

Teachers' notes

Ecosystems

Suggested activities

Learning outcomes

By the end of the unit students should be able to:

- identify different ecosystems in Northern Ireland
- understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water
- identify different elements in ecosystems
- differentiate between one ecosystem and another
- recognise that ecosystems operate on a range of scales.

Students will develop an understanding of issues relating to Ecosystems in Northern Ireland - ie:

- realise that different ecosystems have been adversely affected by human activity [*Key Elements: Education for Sustainable Development, Personal Health, Economic Awareness, Cultural Understanding*]
- recognise that introducing different elements into ecosystems may affect that ecosystem and neighbouring ecosystems [*Key Elements: Education for Sustainable Development, Personal Health*]
- understand how the global climate changes are affecting the ecosystems within Northern Ireland [*Key Elements: Education for Sustainable Development*]
- appreciate that ecosystems must be sensitively managed in order to protect them [*Key Elements: Education for Sustainable Development, Personal Health, Cultural Understanding*]

Section/resource	Learning outcome	Activities to achieve learning outcome
Clip 1: Breen Wood	<ul style="list-style-type: none"> • Identify different ecosystems in Northern Ireland • Understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water • Differentiate between one ecosystem and another • Recognise that ecosystems operate on a range of scales • Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> • Discuss - What is an ecosystem? • Queens Research Centre for Biodiversity and Conservation Biology http://www.quercus.ac.uk has a wealth of information on local species and ecosystems • What is a deciduous forest? • What is the difference between deciduous and coniferous forests? What makes this forest so special? • Watch the clip. Then ask the class to identify the key elements of the deciduous wood ecosystem. • Locate the wood on an OS map • Draw a food chain for the forest • Draw a nutrient cycle for the forest <p>Related Resources:</p> <ul style="list-style-type: none"> • <i>News clip: Landfill pollution</i> • <i>News clip: Climate changes</i> • The MET office provides climate information for students to research and document http://www.metoffice.gov.uk/

<p>Clip 2: Rathlin Island</p>	<ul style="list-style-type: none"> Identify different ecosystems in Northern Ireland Understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water Identify different elements in ecosystems Differentiate between one ecosystem and another Recognise that ecosystems operate on a range of scales Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> Use an OS map to show the location of Rathlin Island - allow small groups of students to use the map to measure how far it is from the North Antrim coast On a map of Rathlin Island, highlight the sites of the different ecosystems featured in the clips. Identify possible threats to each of the ecosystems and devise methods of protection Draw a food chain featuring the seabirds on the island <p>Related resources:</p> <ul style="list-style-type: none"> News clip: Fish quotas News clip: Wind farms News clip: Coastal responsibility News clip: Climate changes Google Earth
<p>Clip 3: Lough Neagh</p>	<ul style="list-style-type: none"> Identify different ecosystems in Northern Ireland Identify different elements in ecosystems Differentiate between one ecosystem and another Appreciate that ecosystems must be sensitively managed in order to protect them Realise that different ecosystems have been adversely affected by human activity 	<ul style="list-style-type: none"> Locate the lough on a map of the UK and compare its size to that of other lakes and loughs Discuss the sources of problems which Lough Neagh faces Identify the biggest threats to the Lough Neagh ecosystems. List the animals that live in and around the lough and identify how each of the threats would affect each animal Describe one reason why Lough Neagh should be protected Ask the pupils to work in groups to devise some methods of protecting the lough <p>Related resources:</p> <ul style="list-style-type: none"> Mountains, lakes and rivers: Lough Neagh & Lough Erne clips Economic Activity and Land Use: Rural Land Use clip News clip: Fish farming News clip: Slurry pollution News clip: Zebra mussels News clip: Lough Neagh Pollution
<p>Clip 4: Cuilcagh Mountain</p>	<ul style="list-style-type: none"> Identify different ecosystems in Northern Ireland Understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water Identify different elements in ecosystems Differentiate between one ecosystem and another Appreciate that ecosystems must be sensitively managed in order to protect them Realise that different ecosystems have been adversely affected by human activity 	<ul style="list-style-type: none"> Peat is extracted for use as a fuel and for gardening. Ask the students to find out more about peat-free alternatives Run some practical tests, planting seeds in peat-based and peat-free compost to see if there is any difference in growth. Record growth rates and plot on a graph <p>Related resources:</p> <ul style="list-style-type: none"> News clip: Cuilcagh Mountain Park News clip: Ballynahone Bog 1, 2

<p>Clip 5: Strangford Lough</p>	<ul style="list-style-type: none"> Identify different ecosystems in Northern Ireland Understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water Identify different elements in ecosystems Differentiate between one ecosystem and another Recognise that ecosystems operate on a range of scales Appreciate that ecosystems must be sensitively managed in order to protect them Realise that different ecosystems have been adversely affected by human activity 	<ul style="list-style-type: none"> Describe the main land uses of the lough and surrounding land Identify possible land uses that might conflict with the ecosystems of the lough. Ask pupils to come up with a management strategy for the lough - present in a brief power-point. Then compare that to the EHSNI strategy <p>Related resources:</p> <ul style="list-style-type: none"> News clip: Fish farming News clip: Tidal power in Strangford Lough News clip: Slurry pollution News clip: Fish quotas
<p>Quiz</p>	<ul style="list-style-type: none"> Revise all ecosystem learning outcomes 	<ul style="list-style-type: none"> To be completed at the end of section to recap or to identify gaps in learning
<p>News clip: Fish quotas</p>	<ul style="list-style-type: none"> How the global climate changes are affecting the ecosystems within Northern Ireland 	<ul style="list-style-type: none"> Discuss the effect of the reduction of fish levels on the ecosystems of Rathlin Island, Lough Neagh and Strangford Lough
<p>News clip: Cuilcagh Mountain Park</p>	<ul style="list-style-type: none"> Realise that different ecosystems have been adversely affected by human activity Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> Discuss all the benefits of protecting the bogland. Would there be a negative impact on any groups of people?
<p>News clip: Ballynahone Bog 1, 2</p>	<ul style="list-style-type: none"> Realise that different ecosystems have been adversely affected by human activity Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> There were a number of interested parties protesting for and against peat extraction. Divide the class into groups to represent all the interested parties: Bulrush Peat Company, local residents, environmentalists, local workforce. Debate 'Should the bogland be used for peat extraction?'
<p>News clip: Fish farming</p>	<ul style="list-style-type: none"> Realise that different ecosystems have been adversely affected by human activity Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> List all the causes of water pollution. What can be done to reduce the levels of water pollution?
<p>News clip: Lough Neagh pollution / Slurry pollution</p>	<ul style="list-style-type: none"> Realise that different ecosystems have been adversely affected by human activity Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> Pollution from farming and septic tanks is an acknowledged threat to the Lough Neagh ecosystem. Research ways of reducing the pollution. Then conduct a debate on how to implement these measures. Divide the class into groups, each acting as one of the interested parties in the issue: local residents, fishermen, farmers and Friends of the Earth
<p>News clip: Zebra mussels</p>	<ul style="list-style-type: none"> Recognise that introducing different elements into ecosystems may affect that ecosystem and neighbouring ecosystems 	<ul style="list-style-type: none"> Zebra mussels are an introduced species that are detrimental to local marine ecosystems. Research the threat that other introduced species (grey squirrel, New Zealand flatworm and mink) may pose to the ecosystems of Breen Wood, Lough Neagh, Strangford Lough, Cuilcagh Mountain

<p>News clip: Climate changes</p>	<ul style="list-style-type: none"> • Understand that ecosystems are a result of the interaction between climate, animals, rocks, soil and water • How the global climate changes are affecting the ecosystems within Northern Ireland 	<ul style="list-style-type: none"> • Discuss how climate change will affect each of the five ecosystems • The Meteorological Office's website provides extra information on global warming http://www.metoffice.gov.uk
<p>News clip: Wind farms</p>	<ul style="list-style-type: none"> • Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> • Wind farms are an example of renewable energy. Conduct a debate for and against building a wind farm on a hill near the school
<p>News clip: Coastal responsibility</p>	<ul style="list-style-type: none"> • Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> • Discuss the possible impact to Rathlin Island's ecosystems if there are different bodies responsible for different parts of the coastline- ie what would happen if there was an oil spill?
<p>News clip: Tidal power</p>	<ul style="list-style-type: none"> • Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> • Tidal power is a form of renewable energy which is good for the environment but what of the impact on the local area? Divide the class into groups to debate the pros and cons of building a tidal power plant in Strangford Lough
<p>News clips: Landfill pollution, Slurry pollution</p>	<ul style="list-style-type: none"> • Realise that different ecosystems have been adversely affected by human activity • Appreciate that ecosystems must be sensitively managed in order to protect them 	<ul style="list-style-type: none"> • Landfill & slurry pollution pose a threat to the delicate balance of many ecosystems. Using the internet (start with BBC news website) research incidents of pollution that have affected the waterways of Northern Ireland • Locate these rivers on a map. How did the pollution affect the local ecosystems? How could the pollution have been prevented?
<p>News Clip: Wind power</p>	<ul style="list-style-type: none"> • Realise that Ireland is an island surrounded by water • Understand how people interact with the coast • Understand that coastal landscapes need to be carefully managed in order to protect them for future generations 	<ul style="list-style-type: none"> • Wind energy is a form of renewable energy. Debate the positive and negative outcomes of building a wind farm off Portrush