

STEAM EDUCATION FOR SUSTAINABLE DEVELOPMENT and FUTURES LITERACY

SGD13 Climate Action and Sustainable Development



Programme Phase: Strand 1 Earth Systems, Life and Environment

Leaving Certificate Support Lessons

TOPICS: Biodiversity, Environment, Science, Sustainability



SDG 13 Strand 1 Support

Climate Action and Sustainable Development



Climate Action & Sustainable Development

Strand 1

Earth Systems, Life and Environment

Seven Supporting Lessons



Module Summary: Strand 1 CASD Support

This curated set of seven lessons from Muinín Catalyst programmes is designed to support learners and teachers engaging with Strand 1 of the Climate Action and Sustainable Development (CASD) Senior Cycle subject.

Grounded in sustainability, systems thinking, and innovation, the lessons provide scaffolded activities that support learners to explore the complexity of Earth systems, biodiversity, and the interdependence of life and environment. Lessons cultivate 21st-century skills that help learners connect scientific understanding with purposeful climate action.

The lessons draw on design thinking and inquiry-based learning, empowering young people to co-create practical responses that balance human needs with planetary boundaries.

For teachers, the seven lessons offer ready-to-use resources and structured support that align with the NCCA's vision for a values-led, student-centred Senior Cycle. They promote reflection, collaboration, and active citizenship while equipping educators to facilitate meaningful conversations about climate, biodiversity, and sustainability.

For learners, the lessons are an invitation to see themselves as change-makers—connecting knowledge of Earth systems and ecosystems with purposeful action. Through this journey, learners build not only scientific understanding but also the confidence, empathy, and resilience required to navigate a rapidly changing world.

These lessons bridge curriculum and action, helping schools embed Strand 1 in a way that nurtures knowledge, skills, and values, while inspiring hope and empowering students to become ethical leaders and active stewards of the environment. The seven supporting lessons and resources are aligned to support specific learning outcomes from in the [CASD 25 / 26 Through Route](#)

S1.3, and 3 lessons taken from our [game design programme, Climate Change \(CCE\)](#) see here for [programme overview](#)

S1.3: CCE: Lesson 2 What is Climate Change?

In this lesson, learners are introduced to the foundational concepts of Climate Change.

Learners will be introduced to the difference between weather and climate, begin to understand the changes in patterns and recognise the impacts that this can have.

Resources: Video: What is climate change? Part 1 and 2, Worksheet: Activity Question, Discussion Questions and Infographic: Impact of 2C vs 1.5C, Support: CCE 2 - 4 Teachers' Guide

S1.3: CCE: Lesson 3: The Cause of Current Climate Change

In this lesson, learners are introduced to the current causes of climate change. Through an exploration of the process of energy transport (radiation), the relationship between greenhouse gases and how heat is trapped, learners will develop an awareness on the causes of global warming and how this contributes to contemporary climate change.

Resources: Video: 'The Cause of Current Climate' Change, Support: CCE 2 - 4 Teachers' Guide

Week 27: Three lessons from our '[Seeding Sustainability](#)' Programme's Module 3, [Examining Edible Medicinal Flora](#) supplement learners ability linked to biodiversity

S1.6 Lesson 1: Biota, Flora and Fauna

Flora and Fauna also contribute significantly to the ecosystem of the Earth. This lesson will build and consolidate key vocabulary that learners will use throughout the micro-module. It encourages the development of research skills to develop an awareness of the different types of edible plants that can be found growing in Ireland.

Resources: Worksheet: Wild Irish Edibles, Flipped Classroom Task: Biota, Flora and Fauna

S1.6 Lesson 2: Habitats

Over 100 habitat types have been classified in Ireland, boasting a rich array of flora and fauna. This lesson asks learners to use independent and collaborative research skills to discover information about habitats in Ireland and the different types of flora and fauna that can be found in each.

Resources: Worksheet: Habitats, Flora and Species Webquest

S1.10 Lesson 3: Local Flora/ Fauna Scavenger Hunt

Flora and fauna is linked with the air we breathe and the food we eat and are interdependent. This lesson connects learners with their local, natural place as they are tasked with identification, information-gathering and evaluation of local flora and fauna.

Resources: Worksheet: Local Flora/ Fauna Scavenger Hunt, Optional Extra Worksheet: Web Quest: 1 Wild Irish Edibles (Lesson 1)

Week 29: 2 lessons from our [Eco-Agency: Youth Led Climate Action programme](#), which can be found [here](#)

S1.12 Lesson 12 Eco Agency: Youth Movement for the European Nature Restoration Law

In this lesson, learners are introduced to the Youth Movement around the European Nature Restoration Law. Learners will delve into the law's details, its roles in health and conservation, and its connections to the UN Sustainable Development Goals and Earth Charter.

Resources: Worksheet: Introduction to Youth movement for the European Nature Restoration Law, Mind Mapping, Teachers' Guide: Meditation Script, Introduction to Youth movement for the European Nature Restoration Law, Discussion Cards

S1.12 Lesson 13: Eco Agency: The European Nature Restoration Law

In this lesson learners will learn more about the law, how it supports health and planetary conservation and explore it's links to the UN Sustainable Development Goals and the Earth Charter.

Resources: Worksheet: Law for Nature Instructions including Goals and Pillars, Teachers' Guide The European Nature Restoration Law: Planetary conservation and health, Information Cards 1 & 2

Using the Resources:

If you wish to use these resources, we can offer an induction and online support throughout the module to help you plan integration into your projects and timetable. To register for this option, please contact us e:hello@futurefocus21c.com For more information on the resources please visit www.muinincatalyst.com

Setting up an online learning environment for the lessons on this module:

Our lessons integrate the use of virtual learning environments. To ensure seamless use of our lessons, a module should be set up on your school's virtual learning environment, such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers. If your virtual learning environment does not support document sharing, we recommend OneDrive or Google Drive.

You can also use Google Sites or Microsoft Sway to encourage learners to present their work over the year - this can easily be set up to reflect the aims of TY and provide a showcase for their work as well as assessment tool.

Setting up a Canva Education account:

As our lessons integrate design, activities and additional activities may refer to Canva. Educators and schools can open a free Canva for Education account by registering [here](#): Canva for Education provides primary and secondary school teachers and students with premium features and templates. You can then also set up lessons and invite your learners to the class.

Expertise in developing the resources including design, layout and overarching pedagogical framework have been developed by Future Focus21c. Future Focus21c is Rebecca White and Anita McKeown, and a network of collaborators and content developers, nationally and internationally. Anita and Rebecca, have close to 5 decades of experience between them working across the arts, education, inclusive design place-based regeneration, STEAM education and sustainability, in both formal and informal settings with diverse learners and communities.

- Dr Anita McKeown, FRSA, FIPM, FGI, MEI, is an award-winning artist|scholar and STEAM educator, co-designing values-based leadership through education and community processes at the intersection of art, equitable placemaking, Open Source Culture and Technology (ethical and ecological implications). She is also a certified as a Earth Charter Education for Sustainable Development Educator; Inclusive Teaching and Learning Educator, Enterprise and Innovation educator, Trauma-informed practitioner and VUCA world design
- Ms. Rebecca White: is an educator, consultant, trainer and curriculum developer, focusing on STEAM education, project-based, student-led learning and professional development for place-based learning. She is the Senior Learning Advisor for the Ocean Race and an Award-Winning Programme Developer
- External Expertise: We engage with external experts to bring contemporary and real-life knowledge to our resources. By working with these experts, we can ensure that our resources include future-focused learning and innovative ideas to expose learners to world-leading research in a digestible and accessible format. Learners are encouraged to critically think about and engage with knowledge and content in a learner-led and project-based manner.

For more information or to access online support in integrating the programme into your existing teaching please contact: hello@futurefocus21c.com

References and full programmes can be found here www.muinincatalyst.com/courses

SDG13 Climate Change Engage Game Design



SDG13 Climate Change Engage Game Design

Lesson 2: What is Climate Change?

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: What is Climate Change?

In this lesson, learners are introduced to the foundational concepts of Climate Change. This will enable them to understand more about Climate Change and its impacts and gain knowledge that they can include within their game design.

Learners will be introduced to the difference between weather and climate, begin to understand the changes in patterns and recognise the impacts that this can have.

Vocabulary: Average Conditions; Climate Change; Extreme Weather Events; Weather

In this lesson, the learner will:

- learn foundational concepts of climate change
- understand the difference between weather and climate
- gain insight into changing weather patterns over time
- understand the scale of the problem of climate change
- understand the importance of keeping climate warming at 1.5 degrees C
- understand the impact of 2 degrees C warming

Materials

- Video: What is climate change? Part 1 and 2
- Worksheet: Activity Question
- Worksheet: Discussion Questions and Infographic: Impact of 2C vs 1.5C
- Lesson 2-4 Teachers' Guide
- Internet access
- Pens, pencils
- paper
- Blackboard / Whiteboard

4 QUALITY EDUCATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



SDG13 Climate Change Engage Game Design

L2: What is Climate Change?



Activity Instructions

Activity 1 Understanding Climate Change (20 mins)

1. Ask learners if they can describe the difference between weather and climate. They can share ideas with a partner before a whole class share.
2. Put the following questions on the board and read through as a whole class.
 - How would you describe climate?
 - How would you describe climate change?
 - How do you think climate has changed in Ireland?
 - How would you describe weather?
 - What is an extreme weather event?
 - How are extreme weather events related to climate change, what are the impacts?
 - Have you recently experienced an extreme weather event? What were the impacts on houses, streets, agriculture, etc.? How was human health affected?
3. Play the Video: What is climate change? (Part 1), asking learners add to their answers.
4. Divide learners into pairs to share answers before discussing as a whole class.

Activity 2 How hot is the new climate? (20 mins)

1. Watch Video: What is climate change? (Part 2) and make notes under the following headings:
 - Global climate changes
 - Changes in nature (melting ice - species migration - species disruption)
 - Paris Agreement
2. Working in the same groups, compare notes and use the Infographic to discuss the worksheet questions.

Activity 3 What are you willing to do? (10 mins)

1. In pairs, discuss what you would be willing to do to keep the temperature from reaching 2 degrees Celsius). Would you eat less meat? Would you not fly for vacation? Would you buy less clothing/ second-hand clothing? Would you turn down the heat in your home?

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design

L2: What is Climate Change?



EXTENSION / REDUCTION ACTIVITIES

Reduction: for a shorter lesson, only complete Activity 1 & 3.

Extension: For a longer lesson, ask learners to reflect on how a changing climate makes them feel. Discuss what someone can do to handle fear of something that seems out of one's control. Refer to the Force of Nature discussion guide on eco-anxiety- see Media Box.

Option B: Brainstorming for game design - In small groups, brainstorm things that will be more difficult to access as it gets warmer - how might this inform their game design? Share ideas as a whole class.

Option C: Mini research task, research the effects of climate change on local flora and fauna.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Activity 1 Video: What is Climate Change? Part 1 <https://youtu.be/t4csCQuzDf0>

Activity 1 Video: What is Climate Change? Part 2 <https://youtu.be/0NbmJOHkPmY>

Infographic: Comparing 2C to 1.5C <https://www.climatecouncil.org.au/resources/infographic-the-difference-between-1-5-and-2-degrees-warming/>

Force of Nature Discussion Guide <https://www.forceofnature.xyz/discussion-guide>

Walsh, S. (2012). A summary of climate averages for Ireland, 1981-2010. Climatological note no. 14. Met Éireann. Retrieved from <http://hdl.handle.net/2262/70490>

Met Éireann's role in climate change <https://www.met.ie/climate/climate-change>

Before the Flood Documentary (95:00min) <https://www.youtube.com/watch?v=zbEnOYtsXHA>

Local Trip / Expertise / Additional Work and Assessments

Ask learners to calculate the average temperature/ rainfall from their nearest weather station. You could also discuss extreme weather events that recently have happened locally/ elsewhere. Weather Observation Website: <https://wow.met.ie/>

Find out and organise a visit and talk to your local weather station, or invite them to link with the learners.



LESSONS 2 - 4 ARE THREE INTERLINKED LESSONS AROUND THE FUNDAMENTAL CONCEPTS OF CLIMATE CHANGE :

- **WHAT IS CLIMATE CHANGE?**
- **THE CAUSE OF CURRENT CLIMATE CHANGE**
- **CLIMATE ACTION: ADAPTATION AND MITIGATION**

LESSON 2 - WHAT IS CLIMATE CHANGE?

Climate is the long-term average weather conditions over time and their variation. When we change the climate, we are changing this average weather pattern. With current climate change, the earth is getting rapidly warmer.

We are experiencing sea level rise, higher, more intense rainfall, and more extreme weather events like heat waves, droughts, flooding, wildfires and storms with high winds. These events make it more difficult to farm, which may impact food supplies.

Changing the climate displaces plants and animals from places that they used to live in and may expose them to novel disease. The adverse effects of climate change can make us anxious as we are not sure what is to come and how we will deal with these changes. Talking about these feelings and finding community in living through and adapting to the change is very important.

The media box resources also contains a link to the film 'Before the Flood' which is a useful background summary. This is available for renting so maybe something that is integrated into TY as a general all pupil activity it looks at the sources, techniques, media and impact with a mostly American perspective but does include China, India, Indonesia, and the Pacific islands.

LESSON 3 - WHAT IS THE CAUSE OF CURRENT CLIMATE CHANGE?

The climate is driven by the amount of energy that drives the climate system. Energy is transported from the sun mainly in the form of visible light, whereas once this energy is absorbed at the Earth's surface it is transported from object to object in the form of infrared radiation.

The climate can be changed for two reasons; either there is more solar radiation received on Earth and/or there are more greenhouse gases in the atmosphere that keep infrared radiation in the atmosphere.

Changes in greenhouse gas concentrations in the atmosphere are due to human activities such as burning of fossil fuels, but also land use changes such as deforestation, soil degradation, draining of peatlands, and livestock agriculture as well as natural processes such as volcanic eruptions and meteorite impacts.

Changes in solar radiation are mostly due to changes in the distance of the earth to the sun, which happens on a geologic time scale. However, some variation is due to changes in solar activity and now the melting of snow and ice on Earth, as this decreases the amount of sunlight reflected.



LESSON 4 - CLIMATE ACTION- MITIGATION AND ADAPTATION?

Climate action is twofold, we have to reduce greenhouse gas emissions but we also have to adapt to the new climate that we have created by our greenhouse gas emissions. Our greenhouse gas emissions per person are higher in Ireland than elsewhere in the EU and much higher than elsewhere in the world. We are emitting more than our fair share. We are emitting more than our fair share. To cut our greenhouse gas emissions we need to measure our carbon footprint, so we know what activities emit them.

Generally, everybody can help reduce greenhouse gas emissions by organising for climate action, choosing green transport, saving energy consuming less, helping nature and eating less meat and dairy products. This lesson introduces learners to the concepts of mitigation and adaptation, as well as encouraging climate action.

Mitigation: Mitigation: In order to reduce greenhouse gas emissions, we need to become aware as to where these emissions come from. The most abundant greenhouse gas that is contributing the most to global heating is carbon dioxide (CO₂). CO₂ is a gas we breathe out after we produce metabolic energy in our bodies. It is produced when we burn wood or fossil fuels, like oil, coal and gas, so it is produced when heating our homes and in transport and energy systems. Drained (and harvested) peatlands also emit large amounts of CO₂. Methane (CH₄) is the second most abundant greenhouse gas. It is an important contributor to greenhouse gas emissions in Ireland as livestock agriculture produces a lot of methane (CH₄) through digestion (cows burping it out of their stomach) and from manure.

Adaptation: we need to live with higher sea levels and more extreme weather events, so we need to prepare for this. Ideally, we would do so by helping nature to help us, e.g. giving more space for nature in coastal ecosystems or flood plains.

Lesson 4 Case Study support:

Case study 1: Seagrass: restoring seagrass in Kilmore Quay, County Wexford (interview with a 7-year old boy and other participants in seagrass restoration project by Coastwatch (the Irish Coastal Environmental Group): <https://fb.watch/eb---r3uy7/> (RTE news, September 2021).

In this project, volunteers removed the invasive seaweed *Sargassum muticum* from seagrass meadows to allow light onto the seagrass). Coastwatch relies on volunteers to survey the coasts for seagrass presence, for seagrass restoration and for picking up litter around the coast. Benefits in terms of climate mitigation: seagrass is very efficient at capturing CO₂ from the atmosphere. Benefits in terms of climate adaptation: seagrass slows the action of waves and reduces coastal erosion.

Case study 2: Coastal dune: the Inchydoney Dune Conservation Project, Cork is educating the public about the impact of walking in the dunes can lead to erosion of the dunes. They are taking measures to recover eroded dunes and protect existing dunes from further erosion and organising beach clean ups. Benefits in terms of climate mitigation: some



carbon capture by dune grass. Benefits in terms of climate adaptation: dunes provide a natural barrier against coastal flooding and erosion.

- <https://www.southernstar.ie/news/our-dunes-are-dying-but-if-we-move-quickly-we-can-save-them-4218106>
- <https://www.facebook.com/Inchydoney-Dunes-Conservation-Group-101291461965770/>

References:

Blondel, J. (2019). How do birds adapt to a changing climate? Encyclopedia of the Environment. Institute de France, Académie des Sciences, University Grenoble Alpes. This webpage <https://www.encyclopédie-environnement.org/en/life/how-birds-adapt-changing-climate/> explains in detail how birds will be affected by climate change. Last accessed: June 2022.

Climate change post (2022). Ireland. <https://www.climatechangepost.com/ireland/>
The Ireland page contains links to footages of floods in Ireland on YouTube. There is also a specific write-up of coastal flood risks: <https://www.climatechangepost.com/ireland/coastal-floods/>

Devictor, V., Van Swaay, C., Brereton, T., Brotons, L. s., Chamberlain, D., Heliölä, J., . . . Jiguet, F. (2012). Differences in the climatic debts of birds and butterflies at a continental scale. *Nature Climate Change*, 2(2), 121-124. doi:10.1038/nclimate1347

Friedlander, B. (2021). Seven years of agricultural productivity growth lost due to climate change. Stanford Woods Institute for the Environment adapted from Cornell Chronicle. This website <https://woods.stanford.edu/news/seven-years-agricultural-productivity-growth-lost-due-climate-change> summarises the agriculture losses observed over the period 1961-2020 Last accessed: June 2022.

Maynooth University (2022). Press release: <https://www.maynoothuniversity.ie/news-events/maynooth-university-research-confirms-elevated-rates-sea-level-rise-dublin>

NOAA (2021). How does climate change affect coral reefs? National Ocean Service website, This website <https://oceanservice.noaa.gov/facts/coralreef-climate.html> contains an infographic that explains the impact of climate change and other human activities on coral reefs. Last accessed: June 2022.

Ortiz-Bobea, A., Ault, T. R., Carrillo, C. M., Chambers, R. G., & Lobell, D. B. (2021). Anthropogenic climate change has slowed global agricultural productivity growth. *Nature Climate Change*, 11(4), 306-312. There is also a short video where Ariel Ortiz-Bobea explains his research <https://news.cornell.edu/stories/2021/04/climate-change-has-cost-7-years-ag-productivity-growth>

Walsh, S. (2012). A summary of climate averages for Ireland, 1981-2010. Climatological note no. 14. Met Éireann. Retrieved from <http://hdl.handle.net/2262/70490>

CCE L2WS: ACTIVITY 2 DISCUSSION QUESTIONS



As you watch the video: 'What is Climate Change?' (Part 2), make notes here or in your notebooks under the following headings:

- Global climate changes

- Changes in nature
 - melting ice

 - species migration

 - species disruption

- Paris Agreement

Use the Infographic on the next page to discuss and answer the following questions below:

- What does it mean to lose more plant and insect species?

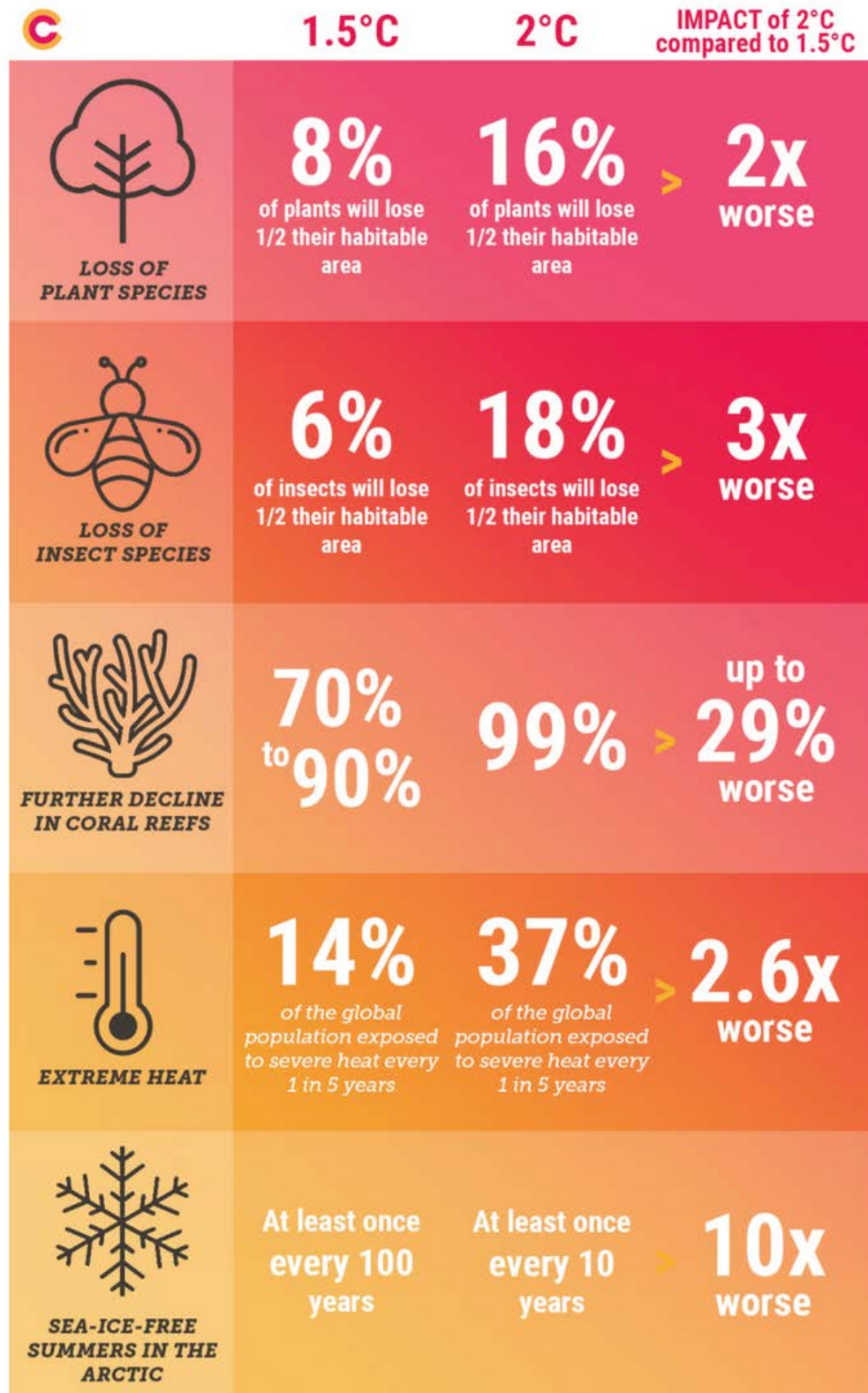
- What happens to these species?

- Why are coral reefs so badly affected by climate change?

- Why is it a problem to lose more ice?

CCE L2WS: ACTIVITY 2 DISCUSSION QUESTIONS

13 CLIMATE ACTION



C CLIMATECOUNCIL.ORG.AU | crowd-funded science information

Adapted from **WRI (07/10/18)** based on data from **IPCC (10/2018)**.

<https://www.climatecouncil.org.au/resources/infographic-the-difference-between-1-5-and-2-degrees-warming/>

SDG13 Climate Change Engage Game Design



SDG13 Climate Change Engage Game Design

Lesson 3: The Cause of Current Climate Change

Subjects: Design, Environmental Science, Game Design, Geography, Science, Technology

Lesson Title and Summary: The Cause of Current Climate Change

In this lesson, learners are introduced to the current causes of climate change. Through an exploration of the process of energy transport (radiation), the relationship between greenhouse gases and how heat is trapped, learners will develop an awareness on the causes of global warming and how this contributes to contemporary climate change.

This lesson builds on lesson 2 providing concrete knowledge learners might integrating into their game design.

Vocabulary: Concentration; Greenhouse Gas; Infrared (heat) Radiation; Visible Light

In this lesson, the learner will:

- Understand the difference between radiation from the sun and radiation from the Earth's surface and objects surrounding us
- Understand that the atmosphere is transparent to visible light, but not to infrared radiation.
- Be able to explain the greenhouse gas effect
- Understand what can change the amount of energy in the climate system and thus change the climate

Materials

- Video: 'The Cause of Current Climate' Change
- Support: Lesson 2-4 Teachers' Guide
- Internet access
- Pens, pencils
- paper
- Blackboard / Whiteboard

4 QUALITY EDUCATION



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SDG13 Climate Change Engage Game Design

L3: The Cause of Current Climate Change



Activity Instructions

Activity 1 : Showing changes in solar radiation and infrared radiation (40 mins)

1. Divide the learners into groups of 3-4.
2. Play video: 'The Cause of Current Climate Change' up until 2:20 mins. Encourage learners to make notes on the key ideas. Ask groups to discuss the following questions:
 - What is changing solar radiation?
 - What is changing greenhouse gas concentrations that trap infrared radiation?
 - Ask learners to look up what 'concentration' means if they don't know.

Go over each question as a whole class. Refer to Lesson 2-4 Teacher's Notes for support.

3. Watch the rest of the video, making notes on key ideas.
4. Discuss the following questions in their groups:
 - What processes increase the energy in the climate system?
 - Could there also be processes that decrease this energy?
 - What would these be?

Go over each question as a whole class. Refer to support: 'Lesson 2-4 Teachers' Guide'

5. Watch the video again in full, explaining that each group is going to produce an illustrated diagram to show the changes in solar radiation and infrared radiation. Ask learners to make more notes while watching the video a second time to gain more information on the changes in solar and infrared radiation.
6. Allow 10-15 minutes for the groups to work on their draft diagrams.
7. Swap draft diagrams with another group to compare ideas. Return drafts and work on a final version.
8. Share final versions of diagrams as a whole class. Discuss what is good about each diagram and what it highlights well.

Activity 2 Connecting Climate to Game Design (10 mins)

1. In small groups, consider how they could use this new information in the diagram in their game design. Brainstorm ideas.
2. Mix up the pairs and share and compare ideas.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One opinion they have about the activities, what did they like or how they would improve them

Use Post-its or a mentimeter survey - www.mentimeter.com to gather reflections

SDG13 Climate Change Engage Game Design

L3: The Cause of Current Climate Change



EXTENSION / REDUCTION ACTIVITIES

Reduction: for a shorter lesson, complete Activity 1 only.

Extension: for a longer lesson, complete Activity 1 and 2, then watch the video 'Understanding the Greenhouse Effect' (see Media Box). Conduct a simple Greenhouse Effect experiment - see Local Trip / Expertise / Additional Work and Assessments box.

Alternatively, the experiment can be conducted in the following lesson.

For an additional lesson play the Climate Negotiation Game:

<https://www.metlink.org/resource/climate-change-negotiations-for-schools/>

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

The Cause of Current Climate Change (4:49min) <https://youtu.be/4j5Qi1Sm0rw>

Understanding the greenhouse effect (7:09mins)

<https://www.museumoftheearth.org/changing-climate/greenhouse-effect>

Article: Undertake a simple greenhouse experiment

<https://www.familyeducation.com/school/global-warming/greenhouse-effect-experiments>

The long and short of transmission and absorption (4:37 minutes): <https://www.priweb.org/teach-climate-science-gallery/the-long-short-of-absorption-transmission>

Local Trip / Expertise / Additional Work and Assessments

Undertake a simple greenhouse experiment - as a class or in pairs

- Line a large open bowl with dark cloth or paper.
- Place the bowl in the sun and put an inverted paper cup in the bowl. Lay a thermometer across the top of the cup so that you are measuring the air temperature in the bowl.
- Note the temperature.
- Cover the bowl with a sheet of clear plastic wrap over the top of everything. Note the new temperature reading. The increase in air temperature is due to the trapped heat.

SDG15 Seeding Sustainability

MM3: Examining Edible / Medicinal Plants



MM3: Examining Edible / Medicinal Plants

Research and Development

Lesson 1: Biota, Flora and Fauna

Subjects: English, Geography, Home Economics, Irish, Science, SHPE

Lesson Title and Summary: Biota, Flora and Fauna

Biota is the term used for complete forms of life like bacteria, for example. Flora and Fauna are scientific words. In general, we use the term plants and animals life. The ecosystem is the biological community where the living beings interact with each other, from microorganisms to human beings. Flora and Fauna also contribute significantly to the ecosystem of the Earth. This lesson will build and consolidate key vocabulary that learners will use throughout the module. It encourages the development of research skills to develop an awareness of the different types of edible plants that can be found growing in Ireland.

Vocabulary: Biota, Edible, Flora, Fauna, Inedible, Medicinal, Perennial, Pollinators

In this lesson, the learner will:

- develop recording, analysis and evaluation skills
- explore and discover the meaning of biota, flora and fauna
- summarise information to create definitions
- create a digital vocabulary reference document
- match examples of wild Irish edible flora commonly foraged to their possible uses in food preparation and confirm ideas by accessing online information
- consider uses and create recipes
- develop collaboration and communication skills

Materials

- Flipped Classroom Task: Biota, Flora and Fauna
- Worksheet: Wild Irish Edibles
- Internet access



MM3: Examining Edible / Medicinal Plants

L1: Biota, Flora and Fauna



ACTIVITY INSTRUCTIONS

Activity 1: Vocabulary Consolidation- Biota, Flora, Fauna Flipped Classroom Task (15 mins)

Learners need to complete the FLIPPED CLASSROOM TASK (Biota, Flora, Fauna) before this activity.

- 1) Divide learners into groups of 4.
- 2) Compare digital vocabulary guides (FLIPPED CLASSROOM TASK) in small groups and add new ideas and examples.
- 3) Play a 3-4 minute game of taboo to review vocabulary. This can be played as a whole class, or in groups of 4.

TABOO

1. Select a word from the list (Flipped Classroom Task).
2. Describe the word, without using it!
3. Other players need to guess which word is being described.

Activity 2: Wild Irish Edibles (35 mins)

- 1) Divide learners into groups of 4 and direct them to the Wild Irish Edibles Worksheet. Go through the instructions and check understanding. Assign 4 words per group.
- 2) Instruct learners to look at the images and common names of some Irish edible flora, and match them to what they think the plants could be used to make.
- 3) Ask learners to check their ideas by accessing the [Wilderness Ireland Website](#) - see Media Box.
- 4) Use the discussion questions on the worksheet to share ideas in pairs.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks.
- Two things they found most interesting and would like to explore more.
- One – their opinion they have about the tasks.

Use Post-its or a mentimeter survey - www.mentimeter.com - to gather reflections

MM3: Examining Edible / Medicinal Plants

L1: Biota, Flora and Fauna



EXTENSION / REDUCTION ACTIVITIES:

Reduction: For a shorter lesson, complete Activity 1 only. Increase the length of time to play TABOO and work in groups to add new words to the vocabulary guide. A new column could be added to the guide- synonyms. Activity 2 can be completed in the next lesson.

Extension: For a longer lesson, spend more time on Activity 2; identifying possible edible uses for the wild flora (e.g., in ice-cream) and create a recipe of their own to later make.

MEDIA BOX (materials, online video links, extra resources, case studies etc)

Wilderness Ireland - Wild Foraging in Ireland <https://www.wildernessireland.com/blog/wild-foraging-ireland/>

12 Rules to follow when Foraging <https://www.tyrantfarms.com/beginners-guide-to-foraging-rules-to-follow/>

'Foraging Seaweed Spaghetti' (2:03 min) <https://youtu.be/cZeieNZopxk>

'Dandelion Coffee' (4:04 min) <https://youtu.be/P3n2iymAJAI>

'Irish Herbs, plant medicines growing in Dublin, Ireland' (14:00 min)
<https://www.youtube.com/watch?v=cLfcvi2i3x4>

LOCAL TRIP / EXPERTISE / ADDITIONAL WORK AND ASSESSMENTS

Look around the school to discover how many overlooked edible / medicinal species there are.

Visit a local herb garden and take a tour from a member of Tidy Towns or local botanist.

Take a trip to the coast to forage for sea spaghetti, sea kale or sea lettuce to prepare in Home Economics class.

Interview a local farmer/ garden centre and find out the vegetables and herbs that are grown.

MM3 L1 WS: BIOTA, FLORA AND FAUNA



FLIPPED CLASSROOM TASK (BIOTA, FLORA AND FAUNA)

Task:

Create a digital vocabulary guide on the theme of “Biota, Flora and Fauna”. This could be in the form of a Word or Excel document, a Google Jamboard, or a Mind Map.

Using a dictionary look up the following words.

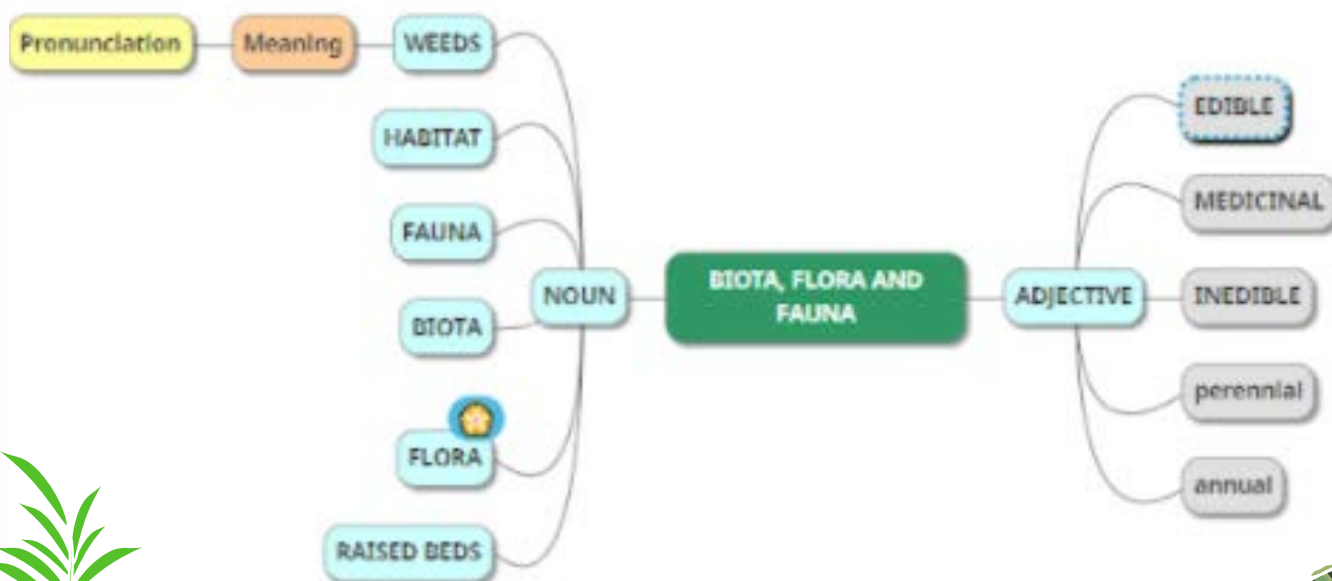
- Identify the part of speech (action/state word - verb, describing word - adjective etc.)
- In your own words define the meaning and give an example in context

VOCABULARY

biota	perennial	herbs
flora	annual	edible/inedible
fauna	raised plant beds	medicinal
habitat	weeds	pollinator

Here is a Word table and Mind Map example of how you could create your digital vocabulary guide.

WORD	PART OF SPEECH	MEANING	CONTEXT
biota	noun	The animal and plant life of a particular region, habitat, or geological period.	We still have a lot of the Earth's biota to save.



WILD IRISH EDIBLE FLORA WORKSHEET

NB: You should only harvest and consume plants if you are 100% certain that it is okay to do so.

Ireland has an array of delightful edibles.

1. Look at the following images of Irish edibles and match them to what you think they could be used to make.

SALADS	SOUPS	PESTOS	COFFEE/TEA
 Dandelions	 Sea Spaghetti	 Stinging Nettles	
 Curly Dock Leaves	 Wild garlic	 Hawthorn Leaves/Flowers	
 Wood Sorrell	 Bramble Leaf	 Wild Mint	

2. Now access the following Website and check your ideas. Were you correct?

<https://www.wildernessireland.com/blog/wild-foraging-ireland/>

3. Paired Discussion:

- What did you learn that was interesting or surprising?
- Which would you like to try?
- Have you tried any of these before?
- How do you think you could use these ingredients to make a new drink or snack?
- Would any of these edibles work well in ice cream? What kind of flavours would they add?





WILD IRISH EDIBLE FLORA WORKSHEET: ANSWER SHEET

Salads

Dandelions
Fresh Hawthorn Leaves and flowers
Wild garlic
Curly Dock Leaves

Soups

Wild Garlic
Stinging nettles
Sea spaghetti

Pestos

(base of greens or leaves, some kind of nut (pine nuts, walnuts, almonds, whatever you like), and olive oil. Cheese is optional but generally preferred.)

Wood Sorrell
Wild Garlic

Tea/Coffee

Wild Mint
Stinging Nettles
Bramble leaf tea
Roasted Dandelion Root

Encourage learners to make / taste an edible recipe from the list ensuring that the core ingredient is the correct species.



SDG15 Seeding Sustainability

MM3: Examining Edible / Medicinal Plants



MM3: Examining Edible / Medicinal Plants

Research and Development

Lesson 2: Webquest - Habitats, Flora and Species

Subjects: English, Geography, Home Economics, Irish, Science, SHPE

Lesson Title and Summary: Webquest - Habitats, Flora And Species

Ireland hosts a range of habitats, from blanket bogs to wetland systems, rivers and estuaries, native woodland and marine. Over 100 habitat types have been classified in Ireland, boasting a rich array of flora and fauna. This lesson asks learners to use independent and collaborative research skills to discover information about habitats in Ireland and the different types of flora and fauna that can be found in each.

Vocabulary: Biota, Coastal habitat, Directory, Edible, Flora, Fauna, Habitat, Medicinal, Open Water Habitat

In this lesson, the learner will:

- develop recording, analysis and evaluation skills
- conduct research into habitats of Ireland
- practice note taking and recording information
- reconnect with food, nature and community
- identify local edible flora

Materials

- Worksheet: Habitats, Flora and Species Web Quest
- Supporting Skills Worksheet: C.R.A.A.P Test
- Notes and worksheets from Lesson 1
- Internet Access



MM3: Examining Edible / Medicinal Plants

L2: Webquest - Habitats, Flora and Species



ACTIVITY INSTRUCTIONS

In order for learners to show evidence of evaluating their sources, it is advisable that they complete the SDG 4 Support Skills: C.R.A.A.P Test before doing this lesson. This worksheet can be set as a flipped classroom task, or used as the basis of its own lesson.

Activity 1 Habitats, Flora and Species webquest (50 mins)

- 1) Direct learners to the Habitats, Flora and Species worksheet. Go through the instructions and check understanding.

- 2) Instruct learners to work in pairs to complete the tasks on the worksheet. They can use the worksheets from Lesson 1 to support their research. Give 30-35 minutes. The information they are to find out is as follows:
 1. What are the 2 major habitats of Ireland?
 2. Identify one edible flora from each major habitat.
 3. What is an “open water” habitat?
 - a. What does it include?
 - b. What species of flora is found here that is edible?
 4. What is a “coastal” habitat?
 - a. What does it include?
 - b. What species of flora is found here that is edible?

- 3) Assign pairs into small groups of 6 (3 x pairs per group). Each pair has time to present their findings.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks.
- Two things they found most interesting and would like to explore more.
- One – their opinion they have about the tasks.

Use Post-its or a mentimeter survey - www.mentimeter.com - to gather reflections

MM3: Examining Edible / Medicinal Plants

L2: Webquest - Habitats, Flora and Species



EXTENSION / REDUCTION ACTIVITIES:

Reduction (40 min lesson): For a shorter lesson, spend less time on the share and compare findings in Step 3.

Extension (80 min lesson): For a longer lesson, spend more time guiding learners through evaluating online sources. Learners could upload findings to a whole class, shared document to begin the initial pages of a directory.

Flipped Classroom or standalone lesson for evaluating sources use supporting skills: C.R.A.A.P. test worksheet

- Evaluating Sources C.R.A.A.P <https://researchguides.ben.edu/source-evaluation>
- Youtube directions for evaluating sources (2:16 mins) <https://youtu.be/EyMT08mD7Ds>

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Grow it Yourself 'Veg Directory' <https://giy.ie/get-growing/veg-directory/>

Habitats <https://www.wildlifetrusts.org/habitats>

Coastal habitats

<https://www.wildlifetrusts.org/habitats/coastal#:~:text=Coastal%20habitats%20are%20found%20wherever%20the%20land%20meets%20the%20sea.&text=The%20coast%20is%20home%20to,%2C%20mudflats%2C%20saltmarshes%20and%20machair.>

Coral habitat <https://www.irishtimes.com/news/ireland/irish-news/irish-scientists-discover-new-coral-habitat-off-kerry-coast-1.2260381>

LOCAL TRIP / EXPERTISE / ADDITIONAL WORK AND ASSESSMENTS

- Visit the local library to search existing for examples of directories.
- Interview staff at a garden centre.
- Ask / interview grandparents for local edible / medicinals



WEBQUEST

ANSWER SHEET

1. What are the 2 examples of major habitats of Ireland? Grassland, Heath, Bog
2. Identify one edible flora from each major habitat.
 - Learners' own answers - must provide proof of research that plant is edible
3. What is an “open water” habitat?
 - What does it include? “Open water” habitat rivers, canals, lakes, reservoirs, ponds and, uniquely, turloughs
 - What species of flora is found here that is edible? Students own answers - must provide proof of research that plant is edible
4. What is a “coastal” habitat?
 - What does it include? “Coastal” muddy shores, rocky shores, sandy shores, shingle beaches, brackish water bodies, saltmarsh, maritime flushes and streams, sea cliffs and sand dunes and machair
 - What species of flora is found here that is edible? Learners' own answers - must provide proof of research that plant is edible





WEBQUEST

You are going to conduct some investigation and research. You will do this in pairs. You will use the internet and/or library to source information and you must show evidence of evaluating your sources (C.R.A.A.P. Test).

STEP 1

There are 5 questions to research. BEFORE you begin, read through the questions and highlight the key words in each. These are the words you will use to help narrow down your search for information.

1. What are the 2 examples of major habitats of Ireland?
2. Identify one edible flora from each major habitat.
3. What is an “open water” habitat?
 - a. What does it include?
 - b. What species of flora is found here?
 - c. Which species found here are edible?(If any)
4. What is a “coastal” habitat?
 - a. What does it include?
 - b. What species of flora is found here?
 - c. Which species found here are edible?(If any)
5. Draw or make a list to show where these habitats are in your local area/county/country.

STEP 2

Organise your notes into a short presentation of your findings. Remember to show evidence of your CRAAP Test in the sources you referenced.

STEP 3

Present your findings to a small group. Compare your information and add to your notes if there are any interesting or relevant points from other group members.



SDG15 Seeding Sustainability

MM3: Examining Edible / Medicinal Plants



MM3: Examining Edible / Medicinal Plants

Research and Development

Lesson 3: Local Flora/Fauna Scavenger Hunt

Subjects: English, Geography, Home Economics, Irish, Science, SHPE

Lesson Title and Summary: Local Flora/ Fauna Scavenger Hunt

Flora and fauna is linked with the air we breathe and the food we eat and are interdependent. This lesson connects learners with their local, natural place as they are tasked with identification, information-gathering and evaluation of local flora and fauna.

Vocabulary: Annual, Biota, Edible, Flora, Fauna, Inedible, Medicinal, Perennial, Pollinators

In this lesson, the learner will:

- explore and find different flowers/plants (flora) of varying colours
- observe and note what insects/birds and other wildlife (fauna) are attracted to the variety of flowers/plants
- develop recording, analysis and evaluation skills
- explore and discover local flora
- investigate and observe the patterns of colour of flora
- investigate and observe the attraction of colour to fauna
- reconnect with food, nature and community
- explore the local environment, connections between flora colour and fauna

Materials

- Worksheet: Local Flora/ Fauna Scavenger Hunt
- Optional Extra Worksheet: Web Quest 1
- Worksheet: Wild Irish Edibles (Lesson 1)
- Materials for recording: pens, notebooks, digital devices



MM3: Examining Edible / Medicinal Plants

L3: Local Flora/Fauna Scavenger Hunt



ACTIVITY INSTRUCTIONS

Activity 1 Local flora and fauna scavenger hunt (50 mins)

This is an outdoor class activity. Follow usual safety procedures for outdoor lessons. Learners will explore and find different flowers/plants (flora) of varying colours. Learners will observe and note what insects/birds and other wildlife (fauna) is attracted to the variety of flowers/plants.

1. Direct learners to the Local Flora and Fauna Scavenger Hunt worksheet. Go through instructions and check understanding. Instruct learners that they will walk around the outdoor areas of the school or the local neighbourhood in pairs (this could be a plotted area, park or garden) to make observations and note findings. Following this, they will share and discuss their findings with their peers. (10 mins)
2. Divide learners into pairs for the scavenger hunt. Confirm the time they have and location for return meet up. (30 mins)
3. Join pairs to make groups of 4. Give groups 2 mins per rotation to discuss and share their findings. Rotate groups until all groups have met and compared findings. (10 mins)

Alternative: Complete a scavenger hunt online, using the Optional Extra Worksheet: Web Quest 1.

Teacher's Reference:

FLORA VERSUS FAUNA	
Flora refers to the plant life that can be found in a specific area or time.	Fauna refers to the animal life that can be found in a specific area or time.
Flora remains in one place.	Fauna can move from one place to another.
Flora can typically prepare their own food.	Fauna depends on flora for food.
Flora is studied in botany.	Fauna is studied in zoology.
Pediaa.com	

MM3: Examining Edible / Medicinal Plants

L3: Local Flora/Fauna Scavenger Hunt



REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks.
- Two things they found most interesting and would like to explore more.
- One – their opinion they have about the tasks.

Use Post-its or a mentimeter survey - www.mentimeter.com - to gather reflections

EXTENSION / REDUCTION ACTIVITIES:

Reduction (40 min lesson): For a shorter lesson, skip the group share and discussion.

Extension (80 min lesson): For a longer lesson, spend more time on the scavenger hunt and on the group sharing and discussion phase.

Optional Extras: Link to Scavenger Hunt

- learners can try to find samples/take photos of pictured edible flowers on the worksheets in the local area.
- learners can discuss possible tastes and gastronomy uses of the flowers.
- learners can look up the information on tastes and uses via a web quest

Also ask learners to watch one of the videos e.g. 'New to Foraging' or 'Foraging for Beginners'

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

'New to Foraging - 5 Plants for Absolute Beginners (13:37 min) <https://youtu.be/VdgP8ui9gr4>

'Foraging For Beginners' (18:35 min) <https://www.youtube.com/watch?v=g9Ey7POtEeY>

Article: Edible Flowers <https://www.ruralsprout.com/edible-flowers/>

Foraging <https://www.wildernessireland.com/blog/wild-foraging-ireland/>

Irish Herbs, Plant medicines (14:00 min) <https://www.youtube.com/watch?v=cLfcvi2i3x4>

Irish Fauna <https://www.museum.ie/en-IE/Museums/Natural-History/Exhibitions/Irish-Fauna>

LOCAL TRIP / EXPERTISE / ADDITIONAL WORK AND ASSESSMENTS

Visit a local herb garden/ park to complete the scavenger hunt.

Invite a local botanist, ecologist or interested citizen scientists to take part in the scavenger hunt.



SCAVENGER HUNT

Colours are very important in the natural world. They attract different living creatures for different reasons.

Walk around the assigned area and see what you can find.

- Can you find different examples of flowers/plants (FLORA) with the following colours? (see example below)
- Take a photograph and/or make a sketch of what you find.
- Note shapes, size and scents.
- Observe what insects/birds and other wildlife (FAUNA) is attracted to them.



A white flower
Often attractive to beetles, moths, butterflies and flies



A pink flower
Often attractive to butterflies and moths



A red flower
Often attractive to birds



An orange flower
Often attractive to birds and some butterflies



A yellow flower
Often attractive to bees, butterflies, hoverflies and wasps



A blue flower
Often attractive to bees



A purple flower
Often attractive to bees, wasps and butterflies



A green flower
Thought to be the first flower colour



A multicoloured flower

Image for this [Flower Scavenger Hunt](#) from Chelsea Physic Garden, 2020

As part of the scavenger hunt, try to find 3 of the edibles you matched on the **WILD IRISH EDIBLE FLORA WORKSHEET**.

- What did you find?
- Where did you find them?
- What did you observe?
- Would any of them work as an ice-cream ingredient? Why/why not?



MM3 L3 WS: LOCAL FLORA & FAUNA

15 LIFE ON LAND



Optional Extra Worksheet: Edible Flora (Web Quest 1)

Can you find these flowers online and gather some information about their edible / medicinal uses?



Top row - left to right: Apple blossom, Borage, Dianthus, Chives, Cornflower.

Bottom row - left to right: Courgette, Dill, Forget-me-not, Lavender, Marigold



Top row - left to right: Bergamot, Nasturtium, Nigella, Oregano, Pansy

Bottom row - left to right: Roses, Sage, Strawberry, Sunflower, Tulip



Use the Chelsea Physic Garden plant collection website to find their scientific names <https://cpg.gardenexplorer.org/>

Discussion: What do you think they taste like? How do you think they could be used for eating and drinking?



After your discussion visit this website and compare your ideas from the discussion to the information on the site. You can also use this information to help create the directory.

SDG3 Eco-Agency: Supporting Youth-Led Climate Action



Standalone TY Unit

Lesson 12 Introduction to Youth Movement and the European Nature Restoration Law

Subject Areas:
Climate Action and
Sustainable Development,
CSPE, SPHE



Lesson Title and Summary:

Introduction to Youth Movement and the European Nature Restoration Law

The influence young people have on impacting global change is significant. Their collective passion, purpose and resilience has resulted in notable change. In this lesson learners are introduced to the Youth Movement around the European Nature Restoration Law.

The European Nature Restoration Law marked a vital stride in promoting health and planetary conservation. Learners will delve into the law's details, its roles in health and conservation, and its connections to the UN Sustainable Development Goals and Earth Charter.

Vocabulary:

Influence, Law, Mind Map, Nature, Restoration, Youth Movement, Global Citizenship

In this lesson, the learner will:

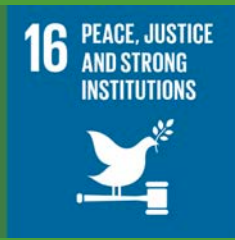
- Be introduced to Youth Movement and the European Nature Restoration Law
- Explore the importance of nature restoration and how young can impact positive action
- Practice Mind mapping as a strategy for brainstorming

Materials

- Worksheet: Introduction to Youth movement for the European Nature Restoration Law, Mind Mapping
- Teacher's Notes: Meditation Script, Introduction to Youth movement for the European Nature Restoration Law, Discussion Cards
- A3 Paper per group
- Coloured Pens
- Bluetack

SDG3 Eco-Agency: Supporting Youth-Led Climate Action

L12 Youth Movement and the European Nature Restoration Law



ACTIVITY INSTRUCTIONS

Activity 1 Meditation (5 mins)

1. Lead a 3-minute guided breathing exercise to help students centre their focus. See Supporting Resource: Meditation Script 5
2. Ensure learners are in a comfortable position before starting and use a calm and soft voice.

Activity 2 Nature Restoration Discussion (30 mins)

1. Invite learners to form groups of 3 or 4.
2. Write 'Why are young people important?' on the board. Elicit ideas from the whole class and encourage them to take notes.
3. Distribute discussion cards or project them on a screen. Go through questions going over any new vocabulary and checking learner understanding.
4. Explain to learners that they are to discuss and note ideas in form of a mind map. Elicit learners' understanding of a mind map. (See Teacher's Notes for supporting information).
5. Ask learners to discuss questions in groups allowing time for each question to be discussed and ideas to be notes in a mind map.
5. Circulate to monitor progress.

Activity 3 Share and Compare (15 mins)

1. Ask groups to display their mind maps around the room.
2. Invite learners to circulate and review the maps of their peers.
3. Encourage and instruct them to note one thing similar and one thing different about the maps of other groups compared to their own groups display.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

You can use post-its or a mentimeter poll www.mentimeter.com to gather the reflections

SDG3 Eco-Agency: Supporting Youth-Led Climate Action

L12 Youth Movement and the European Nature Restoration Law



REDUCTION / EXTENSION ACTIVITIES

Reduction: For a shorter lesson, reduce the discussion on the Nature Restoration Law and leave Activity 3 for another class.

Extension: For a longer lesson, allow 40 minutes for discussion and 10 minutes for mind map reviews.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Factsheet Publication:

Directorate-General for Environment (European Commission) (1970) Nature restoration law, Publications Office of the EU. Available at: <https://op.europa.eu/en/publication-detail/-/publication/a0e3cfac-f600-11ec-b976-01aa75ed71a1/language-en>

Article:

Morton, A. (2021) Australian court finds government has duty to protect young people from climate crisis, The Guardian. Available at: <https://www.theguardian.com/australia-news/2021/may/27/australian-court-finds-government-has-duty-to-protect-young-people-from-climate-crisis>

Press Release:

Questions and Answers on Nature Restoration Law: restoring ecosystems for people, climate and planet' (2022a) European Commission [Preprint]. European Commission. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_3747

LOCAL TRIP / EXPERTISE / ADDITIONAL WORK AND ASSESSMENTS

Direct learners to read about the role of youth in influencing changes to legislation in Australia.

Ask them to then review the UN Sustainable Goals 3, 13, and the Earth Charter pillar 1.4.

Instruct them to summarise their understanding of the role of youth and their alignment with the goals and pillar and how this all relates to global citizenship.



Meditation Script 5

- Ensure learners are sitting somewhere comfortable.
- Use a calm and soothing voice as you read.

3-Minute Guided Meditation

This meditation is a simple yet effective practice that can be done in just a few minutes, making it easy to incorporate into your daily routine to promote well-being and mental clarity. The combination of physical movements, deep breathing, and positive affirmations help reduce stress and cultivate a positive mindset.

1. **Shoulder Rolls:** Begin with a few seconds of shoulder rolls, which helps open the heart chakra and release tension in the upper body. Roll your shoulders three times back and then reverse for three forward rolls.
2. **Close Your Eyes:** If your eyes weren't already closed, close them to create a serene and focused environment.
3. **Deep Breathing:** Inhale for three seconds, hold for three seconds, and exhale for three seconds. Pay close attention to the sensation of air entering through your nose and filling your lungs. This deep breathing promotes relaxation and mindfulness.
4. **Body Scan:** As you continue to breathe deeply, mentally scan your body from your toenails to the top of your head. If you encounter tension in any area, consciously release it. This helps you become more aware of your body and any stress it may be holding.
5. **Heart Chakra and Positive Energy:** Bring your palms together in front of your heart and continue to breathe deeply. Ask for positive energy to enter your heart chakra and feel the loving vibes surrounding you. This can help you feel more positive and connected.
6. **Affirmations:** Inhale while thinking "I am enough," and exhale while thinking "I am amazing." Repeat this affirmation several times. This reinforces positive self-belief and self-worth.
7. **Lower Your Hands:** After the affirmations, lower your hands into your lap.
8. **Closing:** Acknowledge that your three-minute meditation is almost over. Take one final deep inhale and exhale.
9. **Gratitude:** Give thanks to the Universe and your higher self for the positive energy and self-affirmation. Express gratitude for taking this time for your mental health.
10. **Open Your Eyes:** Finally, open your eyes and transition back to your day with a more relaxed and positive mindset.





Activity 2 Discussion Card Questions and Answers

Why are young people important?

- Answers will vary

What do you know about the European Nature Restoration Law?

- Answers will vary.

What is nature restoration and why do we need it?

- Restoration is a process to support the recovery of degraded, damaged or destroyed ecosystems and bring more nature and biodiversity back everywhere, from agricultural and forest land to marine environment and urban spaces.

How serious do you think the problem of ecosystem degradation is and why should we urgently act?

1. 81% of EU-protected habitats were in poor condition, with 36% deteriorating and only 9% improving;
2. All European ecosystems – from natural, semi-natural to heavily modified – are under increasing pressure and suffer from the exacerbating impacts of climate change and other threats such as nutrient pollution due to overuse of fertilizers and chemical inputs. Intensifying land use and conversion of land are causing the loss of ecosystems.
3. In the wider Western, Central and Eastern European region, wetlands have shrunk by 50% since 1970. 84% of peatlands – key for capturing and storing carbon and filtering water – are in unfavourable conservation status. In the past decade, 71% of fish and 60% of amphibian populations have suffered a decline;
4. The general condition of EU forests is classified as poor, and ecosystems with intensive agricultural activities are among the most threatened;
5. Marine ecosystems face acute challenges from the climate crisis, biodiversity depletion, overexploitation, pollution, and destruction by invasive species.
6. What might be the economic costs and benefits of the Nature Restoration law?
 - example, the benefits for health, economic resilience, recreation of restoring peatlands, marshlands, forests, heathland and scrub, grasslands, rivers, lakes and coastal wetlands are estimated to be more than €1 800 billion, with costs of around €150 billion.



Activity 2 Discussion Card Questions and Answers Continued

What role did young people play in the passing of the law?

1. Advocacy and Activism:
2. Social Media and Online Activism:
3. Youth Organizations:
4. Representation in Decision-Making Bodies:
5. Lobbying and Meeting with Lawmakers:
6. Art and Culture:
7. Education and Information Dissemination:
8. Voting and Political Engagement:

Litigation and Legal Action: Ecocide lawsuit Australia

How does it make you feel knowing that young people have the power to make such meaningful change?

- Answers will vary

How might this law align or link to the Sustainable Development Goals and the Earth Charter. Refer to Sustainable Development Goals(SGD) 10,13,16,17 and Earth Charter Principles 1, 2, 3, 4

- Answers will vary.
- See link in Media Box for Un Sustainable development Goals Website for further information
- See link in Media Box for Earth Charter for further information.

What else would you like to know about this and how might you find out?

- Answers will vary

DISCUSSION: ECO ANXIETY



Why are young people important?

DISCUSSION: ECO ANXIETY



What is nature restoration and why do we need it?

DISCUSSION: ECO ANXIETY



What might be are the economic costs and benefits of the Nature Restoration law?

DISCUSSION: ECO ANXIETY



What role did young people play in the passing of the law?

DISCUSSION: ECO ANXIETY



How might this law align or link to the Sustainable Development Goals and the Earth Charter.

DISCUSSION: ECO ANXIETY



What do you know about the European Nature Restoration Law?

DISCUSSION: ECO ANXIETY



How serious do you think the problem of ecosystem degradation is and why should we urgently act?

DISCUSSION: ECO ANXIETY



How might this law align or link to the Sustainable Development Goals and the Earth Charter.

DISCUSSION: ECO ANXIETY



How does it make you feel knowing that young people have the power to make such meaningful change?

DISCUSSION: ECO ANXIETY



What else would you like to know about this and how might you find out?



Mind Map Information

1. Choose the topic of the mind map and place it in the middle of the drawing
2. Come up with three to five main ideas, then evenly space them in a circular formation around the mind map topic
3. Draw a line from the mind map topic to each main idea
4. Brainstorm supporting details such as ideas, tasks, and questions for each main idea
5. Draw lines connecting each main idea to its supporting details.

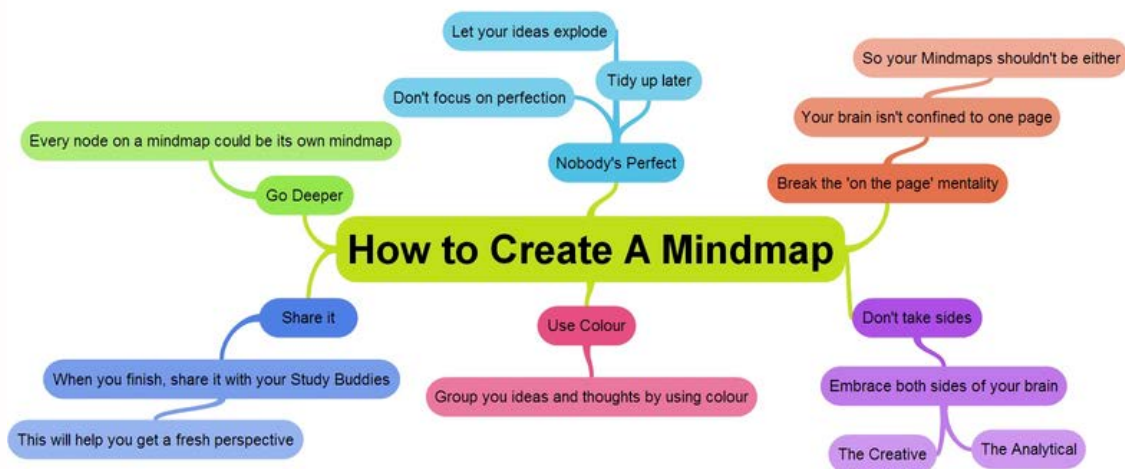


Image Credit : <https://www.software4students.co.uk/goconqr/mind-maps/>

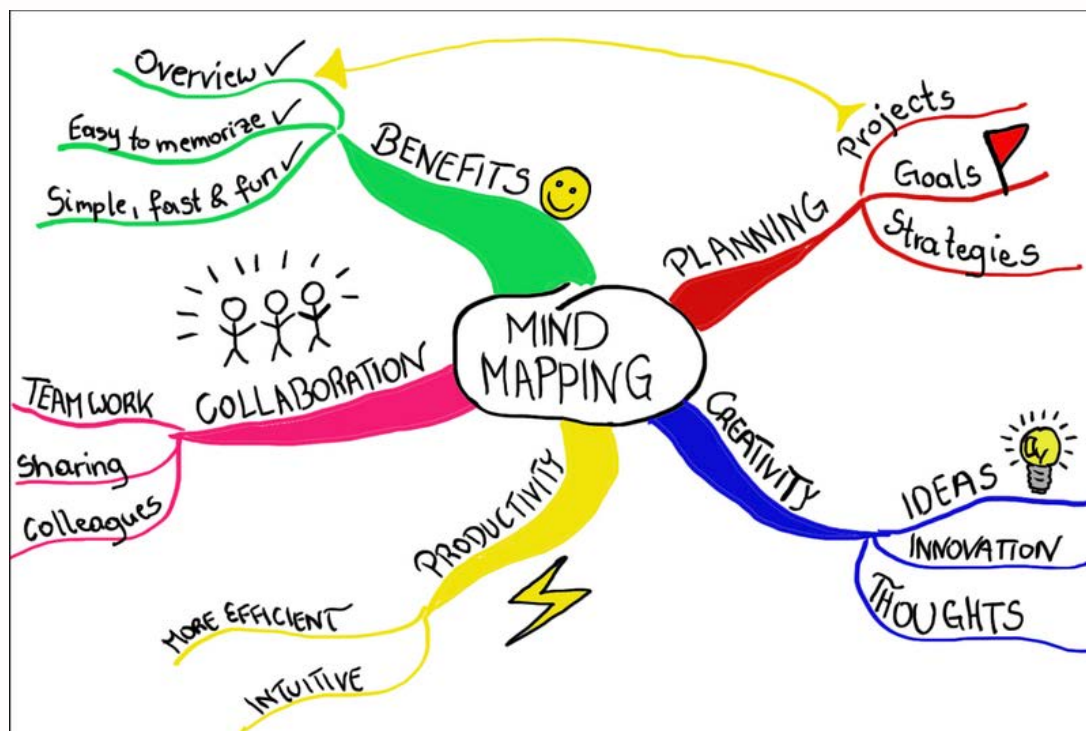


Image credit: Mindmeister.com

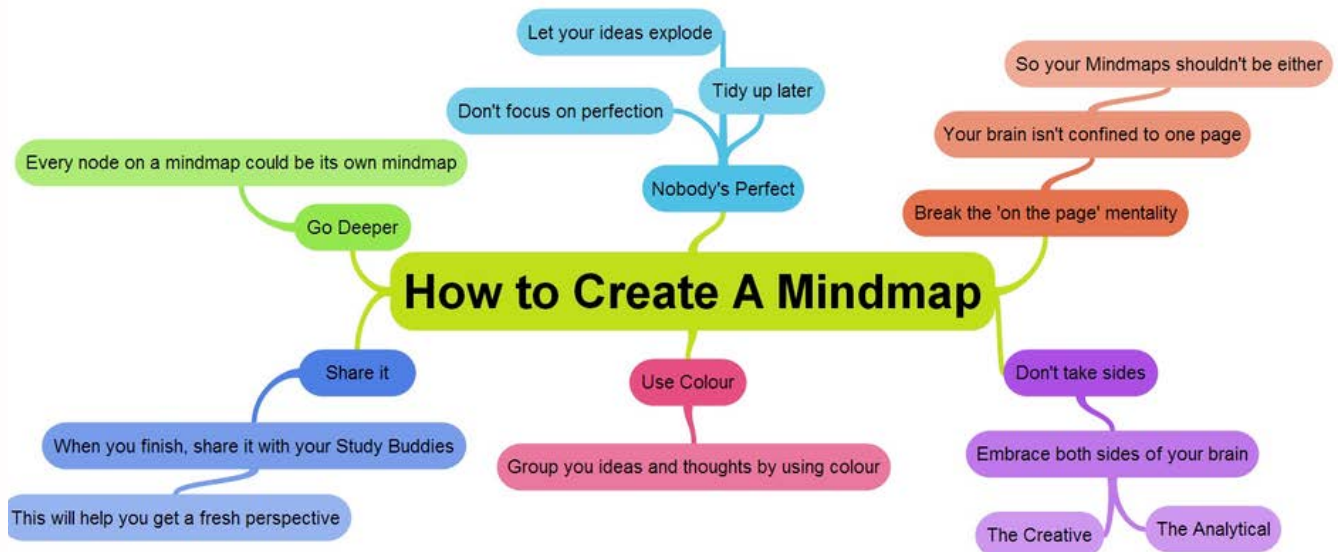


Image Credit : <https://www.software4students.co.uk/goconqr/mind-maps/>

Activity 2 Mind Map Information

1. Choose the topic of the mind map and place it in the middle of the drawing
2. Come up with three to five main ideas, then evenly space them in a circular formation around the mind map topic
3. Draw a line from the mind map topic to each main idea
4. Brainstorm supporting details such as ideas, tasks, and questions for each main idea
5. Draw lines connecting each main idea to its supporting details.

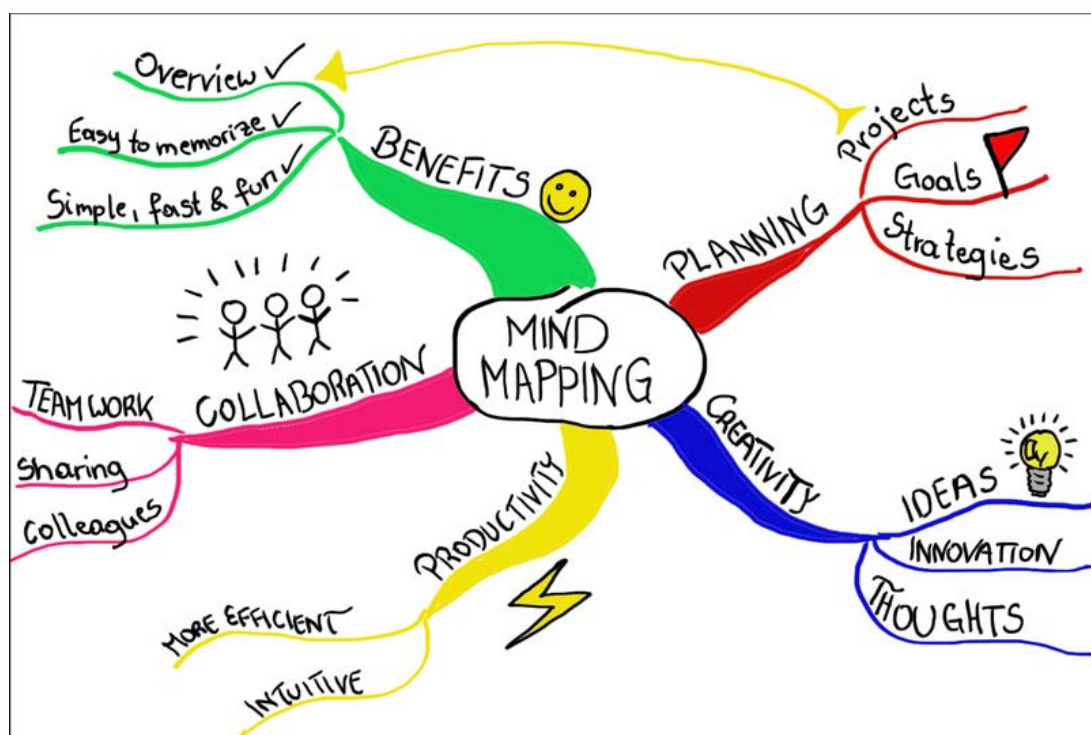


Image Credit: Mindmeister.com

SDG3 Eco-Agency: Supporting Youth-Led Climate Action



Standalone TY Unit

Lesson 13 The European Nature Restoration Law

Subject Areas:
Climate Action and
Sustainable Development,
CSPE, SPHE

10 REDUCED
INEQUALITIES



13 CLIMATE
ACTION



16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



Lesson Title and Summary:

The European Nature Restoration Law

The passing of the European Nature Restoration Law was a significant step towards supporting health and planetary conservation for future generations. In this lesson learners will learn more about the law, how it supports health and planetary conservation and explore it's links to the UN Sustainable Development Goals and the Earth Charter.

Vocabulary:

Benefits, Biodiversity, Ecosystem, Food sovereignty, Law, Nature, Restoration, Sustainability,

In this lesson, the learner will:

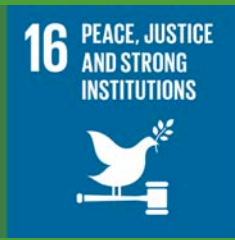
- Gain deeper understanding of what is the European Nature Restoration Law
- Explore how young people helped in passing the European Nature Restoration Law,
- Explore how it will support planetary conservation and health.
- Present Groups learning to another group

Materials

- Worksheet: Law for Nature Instructions including Goals and Pillars
- Teacher's notes The European Nature Restoration Law: Planetary conservation and health, Information Cards 1 & 2

SDG3 Eco-Agency: Supporting Youth-Led Climate Action

L13 The European Nature Restoration Law



ACTIVITY INSTRUCTIONS

Activity 1 The European Nature Restoration Law (10 mins)

1. Invite learners to sit comfortably and ask them to listen and follow the instructions. Play the Video: The 5-4-3-2-1 Method: A Grounding Exercise to Manage Anxiety (see Media Box) but audio only. Play from beginning to 2:51 mins.
2. Briefly review what they learned in Lesson 11. Allow learners to shout out responses. Write some on the board.
3. Project the "benefits" image in the Teacher's Notes and remind learners of the benefits of nature restoration.

Activity 2: Read all about it (20 mins)

1. Ask learners to form groups of 3 and to nominate a group leader, a speaker and a note taker. Explain the roles to the learners and advise that all group members are responsible for time keeping. See Teacher's Notes for role information.
2. Direct groups to their Worksheet: Law for Nature and go through the task instructions. Check understanding and clarify where needed.
3. Distribute reading materials: (ideally digitally via a shared drive or print out reading packs for each group) Reading pack includes: Goals and Pillars - 1 page, Project Cards 1 and 2 and distribute Factsheet - 2 pages (See Media box) 4.
4. Explain that learners need to collaborate to distribute reading materials equally and to take no longer than 10 minutes on reading their allocated information.

Activity 3 What have we learned? (20 mins)

1. After reading, learners must discuss learnings from the text they read and complete steps three and four of their worksheet.
2. Remind learners to manage their time and be respectful of others.

REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Use post-its or a mentimeter poll www.mentimeter.com to gather reflections

SDG3 Eco-Agency: Supporting Youth-Led Climate Action

L13 The European Nature Restoration Law



REDUCTION / EXTENSION ACTIVITIES

Reduction: For a shorter class, do only activity 1 and 2

Extension: For a longer class, pair groups together to form larger groups and allow the speaker of each to present the group's findings to another group. While listening other group members prepare follow up questions to ask the presenting group as a whole.

MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Video: Nature Restoration Law, Climate activist Greta Thunberg protests with Fridays for future [1:06 min] <https://www.youtube.com/watch?v=wo--rt095DA>

Article: Six Portuguese youth take 32 nations to European court over climate change <https://www.aljazeera.com/features/2023/9/21/six-portuguese-youth-take-32-nations-to-european-court-over-climate-change>

Video: The 5-4-3-2-1 Method: A Grounding Exercise to Manage Anxiety (2021a) https://youtu.be/30VMIEmA114?si=Rs_STEayYI4yMK5h [4:28min]

Factsheet Publication: Directorate-General for Environment (European Commission) (1970) Nature restoration law, Publications Office of the EU. Available at: <https://op.europa.eu/en/publication-detail/-/publication/a0e3cfac-f600-11ec-b976-01aa75ed71a1/language-en>

Press Release: Questions and Answers on Nature Restoration Law: restoring ecosystems for people, climate and planet' (2022a) European Commission [Preprint]. European Commission. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_3747

LOCAL TRIP / EXPERTISE / ADDITIONAL WORK AND ASSESSMENTS

Have learners create their own social media video, individually or in pairs, promoting the European Nature Restoration Law. The video should:

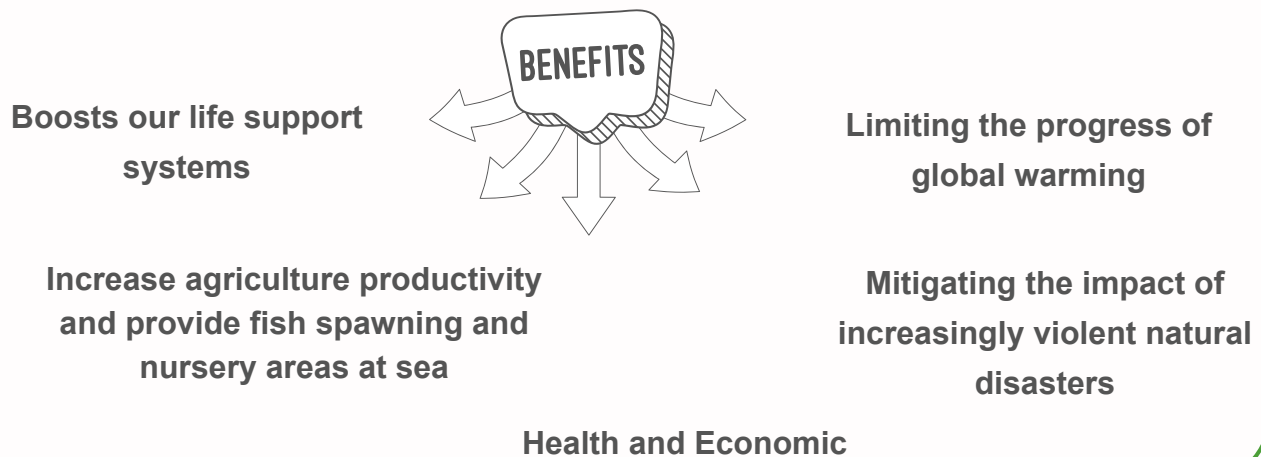
- summarise the benefits of such a law
- how this law aligns with the SDGs and The Earth Charter
- identify how they will take action to support efforts relating to the law

Use Media Communications MC`1 - Video Module to support learners with this project.



Lead in. This can be written up on the board or projected.

What is nature restoration and why do we need it?



Activity 2 Group Roles:

- A Leader - responsible for organising the group and the distribution of tasks, which is to include themselves, completion of allocated reading and discussion tasks and responsible for the final review of all tasks.
- A Speaker / Summariser- responsible for completing allocated reading and discussion tasks and presenting the group's work to others.
- A Note Taker - responsible for completing allocated reading and discussion tasks and noting key information from the group's discussion and collaboration in order to prepare the talking points for the speaker.

Card 1

What is The 2030 EU Biodiversity Strategy?

"The 2030 EU Biodiversity Strategy is a far-reaching plan aimed at safeguarding nature and counteracting the decline of ecosystems in Europe. This strategy strives to restore the continent's biodiversity by 2030 through targeted measures and commitments. Notably, it constitutes the EU's proposal for the global post-2020 biodiversity framework negotiations and is intricately linked to the European Green Deal. Furthermore, it serves as a means to promote environmental recuperation after the Covid-19 pandemic. In connection to the EU Nature Restoration Law, this strategy aligns with the law's objectives by outlining specific actions to revitalise nature and halt its degradation."

Source: European Commission

How might this strategy and the Nature Restoration Law support health and planetary conservation?



European Nature Restoration Law Information Card 2

Restore Ecosystems:

It establishes a framework for reviving degraded ecosystems (wetlands, forests, grasslands), vital for biodiversity, climate regulation, water filtration, and species support.

Enhance Biodiversity:

This law safeguards and rejuvenates habitats crucial for various species, ensuring ecosystem stability and species survival.

Combat Climate Change:

Restored ecosystems act as carbon sinks, reducing greenhouse gases, amplifying global efforts against climate change.

Manage Water:

Revived wetlands and forests regulate water cycles, prevent flooding, and purify water sources, improving water quality and management.

Promote Health:

Healthy ecosystems boost human well-being via green spaces, clean air, and water, supporting mental and physical health.

Planetary Conservation:

The Earth is a complex interconnected system where all life forms are interdependent. Protecting and restoring nature is crucial not only for individual species but also for the overall health of the planet. A law focused on nature restoration aligns with broader conservation efforts to preserve Earth's ecosystems for future generations.



Goals and Pillars



Pillar 1.4

Respect and Care for the Community of Life: Secure Earth's bounty and beauty for present and future generations.



Pillar 2.6

Ecological Integrity: Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.



Pillar 4.13 Democracy, Non - violence and Peace

Transparency and Participation: Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice.



Pillar 4.14 Democracy, Non - violence and Peace

Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.



Pillar 4.16 Democracy, Non - violence and Peace

Promote a culture of tolerance, nonviolence, and peace



Activity 2 Law for Nature: Instructions

Step 1: Form groups of 3.



1. A Leader - responsible for organising the group and the distribution of tasks include self and final review of all tasks.
2. A Speaker/ Summariser - responsible for completing allocated tasks and summarising the group's work.
3. A Note Taker - responsible for noting key information from the group's collaboration and preparing them for the speaker.

Step 2: Distribute the information for reading so each member has something to read but is not the same for all. Reading materials include:

1. Factsheet page 1 & 2 digital or handout
2. Information card 1 & 2 handout
3. Goals & Pillars handout

Example:

- one person read Factsheet page 1
- another reads page 2
- the third reads the information cards



Step 3: After reading, share what you understood from your text with each other and take notes from each sharing. Use the note page to collate the groups notes and link what you have learned to how this law aligns with the Un Sustainable Development Goals and the Earth Charter Pillars.

Step 4 Together create construct a concise summary for the speaker to share with the class and share your summary with the class as directed.

Extension Class only:

Step 5: Join another group and take turns to share your groups summary. Listeners to ask at least one follow up question.



Planetary conservation and health

Goals and Pillars



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