

Marine and Coastal Wildlife Education Pack

Introduction and Teachers' Notes

Introduction

This Marine and Coastal Wildlife Education Pack has been designed to educate primary-aged children about the wildlife of our seas and coasts. It is aimed primarily at Key Stage 2 pupils, but certain elements may be suitable for a wider age range.

The pack is available to download from www.denbighshirecountryside.org.uk/activities/. It is also available in Welsh.

We are ideally placed in Denbighshire to explore the North Wales coast. The wide sandy beaches of Rhyl, Prestatyn and Gronant are ideal for strandline searches, which introduce children first-hand to the variety of life in our seas. Field trips to the beach can be complemented by classroom-based activities – with ideas for both within this pack.

Using the Pack

The pack can be used as a whole or you may select individual elements to use on their own. Note however that the Quiz is designed to test knowledge after viewing the Marine and Coastal Wildlife and Marine and Coastal Wildlife of Wales PowerPoint presentations.

The Great Eggcase Hunt and Strandline Search are activities on the beach itself and the poetry trail can be indoor or outdoor. The other activities are classroom-based. Additional background notes for the PowerPoint presentations are provided in this document along with answers for the reading comprehension.

Pack Contents

	Description
1. PowerPoint presentation: Marine and Coastal Wildlife	Introduction to marine wildlife and habitats
2. PowerPoint presentation: Marine and Coastal Wildlife of Wales	A look at the wildlife found along the coasts and in the seas of Wales
3. PowerPoint presentation: Marine and Coastal Wildlife Quiz	Test your knowledge of the previous two presentations with this interactive quiz
4. Marine Species Reading Comprehension	Profiles of four marine creatures to read, with accompanying questions
5. Marine Wildlife Poetry Trail	An indoor or outdoor activity. Use the clues in the poem to guess the marine creature
6. Marine Wildlife Word Search	Find the 16 words in the grid
7. The Great Eggcase Hunt	An activity for the beach. Search for the eggcases of sharks, skates and rays and contribute to scientific research
8. Strandline Search	Instructions to carry out your own strandline search or 'beach comb'
9. Your Strandline Search leaflet	Identification guide for common animals and plants washed up on the beach
10. Feedback form	To be completed by teacher or activity leader

Marine Species Reading Comprehension – Answers

Below are the answers for the reading comprehension exercise.

Little tern

1. Africa / West Africa
2. Camouflage / protection
3. August

Common starfish

4. Five
5. Spines
6. Smell

Bottlenose dolphin

7. Fluke
8. Milk
9. Breaching

Basking shark

10. Whale shark
11. Cartilage
12. Plankton

General questions

13. Common starfish
14. Bottlenose dolphin
15. Bottlenose dolphin

PowerPoint Presentations – Teachers' Notes

1. Marine and Coastal Wildlife – PowerPoint Presentation

This PowerPoint presentation provides an introduction to the wildlife of our seas and coasts. It takes a global perspective, looking at some of the various types of habitats within the sea, as well as the main groups of animals and plants that live there. These notes are designed to give a little more background information on the topics covered in the slides.

By the end of the presentation, children should have an appreciation of the great variety of life in our seas and on our coasts, and should be able to name some of the main marine habitats and species.

An accompanying presentation is available looking more closely at the wildlife of Welsh seas and coasts.

Slide 1

- Wildlife in our seas is fascinating and includes some of the biggest and strangest creatures on Earth – as well as some more familiar ones.

Slide 2 – Most of our planet is sea!

- 70% of the Earth's surface is water.
- Almost all of that (97%) is seawater, which is salty.
- The sea surrounding Wales is part of the Atlantic Ocean.

Slide 3 – Where do sea creatures live?

- Just like the variety of habitats on land, such as forests, grasslands and rivers, in the sea there are also lots of different habitats.
- Each habitat supports a range of species of plants and animals.
- Conditions such as water temperature, depth and ocean currents affect where each species can live. For example coral reefs are only found in warm oceans and polar bears rely on sea ice to hunt seals so only live in the cold polar north.
- The next few slides explore some key ocean habitats.

Slide 4 – Kelp forests

- Kelp is one of many types of seaweed.
- Huge underwater forest of kelp are important for locking up carbon dioxide from the atmosphere which is important in controlling climate change.
- They also provide habitats for species of animals, such as fish. The kelp forest provides them with food and shelter.

Slide 5 – Coral reefs

- Coral reefs are generally found in warm waters, above 18°C, in tropical seas (i.e. between the tropics of Cancer and Capricorn).
- They are very *biodiverse* and support thousands of different species. Coral itself is an animal.
- The biggest coral reef in the world is the Great Barrier Reef off the coast of Australia.
- The Great Barrier Reef contains 1,500 different species of fish.
- Bigger animals found in coral reefs include turtles, sharks, dolphins and whales.

Slide 6 – Open ocean

- The 'open ocean' means the vast expanses of sea found away from coastal areas.
- Some of the biggest animals live here such as whales.

Slide 7 – Deep sea

- The deep sea is unlike other marine habitats because it does not derive energy from the sun.
- It is completely dark at the bottom of the sea.
- Some animals make their own light, such as the angler fish which uses its light to hunt.
- The pressure of thousands of metres of water above means that most creatures couldn't survive here, and those that do are specially adapted.
- This deep-sea isopod (a type of crustacean) survives by feeding on dead and decaying matter which falls to the bottom of the ocean.

Slide 8 – Inter-tidal zone

- Inter-tidal means between the tides. It is the area between low and high tide.
- This is the area on the shore that is covered by the sea at high tide by exposed at low tide.
- It is the easiest place to explore marine life as it is readily accessible.
- Within the inter-tidal zone are beaches, rock pools, mudflats and other habitats.

Slide 9 – Cliffs

- Sea cliffs are important for nesting birds. As the cliffs are inaccessible the nests and young are better protected from predators.
- Some cliffs are home to huge colonies of nesting sea birds, such as South Stack on Anglesey where thousands of razorbills, guillemots and gulls nest each year.
- Seals take advantage of secluded coves between high cliffs to give birth to their young.

Slide 10 – What lives in the sea?

- The sea is full of strange creatures which often look nothing like any wildlife on land.
- The next few slides explore some of the main groups of marine wildlife (plants and animals).

Slide 11 – Plants

- Most marine plants are seaweeds. Seaweed is a kind of algae.
- The different colours of seaweed (red, green and brown) are due to the different pigments used to capture the energy from sunlight during photosynthesis.
- Since seaweeds need light to produce their own food it is advantageous to be as close to the surface of the sea as possible. Some species have air pockets (bladders) in the fronds to help them float, such as the common bladder-wrack found on UK beaches.
- Instead of roots, the seaweed anchors itself to rocks or the seabed with a 'holdfast' to stop it getting washed away.

Slide 12 – Fish

- Fish are "cold-blooded" which means they can't regulate their body temperature.
- Most species have a stream-lined body and fins for swimming.
- Fish obtain oxygen from the seawater through gills on the sides of their heads.
- Fish species range in size from less than 1cm to 16m – the biggest is the whale shark.
- There are thousands of different species of fish in the oceans.
- Many species of fish are an important food source for humans and therefore of

economic importance, e.g. cod, haddock and salmon.

Slide 13 – Mammals

- There are three groups of marine mammals.
- Whales and dolphins belong to the group all also known as cetaceans. This groups includes the large baleen whales (e.g. blue whales, humpback whales), smaller toothed whales (e.g. orcas), dolphins and porpoises.
- Seals are part of the group known as ‘pinnipeds’, which includes all seals, sea lions and walruses. Pinniped is from the Latin meaning ‘fin foot’ and refers to their flippers.
- The final group contains several species of manatee and one species of dugong. They are also known as ‘sea cows’ but are actually related to elephants.
- Like all mammals, these animals all breathe air so need to come to the surface to breathe – although many can hold their breath for many minutes to dive deep down into the sea.
- They also feed their young on milk, which is generally much thicker than for land mammals.
- They are warm-blooded and able to regulate their own body temperature.
- The blue whale is the largest animal to have ever lived – even bigger that any dinosaur.

Slide 14 – Birds

- Many seabirds spend their whole lives at sea and only come to land (sometimes only small isolated islands) to raise their young, before returning to the open ocean.
- Others remain along coasts all year and some even venture inland, such as onto farmland to feed.
- Seabirds often nest in huge colonies on cliffs. Thousands – even millions – of birds can be present in one colony.
- Albatrosses are the largest seabirds (wingspan up to 3.5m).
- Other types of seabirds are puffins, gulls, penguins, sea ducks and cormorants.

Slide 15 – Reptiles

- Like their cousins on land, marine reptiles are cold-blooded. They may gain heat energy from the water temperature or from basking in the sun, depending on the species.
- Reptiles need to come to the surface of the ocean to breathe air.
- The main groups of marine reptiles are:
 - Turtles
 - Lizards
 - Crocodiles
 - Snakes

Slide 16 – Invertebrates

- Invertebrates are animals with no backbone.
- This is a diverse group, with lots of strange creatures.
- The main groups are:
 - Molluscs – includes sea shells like cockles and mussels, octopus, squid, sea snails and sea slugs.
 - Crustaceans – includes crabs, lobsters, prawns, shrimp and barnacles.
 - Echinoderms (say: eck-**eye**-no-derms) – includes starfish, sea urchins and sea cucumbers.

- Cnidarians (say: nid-**ah**-ri-ans) – includes jellyfish, anemones and corals.
- Worms – many different types, not necessarily related. Includes segmented worms that are related to earthworms, as well as more elaborate creatures that don't actually look much like worms!
- This is just a selection of marine invertebrates – there are many more out there to investigate.

Slide 17 - Summary

- The presentation should have demonstrated that despite appearances, the sea is not all the same.
- It is full of all kinds of different forms of life.
- You have seen some of the wide variety of habitats found within the sea.
- And some of the millions of creatures that live there.
- Now take the opportunity to allow the children to spend a few minutes discussing what they have learnt from the presentation.

2. Marine and Coastal Wildlife of Wales – PowerPoint Presentation

Teacher's Notes

This PowerPoint presentation provides an introduction to the wildlife of Wales' seas and coasts. It looks at a range of creatures living in Welsh waters. These notes are designed to give a little more background information on the topics covered in the slides.

By the end of the presentation, children should have an understanding of the range of species found in Wales' seas and coasts.

An accompanying presentation is available looking more generally at marine species and habitats from a global perspective.

Slide 1

- This presentation looks at the wildlife of Wales' seas and coasts.

Slide 2 – Wales' seas

- Wales is located in the Irish Sea, which is part of the Atlantic Ocean.
- We are close to the North Wales coast.

Slide 3 – What Lives in Wales' Seas?

- The seas around Wales are rich in wildlife.
- The different habitats like sandy shores, rocky shores, cliffs and reefs support different species. Some species are specialists and only found in one type of habitat, whereas others are able to survive in a range of habitats.
- The following slides explore some of the amazing creatures found in Wales' seas.

Slide 4 – Bottlenose dolphin

- Bottlenose dolphins are large animals and grow up to 4m long – that's twice as long as an adult human!
- They are intelligent, sociable and playful mammals.
- They are found in groups of 3 to 10, rarely alone.
- The biggest population around Wales is in Cardigan Bay (200 individuals). The population is studied closely by scientists and individual dolphins can be recognised by their dorsal fins (the fin on the dolphin's back).
- Bottlenose dolphins feed on fish, shrimp and squid. They usually hunt as a group.
- They use 'echolocation' to catch their prey, which is similar to sonar. The dolphins make clicking sounds which travel through the water as waves. When the waves hit an object they bounce back like an echo, and the dolphin can interpret that information to pinpoint the location of prey.

Slide 5 – Little tern

- This small seabird is found at only one site in Wales, so we are very lucky that they come to Gronant near Prestatyn in Denbighshire to breed every year.
- The birds migrate to West Africa for the winter and return each spring.
- They come to the same spot on Gronant beach to breed each spring. It is incredible that they return every year to exactly the same place on the beach!
- They fish for sand eels in shallow coastal waters. Males present females with a gift of a

sand eel to secure a pair bond.

Slide 6 – Common mussel

- Common mussels are molluscs (like slugs and snails).
- They live in the 'inter-tidal' zone, which means the area of the beach between low tide and high tide – they are covered with water at high tide, but exposed to the air at low tide.
- When the tide is out you can find them on rocky shores – they are often found in rock pools or in bigger 'mussel beds'.
- They feed by filtering seawater and extracting tiny particles of food, such as dead organic matter or tiny organisms.
- They are farmed along parts of the Welsh coast for human food, such as around Conwy and the Menai Straits between Anglesey and mainland.

Slide 7 – Thornback ray

- This is a large flattened fish, which can grow up to 1m in length. Its name comes from the spines along its tail.
- The skeleton made from cartilage (like your nose and ears) instead of bone. It is related to sharks, which also have a cartilaginous skeleton.
- Its egg-cases are known as 'mermaids' purses'. They are brown and leathery, with prongs at each corner.
- You can find mermaids' purses washed up on beaches – look out for them particularly after storms.

Slide 8 – Cormorant

- This is a large long-necked bird.
- It is an excellent underwater swimmer.
- It hunts fish underwater by diving down from the surface of the water.
- Often seen standing with its wings held out to dry. Surprisingly its feathers aren't fully waterproof, so after going into the sea the bird needs to dry out for a while!
- Found around the Welsh coast and further inland, such as along some rivers and large lakes.

Slide 9 – Cuttlefish

- Cuttlefish aren't fish at all. They are in fact a kind of mollusc called a 'cephalopod'.
- They related to squid and octopus. They are very intelligent for invertebrates.
- When threatened they release ink into the water to confuse predators so they can escape. The ink is known as 'sepia' and was once used as a dye.
- They are active predators feeding on molluscs, young fish, and crabs.

Slide 10 – Shore crab

- Crabs are crustaceans.
- Shore crabs (as well as edible crabs) are very common on Welsh coasts, in a variety of habitats.
- You can find them in rock pools and on sandy beaches.
- The hard shell is known as a 'carapace' and protects the crab.
- The front legs have pincers which are used to catch prey, such as cracking open mussel shells, and for fighting.
- Shore crabs eat molluscs, worms and other crustaceans.

Slide 11 – Jellyfish

- There are lots of different species of jellyfish in Welsh seas, including barrel, compass and lion's mane jellyfish.
- Jellyfish are an important food source for many marine animals (including turtles).
- The tentacles are used to catch prey.
- In some species the tentacles have powerful stings. They are used to stun or kill prey.
- Jellyfish are commonly found washed up on beaches, especially after storms.

Slide 12 – Basking shark

- The basking shark is the biggest fish in Welsh seas. It's the second biggest fish in the whole world (the biggest is the whale shark).
- They grow up to 10m long.
- Despite their huge size, they eat tiny 'plankton' which they filter from the water.
- In summer they migrate through the sea around Wales, however little is known about where these creatures spend the rest of the year.
- They are usually solitary.
- They aren't dangerous to humans.

Slide 13 – Puffin

- These small seabirds have bright orange feet and colourful bills.
- In summer they breed at several locations on the Welsh coast, including parts of Anglesey (e.g. South Stack).
- They lay a single egg in a burrow. Sometimes they use old rabbit burrows and sometimes they excavate their own burrows.
- Puffins spend the winter out at sea.
- They feed on small fish, like sand eels.

Slide 14 – Harbour porpoise

- Porpoises are related to dolphins. They are smaller (around 1m long) with a rounded head.
- They are found along most of the Welsh coast.
- The best time to see them is between August and November. They are often seen alongside gannets (a large sea bird), which feed on the same food.
- They feed on fish e.g. herring and mackerel.

Slide 15 – Leatherback turtle

- This reptile is the world's largest marine turtle. They grow up to 2m long and can weigh 900kg (the same as a small car!).
- Feed mainly on jellyfish.
- Come to Welsh seas in summer looking for food – the jellyfish which are very numerous around Wales.
- They breed on tropical beaches e.g. in Caribbean, which means these animals can cross the Atlantic Ocean to reach Wales.
- They are critically endangered, which means they are threatened with extinction because of the activities of humans.

Slide 16 – Sea anemone

- Sea anemones are related to jellyfish – they are almost like upside-down jellyfish that are anchored to rocks.

- Their tentacles have stinging barbs to capture small creatures like shrimps which they eat.
- At low tide anemones look like small blobs of jelly (the tentacles are hidden).
- Look for anemones in rock pools.

Slide 17 – Grey seal

- 40% of the world's population of Atlantic grey seals can be found in the UK.
- The largest colonies on the Welsh coast are on islands off Pembrokeshire.
- The seals give birth during the autumn in isolated coves away from disturbance.
- Baby seals are called pups, have white fur and feed only on their mothers' milk for the first few weeks of life.

Slide 18 – Herring gull

- Eats almost anything!
- Can hunt for fish such as herring at sea – this is where their name comes from.
- Also find worms, crustaceans and molluscs on the shore.
- Scavenges refuse from rubbish bins and landfill sites.
- Also found inland, particularly in winter.
- Sometimes thought of as a pest in towns and cities.

Slide 19 – Common starfish

- The common starfish is a predator of molluscs, worms and other starfish.
- The underside of its arms is covered with 'suckers'. It uses its suckers to attach onto the shells of mussels and other shellfish and prize the shell apart to feed on the animal inside. The starfish's stomach can come out of its mouth to begin digestion outside of the body.
- It locates its prey using its sense of smell.
- Found around the coast of Wales, often in rock pools.

Slide 20 - Summary

- The presentation should have shown that the marine life around Wales is very varied.
- There is a huge range of creatures, from tiny mussels and anemones to huge leatherback turtles and basking sharks!
- If time ask the children the following:
 - **Have you seen any of these animals before?**
 - **Can you think of any other creatures not mentioned?**

Further Information and Contacts

The following websites are useful sources of information:

Denbighshire Countryside Service	www.denbighshirecountryside.org.uk
Marine Conservation Society	www.mcsuk.org/
Sea Watch Foundation	www.seawatchfoundation.org.uk/
Shark Trust	www.sharktrust.org/
Wales Environment Link - Marine	waleslinkmarine.org.uk/
Wildlife Trusts Wales – Living Seas	www.wtwales.org/living-seas

You may also contact Denbighshire's Biodiversity Officer by phone or email:

Lizzy Webster	01824 708263
	elizabeth.webster@denbighshire.gov.uk