nature to reduce the impacts of climate change and give back to nature. **Co-benefits** are a key concept in Nature-based Solutions: the same Nature-based Solutions can help the local nature of an area while also protecting humans against climate change.

Let's look at an example! Have you ever noticed that inner cities feel hotter than the suburbs or the countryside? This is because there are often fewer trees in inner cities, causing urban heat. We can fix this by planting trees which create shade and reduce air pollution. Having more trees in inner cities also helps animal and insect populations, providing food and shelter. For example, holly trees provide dense, shady cover to people on the street while also feeding caterpillars, bees and hosting birds nests. Another example involves coastal flooding: mangrove trees and marram grass can minimise the effects of flooding and storm surges on humans while also providing shelter for wildlife, such as birds, fish, and other marine life.

Word bank:

marine nature consequences cool bird change protecting humans climate plants urban nests
flooding erosion heat pollution biodiversity animal impacts caterpillars impacts people

Flood barriers

- The marram grass and the flood barrier do a similar job. What is that job?
 - To protect communities from flooding.
- Which one do we call a "nature-based solution" and why?
 - The marram grass is a nature-based solution because it uses nature instead of man-made solutions to address the same problem.

Tree cover

- How are the trees and canopies similar in this context?
 - They both serve the purpose of increasing the shade cover on the street.
- Which one do we call a "nature-based solution" and why?
 - The trees are a nature-based solution, because this option uses nature to create shade instead of man-made objects (canopies).

Infrared photograph of street

- How is this picture linked to the last slide?
 - Both slides show trees being used to increase shade cover and decrease urban heat - this slide shows the differences in temperature using infrared.
- What is the picture showing us? Give as much detail as you can using your numeracy skills.
 - This picture shows us the difference in temperature between the road (61°) and the shade under the tree (34.5°). Students should use the temperature scale on the right to answer this question.
- What are the co-benefits of this solution?
 - Trees provide shade for humans, while also providing food and shelter for animals and birds, and potentially also pollination for bees and wasps (depending on the variety of tree).

Boglands

- Guess the nature-based solution used here!
 - Rewetting boglands.
- What are some co-benefits of this nature-based solution for nature and for humans?
 - For humans, rewetting boglands can help to mitigate flood risk in low-lying areas as the bogland soaks up and retains water which might otherwise damage property and livelihoods. For nature, re-wetting boglands can be a lifeline for species which have been driven out of their natural habitats because of human activities, such as peat-cutting.

Rooftop gardens

- Guess the nature-based solution used here!
 - Rooftop gardens.
- Count the number of trees in both pictures. Which do you think is better for nature and for people?
 - Picture 1: 0, picture 2: 27
 - The second picture is better for nature and for people. Rooftop gardens allow pollinators a safe place to collect pollen away from traffic and people, while people can use rooftop gardens as a nature escape or to grow their own food.

Nature Restoration Law

Nature Restoration Law is intended to instill a sense of curiosity in students about the political aspects of biodiversity conservation, the role of citizens in political decision making, and the competing perspectives and interests that exist surrounding environmental politics. Students should complete *Nature Restoration Law* with an enhanced ability to advocate for their own viewpoints and with an appreciation for the importance of keeping an open mind when debating.

Questions and answers:

Tweets from European political parties

- Are the parties **for** or **against** the nature restoration law?
 - The EPP is against - Renew Europe is for.
- Based on what you have read, why do you think different political parties would have different views on the Nature Restoration Law?
 - Students should examine the previous slide to answer this question.
- Where do you stand? Are you **for** or **against** or **neutral**, and can you explain why?
 - This question provides an opportunity for students to express a tentative opinion, but should not be expected to have yet developed a comprehensive answer.

RTÉ video

- Where do you think Pat, Paul, and Oonagh stand on the Nature Restoration Law?
 - Pat is against, Paul is neutral, Oonagh is for.
- What issues are Pat and Oonagh concerned about?

- Pat is concerned about the Nature Restoration Law destroying Irish peat farming heritage and that too much land will be taken out of production. Oonagh is worried about dwindling bird populations.
- What is your opinion?
 - Students are expected to provide answers based on the content of the video, but are encouraged to think critically about the information presented. Students are expected to have an appreciation for the misinformation which may exist around a contentious issue such as this one.

Key quotes videos

- Watch these videos and write down some key quotes.
 - Students may write down any quote from the videos - quotes may be verbatim or from memory.
- Discussion questions:
 - "Change is difficult to adjust to." Give an example of this statement from the videos you have watched.
 - Students may refer to any of the videos presented so far where the theme of change has been discussed. The best example would be Pat the farmer from the previous slide who expressed concerns about the loss of Irish heritage.
 - Why do you think change is so difficult for us as humans?
 - Change is so difficult because of the uncertainties it presents and because it often challenges our core values.
 - Is there a way to make it easier for people to cope with change?
 - Education, awareness, and combatting disinformation. A just transition can ensure that no one is left behind on the way to a more sustainable future, particularly in rural areas.

Political quotes

These slides are intended to be used as a walking debate in which students line up on a spectrum of how much they agree or disagree with the topic prompts. Encourage your students to explain their positions and bring their learnings from the previous slides into this one.

- Grace O'Sullivan MEP
 - This quote uses high-level language which may be difficult for students to understand. In simpler terms, this quote highlights that the adoption of the Nature Restoration Law was a recommended action prescribed by the Irish [Citizens' Assembly on Biodiversity Loss](#). The Citizens' Assembly was a proportional and representative sample of the Irish population, meaning that the Irish population as a whole should be in favour of the legislation.
- Holly Cairns TD
 - This quote has been simplified to make it easier for students to understand. The original quote may be found in this [Irish Times article](#). This quote is intended to make students consider the challenges in communicating complicated issues to the public when politicians themselves may not necessarily fully understand the issues.
- Concerned scientists quote
 - This quote is an excerpt from [this statement](#) made by a group of concerned scientists, led by Guy Pe'er (Helmholtz Centre for Environmental Research, Germany) with the aim of

counteracting some key pieces of misinformation often spread about the Nature Restoration Law. One key term students may struggle with is Sustainable Use Regulation (SUR), which refers to a package of legislation aiming to reduce the environmental impact of the EU's food system and to mitigate the economic losses due to biodiversity loss.

Nature Restoration Law - Extra resources

The extra resources at the end of *Nature Restoration Law* are intended for an older audience of students who are particularly interested in the role of the EU in nature conservation and who may feel inspired to take political action.

How does democracy work?

This slide gives a blurb introduction to the concept of democracy by explaining the origin of the word 'democracy'. It then encourages students to practice democracy in action by holding a class president election.

How does EU law-making work?

EU law making is a collaborative process involving the European Commission, the European Parliament, and the Council of the EU. Each of these institutions is key to the democratic legitimacy of the process: the Commission represents the EU's overall interests, the Council represents national governments, and the Parliament represents EU citizens.

The EU ensures democracy in its decision making by having its decision-making institutions be elected by its citizens, ensuring that citizens always have a voice in the EU. The European Parliament is directly elected every five years. In turn, the Parliament selects Commissioners to sit in the European Commission and represent various policy briefs. As such, the European Commission is indirectly elected. The Council of the EU comprises of ministers from the governments of the 27 member states who meet regularly on thematic issues, eg. finance, defence. As such, the Council of the EU is also indirectly elected by the people: voters select their governments, and the governing party selects its ministers, who then sit on the Council of the EU.

NB: Do not confuse the Council of the EU with the European Council! The European Council is the highest political body in the EU and comprises of the heads of governments of member states and is not involved in this process.

So how does EU lawmaking actually work? First, the European Commission will draft a legislative proposal and highlight the potential positive and negative impacts of this proposal. The Commission will then present these documents to the European Parliament and the Council of the EU. This kicks off a negotiation and amendment process where the Council and the Parliament will propose amendments to the bill. If the Parliament and the Council cannot find common ground, they will enter into a consolidation process which attempts to clear the deadlock. If successful, negotiations continue; if unsuccessful, the bill fails.

Have a look at this [flowchart](#) from the EU which explains the legislative process in more detail.

Protecting and conserving nature - challenges

This short article-style factsheet is intended to provide students with an overview of the challenges faced by decision-makers in balancing the need to protect and conserve nature using Killarney National Park as an example.

Activity: email your TD

This activity is intended for older students who are interested in directly engaging with their local politicians. Attached in this resource pack is a Word document containing an email template which you can distribute to your students to personalise and email to their local TDs. This slide also encourages students to write down some key questions which they could ask a TD at election time if they are canvassed.

Biodiversity Calendar

The *Biodiversity Calendar* is intended to be used as a print-out calendar which you can pin to a wall in your classroom (or distribute to your students to print out at home). This calendar includes monthly biodiversity-friendly activities which can be done in school or at home. These activities are intended to empower students to feel that they can do their bit to help nature.

Each month on the calendar describes one child-friendly activity (however, adult supervision is advised). The species which benefit from the suggested activity are highlighted. Each activity is first described and justified by outlining the positive impact of the activity on biodiversity. Detailed instructions are then provided and, where relevant, a clickable icon may be found which directs to a video tutorial:



Gardening for Biodiversity

This resource is included as an optional add-on resource and may be more appropriate for informal learning environments, such as at home or in clubs. This resource covers different species which are beneficial for biodiversity and comes with various activities which can be done outdoors or indoors. The focus of this resource is on how an individual can help improve the biodiversity of their locality through a simple activity such as gardening.