

Subject links:

Science, Art

Age: 5-7

Curriculum links:

UK wildlife, Biodiversity, Habitats, Ecosystems, Outdoor learning, Environment

Ocean Literacy Principles:

5. The ocean supports a great diversity of life and ecosystems

Learning Objectives:

- To explore rockpools as an environment
- To learn how animals are adapted to their habitat
- To group animals by comparing and contrasting physical features

Resources provided:

- [Rockpooling Guide \(video\)](#)
- [Rockpool image reel](#)
- [Rockpool Fact File](#)
- [Rockpool spotter sheet \(laminated to make it waterproof\)](#)
- [Seashore code](#)
- [What's the difference? worksheet](#)
- [Curriculum links](#)

Extra resources required:

Buckets, clear jars or trays (recycled plastic takeaway/butter tubs)

Rockpool explorer (Outside)

Sustainability Goals:



Step 1

Background

Rockpools are mini ecosystems. For a few hours each day they're cut off from the sea, providing a safe haven for wildlife while the tide is out. Every rock, crevice and clump of seaweed is important to the anemones, crabs, shrimps and small fish living there. The continuously-changing conditions caused by the tides make rockpools a challenging place to live, but animals living there have developed fascinating adaptations to survive. Exploring rockpools and their wildlife is an educational and exciting experience for young children. This session includes a trip rockpooling - if you can't access the beach, use the [Rockpool explorer \(inside\)](#) lesson.

Step 2

Set the Scene

In the classroom

15 minutes – Introducing rockpools

Start by asking students if anyone has been or heard of rockpooling. Children should share ideas about what's involved, why people go rockpooling and the kinds of creatures that live in rockpools. Explain that in the classroom you will be exploring rockpools as a habitat, working towards a class trip to the coast to go rockpooling together. Define the word 'habitat' and watch the [rockpooling guide](#) to set the scene.

Step 3

Activities

In the classroom

Activity 1: 15 minutes – What's it like in a rockpool?

Examine images of rockpools (not the creatures) in the [Rockpool image reel](#) and explain that rockpools are difficult places to live. Split the class into small groups and write the words, sun, rain, people, waves, tides, shelter and space on the board. Assign a word to each group and ask children to discuss ideas of how their word would affect the conditions in a rockpool and make it a challenging place to live. For example, the sun increases water temperature in the pools, which can make them hotter and cause the water to evaporate. Discuss ideas and answers as a class – use information provided in the [Rockpool Fact File](#) to support the discussion.

Activity 2: 10 minutes – Rockpool creatures

Examine the creatures on the rockpool [spotter sheet](#), which you'll use when you go rockpooling to help you identify animals and other wildlife. Use the [image reel](#) to introduce a few of the key creatures and share fun facts about them. Try to match the creatures in the image reel to the images on the spotter sheet.

Step 3

Activities

Rockpooling session

Activity 3: 10 minutes – Trip preparation

As a class, brainstorm items you could take rockpooling. Examine and discuss the [Seashore Code](#), which includes health and safety tips. Be sure to check tide times and set clear expectations. Look at images of rockpools in the [image reel](#) and discuss where you might find certain creatures and where they could be hiding (e.g. under rocks, under seaweed, in cracks, in the pools).

Activity 4: 1-2 hours – Exploring Rockpools

Head to the beach! Don't forget your rockpooling equipment and the [Rockpool spotter sheet](#) to identify the creatures you find. *Top tip* - laminate the spotter sheet to make them waterproof. Have fun!

In the classroom

Activity 5: 30 minutes – My favourite rockpool creature

Students should choose a favourite animal from the rockpool trip to draw. They should write the animal's name at the top, what they like about it and where in the rockpools it was found, annotating the drawing with physical characteristics.

Step 4

Extend

15 minutes – Creature features

Use the [What's the difference? sheet](#) to compare and contrast characteristics of animals, comparing two animals at a time. Go through an example as a class before students have a go independently. For example, limpets and crabs both have hard shells, but crabs have lots of legs and limpets don't. Use the [spotter sheet](#) as a reminder of which animals live in rockpools.

Step 5

Reflect

5 minutes

What is a habitat? Can you describe what a rockpool looks like? Why are rockpools challenging places to live? Can you name some rockpool creatures?

Step 6

Follow up

To learn more shared characteristics of animals complete the [Grouping animals](#) lesson. To explore environmental conditions and creatures of another habitat, take a look at our [Life in the deep](#) lesson.

Rockpool Fact File

Rockpools are found across the UK. They are fascinating habitats and provide a home to a diverse range of plants and animals that have adapted to live in this harsh, ever-changing environment.

Harsh conditions



Changing tides – The area is covered with water twice a day at high tide and drained of water twice a day at low tide. Only the pools retain water. When there is no water, this leads to two main problems:



Drying out – Lack of water can cause animals to dry out especially on hot or windy days.



Lack of oxygen – Some animals, like fish, need to be in the water to breathe. Other creatures, like crabs, can breathe both in and out of the water.



Waves – Rockpools are often found on exposed coastlines and animals have to be able to withstand strong waves.



Sunlight – As the rockpools are shallow, on strong sunny days the sun can heat the water in the pools and evaporate some of the water. This can lead to increased salinity in the pools.



Rain – Rainwater can reduce the salinity of saltwater in the pools.



People – When people walk along the coast and through the pools they can accidentally stand on creatures. People can also harm creatures when picking up and returning them when rockpooling.



Competition – The competition is high in rockpools due to creatures fighting for space during low tide. This is bad news for creatures ending up in the same pools as their predator.

Rockpool Fact File

Why are rockpools great to live in?

The rocky substrate provides a hard surface for seaweeds to attach. These seaweeds provide shelter and food for many other species. The cracks and crevices in the rocks and under boulders provide shelter for animals.



Rockpools
© MCS/Rachel Wyatt

Adaptations

Animals living in rockpools have to be well adapted to cope with the harsh ever-changing environment and high competition for space.



© Matt Barnes

Anemones have tentacles which they use to catch tiny food particles and plankton floating in the water. When the tide is out they curl up into a ball shape to avoid drying out and conserve energy.



© Richard Harrington

Limpets have many adaptation features. They have a strong foot gluing them to the rocks, which helps protect them from waves, and a hard shell to protect from predators. They are able to store water under their shells to be able to breath out of water and avoid drying out at low tide.

Rockpool Fact File

Adaptations



© Richard Harrington

Crabs have a hard shell which helps protect them from predators and strong waves. Their sharp claws are used for feeding and fighting off predators or competition.



© Richard Harrington

Barnacles are attached to the rocks with their heads, and once attached they can't move. Along with their hard outer shell, this protects them from waves. They have a door-like structure which is closed at low tide and open during high tide. When covered by water, they eat with their feet.



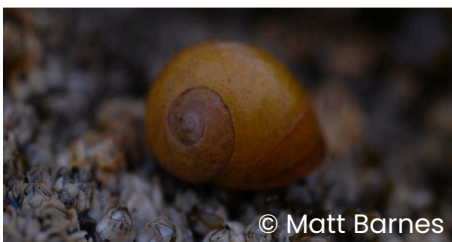
© Matt Barnes

Sea scorpions have a sharp spine to deter predators and competition.



© Peter Bardsley

Blennies have slime-covered skin to help them slide between rocks and to help them stop drying out if temporarily caught out of water.



© Matt Barnes

Sea snails are very varied and different sea snails are adapted to different parts of the rocky shore, this reduces competition for food.

Rockpool Fact File

Zones

Rocky shores can be split into different zones depending on exposure to water. This determines the diversity of species in each zone.



Subtidal zone is the area covered by water at all times and not affected by the tides.



The lower shore is normally always underwater but exposed during large Spring tides.



The middle shore is uncovered by the tide twice a day. It experiences the most wave action so animals here need to be hardy.



The upper shore is above the high tide mark because this area only gets covered with water on really high tides. There are fewer species found here.



The splash zone is at the very top of the shore and is influenced by salt spray.

**Subtidal
zone**

**Lower
Zone**

**Middle
Shore**

**Upper
Shore**

**Splash
Zone**



Rockpool Fact File

Grouping animals

Animals are grouped according to their physical and behavioural characteristics.



Fish

Are cold blooded aquatic vertebrates which use gills to breathe.



Echinoderm

Their name comes from the Greek for spiny skin. They have radial symmetry. Starfish, sea urchins and sea cucumbers are all echinoderms.



Crustaceans

Are a type of arthropod. The most famous crustacean on land is the woodlouse. In the ocean, common well known crustaceans include crabs, barnacles, and lobsters.



Molluscs

Are soft bodied, un-segmented animals with a large muscular foot, including, snails, slugs, shellfish and octopuses.



Cnidaria

Their distinguishing feature is their cnidocytes (stinging cells), which are used predominantly for capturing prey. Examples of cnidaria include jellyfish and anemones



Sea squirts

Also called ascidians, belong to the subphylum Tunicate. They are predominantly fixed to a substrate and can live individually or in colonies. Their common name comes from their ability to eject water from a siphon when touched.



Sponges

Belong to the phylum Porifera, meaning pore bearer, as their bodies are full of pores which circulate water through them.

The animals in the rockpool spotter guide can be grouped into the following groups:

Fish - Tompot blenny, sea scorpion, pipefish

Echinoderm - Cushion starfish

Crustaceans - Prawn, Shore Crab, Velvet swimming crab, Hermit crab, Barnacles

Mollusc - Grey top shell, Common periwinkle, Common limpet, Dog whelk

Cnidarian - Beadlet anemone

Sea squirt - Star ascidian

Sponge - Breadcrumb sponge

Rockpool Spotter Sheet

Name: _____



Barnacles



Common limpet



Painted top shell



Toothed top shell



Common starfish



Cushion star



Beadlet anemone



Snakelocks anemone



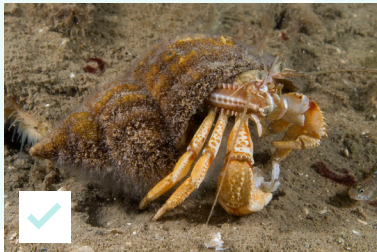
Velvet swimming crab



Montagu's crab



Common shore crab



Hermit crab



Shanny



Pipefish



Prawn



Explore responsibly

- Leave animals where you find them.
- Carefully lift and replace any rocks you move and leave attached seaweed in place. If you want to take a couple of seashells home only take the empty shells (like limpets and mussels) and leave shells that could provide a home for hermit crabs (like whelks and periwinkles).



Keep it tidy

- Take your rubbish home – don't bury it or burn it.
- Poop scoop your dog's waste then bin it responsibly.



Watch with care

- Watch quietly from a distance, especially near birds and seals with pups.
- Control your dog and keep it on a lead near birds and seals.



Mind your step

- Keep to established paths and dune boardwalks.
- If you dig holes in the beach, please fill them up again.
- Don't climb up or go near the top or bottom of a cliff.
- Check tide times to avoid being cut off.
- Keep away from soft sand and mud, and beware of slippery rocks.



Have fun!



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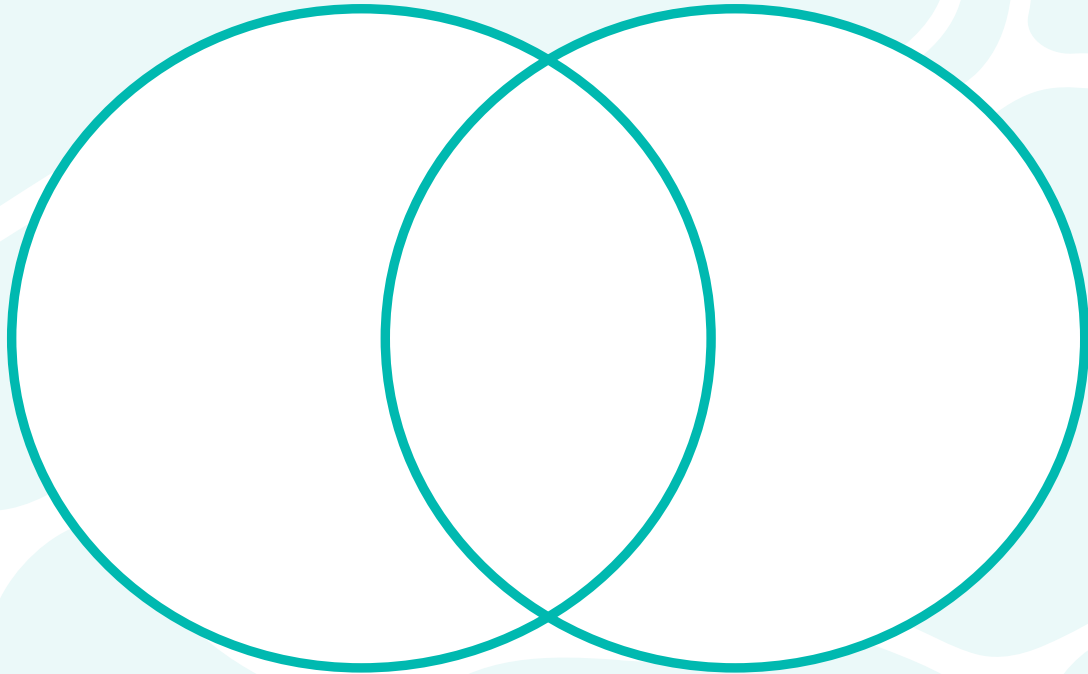
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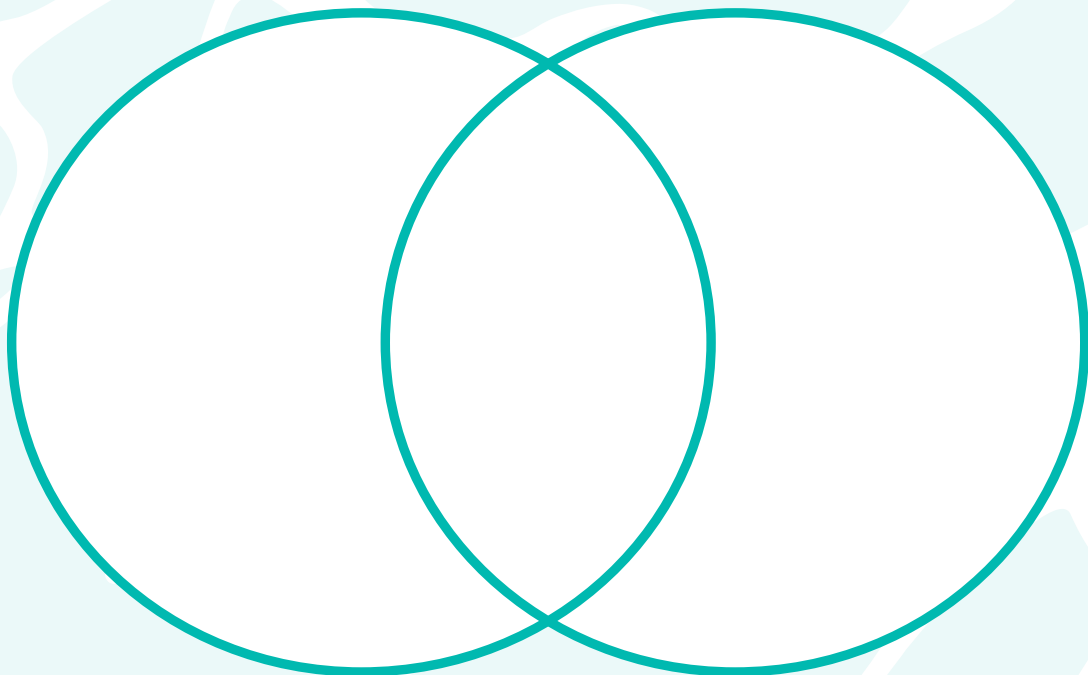
What's the difference?

Name:



Creature 1

Creature 2



Creature 1

Creature 2

Curriculum links

England

Science

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Identify and name a variety of plants and animals in their habitats, including micro-habitats

Art

- To use drawing, painting and sculpture to develop and share their ideas, experiences and imagination.

Wales

Science

- I can recognise that plants and animals are living things which grow.
- I can explore relationships between living things, their habitats and their life cycles.
- I can explore the environment, make observations and communicate my ideas.

Expressive Art

- I am beginning to design my own creative work.

Scotland

Sciences

- I explore and discover the interesting features of my local environment to develop an awareness of the world around me.
- I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.
- By exploring a natural environment different from my own, I can discover how the physical features influence the variety of living things
- I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.

Expressive Art

- I can create and present work using the visual elements of line, shape, form, colour, tone, pattern and texture.
- I can create a range of visual information through observing and recording from my experiences across the curriculum.