# BE THE WAVE
# AR FRIG Y DON

# Threats to the Ocean

Lesson Plan

| Aims |
|---|
| • Understand the various threats to the ocean's ecosystems and how these could be reduced through ecosystem-based management and marine protected areas. |

| Objectives |
|---|
| • Explain the key threats to the ocean and how these have environmental, economic and social consequences. <br> • Identify how stakeholders can work collaboratively to achieve ecosystem-based management. <br> • Construct arguments for and against marine protected areas in the ocean through the views of a key stakeholder. |

| Eco-schools topic | Global Goals |
|---|---|
| • Biodiversity <br> • Global Citizenship <br> • Litter | • 14 – Life Below Water |

| Links to the Curriculum for Wales | |
|---|---|
| **Purpose** | |
| Ambitious, capable learners who: <br> • Are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts <br> • Can communicate effectively in different forms and settings <br> Ethical, informed citizens who: <br> • Find, evaluate and use evidence forming views <br> • Engage with contemporary issues based on their knowledge and values <br> • Understand and consider the impact of their actions when making choices and actions <br> • Respect the rights and needs of others, as a member of a diverse society <br> • Show commitment to the sustainability of the planet. <br> Enterprising, creative contributors who: <br> • Think creatively to reframe and solve problems | |
| What Matters Descriptions of Learning | Progression Step: Four |
| Humanities <br> • Express, discuss and justify personal opinions <br> • Understand the range of factors that affect the interrelationships between humans and physical processes <br> • Explain how significant places, environments and landforms in the natural world are associated with economic, historical, political, religious and non-religious beliefs and practices. <br> • Understanding my own and others' environmental, economic, and social responsibilities in creating a sustainable future. | |

- Make decisions, identify opportunities, and plan appropriate action to make my voice heard.
- Analyse and explain the impact of decisions made by individuals, local, national, or global governance, and non-governmental organisations on people, their rights and the environment.

Science and Technology
- Review opinions based on scientific fact
- Explain how the impact of our actions contribute to the changes in the environment and biodiversity.

| LNF | Progression Step: Four |
|---|---|

Listening
- Listen to gain different people's views and ideas on various subjects, using them to arrive at my own conclusions.
- Listen to and consider the relevance and significance of information and ideas presented to me.
- Listen to and respond to others with questions, comments and suggestions in order to develop collaborative talk and reach compromise/consensus.

Speaking
- Undertake a range of responsibilities to structure and develop group talk, including in more formal situations.
- Recognise a range of options for action and reach agreement to achieve the aims of the group.
- Sustain a convincing point of view, anticipating and responding to other perspectives.
- Respond to others' points of view with confidence and sensitivity, summarising and evaluating what I have heard, read or seen.

| Cynefin |
|---|
| Recognising Marine Protected Areas in Wales and discussions of their implementation, need and impact on a wide range of Welsh stakeholders |

| Activity One | Resources and Equipment |
|---|---|
| **What are the main threats to the ocean?**<br>To set the scene introduce the importance of the ocean by watching the 'What did the ocean ever do for us' video<br><br>Highlight some of the key threats, notes are provided for each slide to aid you. For each threat, discuss as a class how the threat will affect the ocean environmentally, as well as how communities and industries who rely on the ocean will be affected economically and socially.<br>Create a table on the whiteboard with column headings for environment, economy and society and fill this out as you work your way through the Presentation. This will help to highlight how threats to the ocean don't just harm the environment but have many knock-on effects. | Threats to the ocean Presentation |

| Activity Two | Resources and Equipment |
|---|---|
| **Ecosystem Based Management**<br><br>Show the video on ecosystem-based management to introduce the need for interconnectivity between industries, communities and the marine environment. Introduce the term **stakeholder**.<br><br>Split the class into small groups and hand each group a copy of stakeholder groups. This resource shows a selection of key stakeholders in the marine environment. Allocate a stakeholder to each group. Students should mind map:<br>    1.   How the actions of their stakeholder could affect the environment.<br>    2.   The map should then branch out. For each affect, students should consider how they could reduce risk.<br>    3.   Then for each risk, students should consider what other sectors their stakeholder could work with to share knowledge and experience and why it would make sense to work with that stakeholder.<br><br>For example, for Ministry of Defence,<br>    1.   One of the actions could be testing sonar at sea.<br>    2.   This would then branch out to the risk being noise pollution to marine animals.<br>    3.   They could suggest working with environmental charities to understand how noise pollution affects animals and the best areas of the ocean for sonar tests to cause the least harm to animals.<br><br>Once students have completed their extended mind maps, they should present their ecosystem-based management ideas to the rest of the stakeholders. Stakeholder groups can then decide whether they should work collaboratively. Keep a note of how many links between stakeholders the students come up with. | Threats to the ocean Presentation<br><br><br><br>Stakeholder groups |

| Activity Three | Resources and Equipment |
|---|---|
| **Marine Protected Areas**<br>There are several management measures which can help to protect the ocean, such a legislations and laws, restoration projects and **marine protected areas** (MPA). As a class, watch the short video introduce students to MPA in Wales.<br><br>In the same stakeholder groups as activity two, students should be presented with a scenario of the designation of an MPA in their local area of the ocean. | Threats to the ocean Presentation |

| | |
|---|---|
| Stakeholder groups should discuss reasons for or against the designation of an MPA. After a 5/10 minute group discussion, stakeholders should explain their views to the rest of the class. Other stakeholders can challenge them to create heated discussions.<br><br>This activity highlights that although MPA can have great benefits for marine biodiversity, management is a difficult balance between environmental, economic and social needs. | |

## 🌊 #BeTheWave

Apply the knowledge gathered in the lesson into action as ethical and informed citizens. It is an important aspect to ensure students know they have the power to enact and make changes within their own lives and within the school. It is also a positive step which helps to balance some of the negative impacts explored within the lesson.

 Decide on any actions to take forward either as individuals or as a class. Below are some suggestions, or the class could generate their own.

School:
- Try holding a weekly plastic free lunch at school to cut down litter that could enter the marine environment.
- Switch your school's energy supplier to a green energy company.
- Make sure any fish served in the school canteen is sustainable by using the MCSs Good Fish Guide:  www.mcsuk.org/goodfishguide/search

Individual:

- Reduce your use of single use plastic to reduce the amount of litter entering the ocean.
- Investigate if your bathroom cosmetics contain harmful PFAS chemicals which can enter the ocean via your bathroom drain.
- Try making your commute to school greener by walking, cycling or using public transport to cut down your greenhouse gas emissions.
- If you eat fish, make sure it's from a sustainable source by using the MCSs Good Fish Guide: https://www.mcsuk.org/goodfishguide/search
- When on holiday don't buy souvenir gifts that harm marine life like seahorses.

| Alternative Activities | Resources and Equipment |
|---|---|
| **Activity One – Protecting Angel Sharks** | Angel Shark Threats |

BE THE WAVE

AR FRIG Y DON

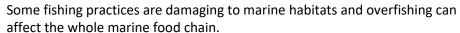| | |
|---|---|
| Angel sharks are critically endangered. Using the range decline map and threats grid in the Angel Shark Threats document, students should create a management plan to ensure better protection for angel sharks.<br><br>**Activity Two – Greater Protection for Welsh Waters**<br>Countries from around the world have signed up to committing to protect 30% of the sea by 2030 to protect and recover biodiversity. Although over 36% of the Welsh territorial sea has been designated as marine protected areas, marine wildlife is still declining and fragile habitats within these 'protected' areas are still being damaged. More effective management is urgently needed, and conservation charities are calling for stricter measures within these areas.<br><br>Students should use information provided in the 30x30 poster and the '**Marine unProtected Areas**' report to create a poster that can be used in school and shared on social media. The poster should explain why we need to protect 30% of marine habitats in Wales by 2030 and why this protection needs to include some Highly Protected Marine Areas. | 30x30 Poster<br><br>Marine unProtected Areas Report |

Stakeholder Groups

**Fishing industry**
In the fishing industry there are both local small-scale fishers with their own boats and large-scale fishers run by big business. Billions of people all over the world rely on seafood for income and food. In Wales, the fishing industry is historically, culturally and economically important.
Some fishing practices are damaging to marine habitats and overfishing can affect the whole marine food chain.

**Shipping**
Many of our commercial goods are transported around the world by the shipping industry. There are seven major ports in Wales. The 5 in South Wales employ approximately 15,000 staff. In 2015 these ports handled 54.6 million tons of cargo.
This industry is associated with causing pollution through emissions, oil spills, container spills, dumping of rubbish at sea and chemical pollution through anti fouling paint. Shipping also causes damage through anchoring, shipwrecks, noise pollution, direct contact with large marine mammals and

**Renewable Energy**
This includes energy produced though wind, waves and tides. In 2018 50% of Wales electricity consumption was met using renewable energy and the Welsh Government has set a target to increase this to 70% by 2030. Construction of wind turbines can cause noise pollution and severe damage to marine ecosystems. Once the development of the structures is complete, there is evidence that these structures provide an artificial reef for marine species to attach to, creating a new kind of habitat.

### Oil & Gas

The ocean provides us with many valuable resources, including oil and gas. In Wales, there are two important oil and gas bases at Milford Haven and Point of Ayr. Oil and gas have many uses: to produce electricity, heat homes, fuel vehicles and planes and to create products.

Drilling for oil and gas can pose serious threats to the marine environment, from the construction of platforms, transporting of goods, creation of pipelines and through extremely destructive oil spills.

### Ministry of Defence

The ministry of defence includes the navy, army and air force, all who aim to protect our country. They use the ocean as a training ground to practice exercises, including firing missiles and testing unmanned aerial vehicles.

Testing weapons causes noise pollution and directly litters the marine environment. Boats are also associated with air pollution through

### Tourism

Our beautiful coastline and beaches attract huge numbers of tourists from all over Wales and beyond. Coastal tourism contributes more than £700 million to the Welsh economy. 60% of the population of Wales live around the coast. With so many people enjoying coastal scenery and activities, healthy seas are vital for our health and wellbeing.

Activities such as boating can cause harm through oil discharge and damage to the seabed habitats through anchoring. Natural coastal habitats are being destroyed to make room for development.

### Environmental Groups

There are many different groups interested in protecting the marine environment, from marine scientists to environmental and wildlife charities.

Some groups might be particularly interested in protecting the ocean because of the environmental services habitats provide, such as, producing oxygen, storing carbon, reducing wave energy and filtering pollution from the water.

Other groups might be interested in protecting the incredible biodiversity of our Welsh waters, for example protecting bottlenose dolphins,



### Local Community

60% of the population of Wales live around the coast. 75% of people in Wales agree that the Welsh coast is an important part of their life. Within these local community there will be many different interests and concerns connected to the local coastline and ocean.

People's livelihoods may depend on the ocean, such as people working in fishing, the oil and gas industry or tourism. Local communities might support development along the coast to bring jobs and money to the local community. But other people might be against development, as they might not want the coastal to change or have environmental

cadwch keep
gymru'n wales
daclus tidy