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Rockpool Explorer – Outside

Sustainability Goals:



Subject links:
Science, Citizenship, Art

Ages 7-11

Curriculum links:
UK wildlife, Biodiversity, Adaptations, Habitats, Ecosystems, Outdoor learning, Environment, Creativity

Ocean Literacy Principles:
5. The ocean supports a great diversity of life and ecosystems

Learning Objectives:

- To be able to identify animals found in UK rockpools
- To learn how animals are adapted to their habitat
- To group animals by comparing and contrasting physical features

Resources provided:
[Rockpool Fact File](#)
[Rockpool Video](#)
[Rockpool Image Reel](#)
[What's the Difference? worksheet](#)
[Seashore Code](#)
[Rockpool Spotter Sheet \(laminate to make it waterproof\)](#)

Extra resources required:
Buckets, clear jars or trays (e.g. recycled plastic takeaway/butter tubs)

Step 1

Background

Rockpools are mini ecosystems. For a few hours each day they are cut off from the sea, providing a safe haven for creatures while the tide is out. Every rock, crevice and clump of seaweed is important to the anemones, crabs, shrimps and small fish who live there. The continuously changing conditions caused by the tides make rockpools a difficult place to live, but animals living there have developed fascinating adaptations. Exploring rockpools and the wildlife within is both an educational and enjoyable experience for young children.

This session includes a trip rockpooling. If you can't access the beach, use the lesson, *Rockpool Explorer – Inside*.

Step 2

Set the Scene

In the classroom

15 minutes – Introducing rockpools

Ask if anyone has been or heard of rockpooling. Children should share ideas of what's involved, why people go rockpooling and what creatures 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 *rockpool film* to set the scene.

Step 3

Activities

In the classroom

Activity 1: 20 minutes – Environmental conditions

Examine images of rockpools (not creatures) in the *rockpool image reel*. Explain that rockpools are difficult places to live. Write the words sun, rain, people, waves, tides, shelter and space on the board. In small groups, students should discuss and brainstorm how each element would affect the conditions in a rockpool, making it a hard place to live. For example, the sun increases temperature in the pools and can evaporate water. Discuss answers. You can find more information in the *fact file*.

Activity 2: 5-10 minutes – Rockpool zones

Use the *image reel* to show images of rockpool zones. In the same groups, children should consider how the elements discussed in Activity 1 will affect the conditions differently in each zone. Discuss ideas (use the *fact file* to help you guide discussions). Define the term 'adaptation.' Explain that animals in each zone need to adapt to these conditions. Explain that some animals are adapted to only live in one zone, whereas other animals have adapted to live across all zones.

Activity 3: 10 minutes – Adaptations

In pairs, examine and discuss the creatures on the *rockpool spotter sheet*. For each creature, think about its physical characteristics. Consider how it has adapted to live in rockpools and which zone it might live in. For example, limpets

have hard shells and a strong sucker underneath to hold themselves to rocks and protect them against waves. Discuss ideas as a class and show species images in the *image reel*.

Activity 4: 15 minutes – What's the difference?

Return to pairs. Use the *what's the difference?* sheet to compare and contrast characteristics of two animals. Pairs will then use this exercise and information learnt in Activity 3 to try grouping some of the species together based on their physical characteristics. For example, fish and shellfish. Discuss thoughts and reveal the groupings (answers in *fact file*).

Rockpooling session

Activity 5: 10 minutes – Rockpool prep

As a class, brainstorm items you could take rockpooling. Examine and discuss the *seashore code*. 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 creatures, thinking about where they could be hiding (e.g. under rocks, under seaweed, in cracks).

Activity 6: 1- 2 hours – Exploring rockpools

Head to the beach! Don't forget your rockpool equipment and *rockpool spotter sheet* to identify creatures found. Top tip – laminate these guides to make them waterproof. **Have fun!**

Step 4

Extend

Back in the classroom

30 minutes – Animal Annotation

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. Annotate the drawing with physical characteristics and adaptation features.

Step 5

Reflect

5 minutes

Why are rockpools challenging places to live? Can you name some rockpool creatures? Give an example of how an animal has adapted to live in rockpools.

Step 6

Follow up

To learn more about adaptation, complete the lesson, [*How do creatures adapt?*](#) To learn more about grouping animals, complete our [*Grouping animals*](#) 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.



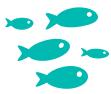
Sunlight – As the rockpools are shallow, on strong sunny days the sun can heat the water in the pools and evaporate some of the water. This can lead to increased salinity in the pools.



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
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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 Portifera, 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

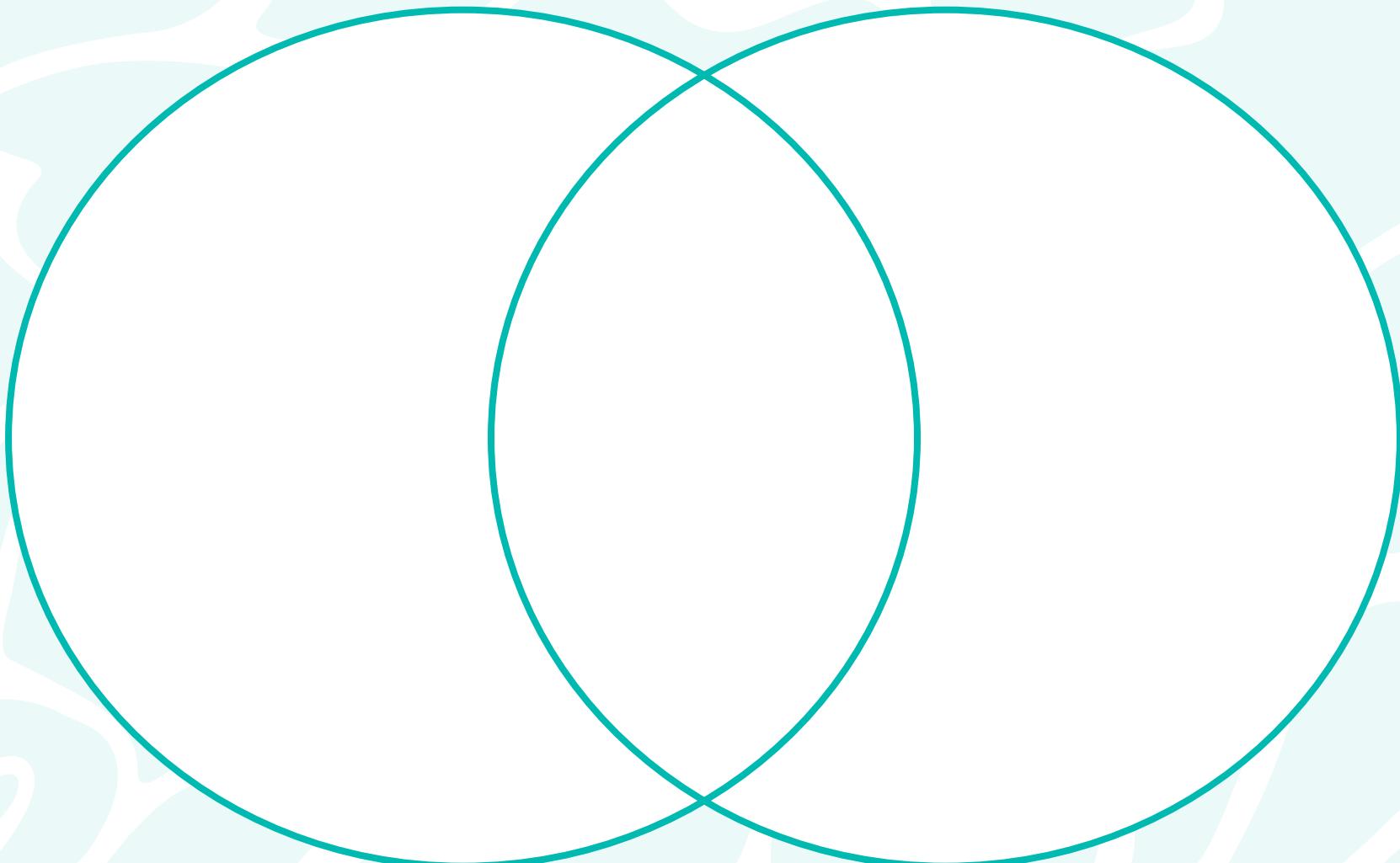
Sea squirt - Star ascidian

Sponge - Breadcrumb sponge

Name:

What's the Difference?

Look closely at your 2 chosen marine creatures. Record similarities and differences in their adaptations. Think about how they move, body shape, how they feed and where they live.



Creature 1

Creature 2



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.



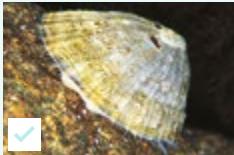
Have fun!

Name: _____

Rockpool Spotter Sheet



Barnacles



Common limpet



Painted top shell



Purple/flat top shell



Grey top shell



Cockle



Razorshell



Common whelk



Dog whelk



Common starfish



Cushion star



Beadlet anemone



Common periwinkle



Cuttlebone



Skate/Ray egg case



Catshark egg case



Snakelocks anemone



Breadcrumb sponge



Brittle star



Star ascidian



Bladderwrack



Velvet swimming crab



Hermit crab



Common shore crab



Common blenny



Rock goby



Prawn



Mussel



Pipefish



Tompot blenny



Sea scorpion



Sandhopper