

Chloroplasts

roots

FAREHAM

SOLENT SEASCAPE

DISCOVERY BOOK KIT

KS-3

EXPLORE, RESTORE, MAKE IT YOURSELF!

OF WIGHT

Light Energy



WELCOME TO THE SOLENT SEASCAPE

Now that you've started exploring, you know the Solent isn't just a stretch of the ocean - it's a seascape. That means it's made up of different habitats like seagrass meadows, saltmarshes, native oyster reefs and seabird nesting sites - all working together like a team.

These habitats keep the ocean healthy, help fight climate change and support both nature and people. But many of them are in danger and need our help!



Photo by Shaun Roster

That's why they so urgently need protecting. The Solent Seascape Project team each look after a different habitat in the Solent. This seascape is an interconnected system, so every part of it must be healthy for all of it to thrive.

Let's find out more about what they do.

MEET OUR SEASCAPE CHAMPIONS

Can you identify which habitat each champion protects? Write this underneath the picture.



LOUISE:



ELLIE:



LUKE:



WEZ:

WHAT CAN YOU DO TO BE A SEASCAPE CHAMPION?

What kind of jobs could you do or what actions could you take?



WHAT SKILLS WOULD YOU NEED?

You can find out more at
<https://solentseascape.com>



OUR BLUE PLANET: WHAT IS GEOGRAPHY?

Geography is the study of people, places and our planet. It helps us understand how Planet Earth works and how people use, change and depend on different places.

Geography has three main branches:

Physical geography is the study of natural features on Earth - such as rivers and coasts.



Photo by Gavin Holder

Human geography is the study of how people live, build and use different places.



Photo by Shaun Roster

Environmental geography is the study of how people and the natural world change each other, affecting the environment we live in.



Photo by Luke Helmer

Physical, human and environmental geography are all connected. This means that if one of them changes, the others can change too. For example, a change like rising sea levels can affect where people live and harm wildlife.

Geographers study these connections to understand problems and help improve the environment. In the Solent, restoring natural habitats can reduce flooding, support wildlife and help local industries stay sustainable.



Photo by Theo Vickers



Photo by Matt Jarvis



Photo by James Blake

Questions to talk about:

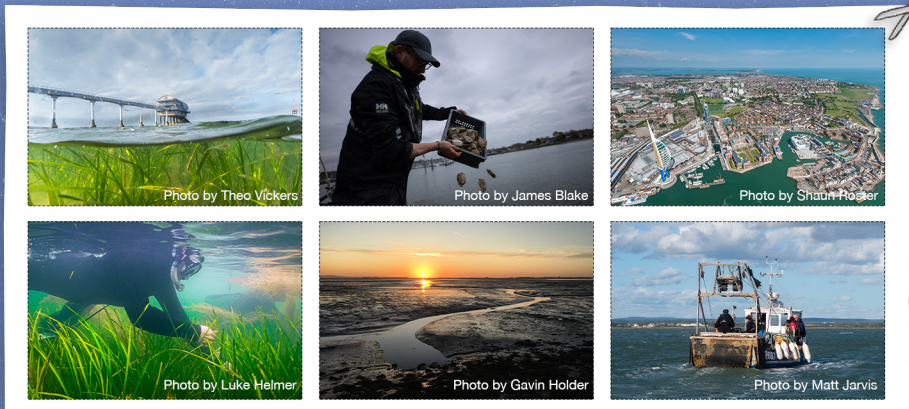
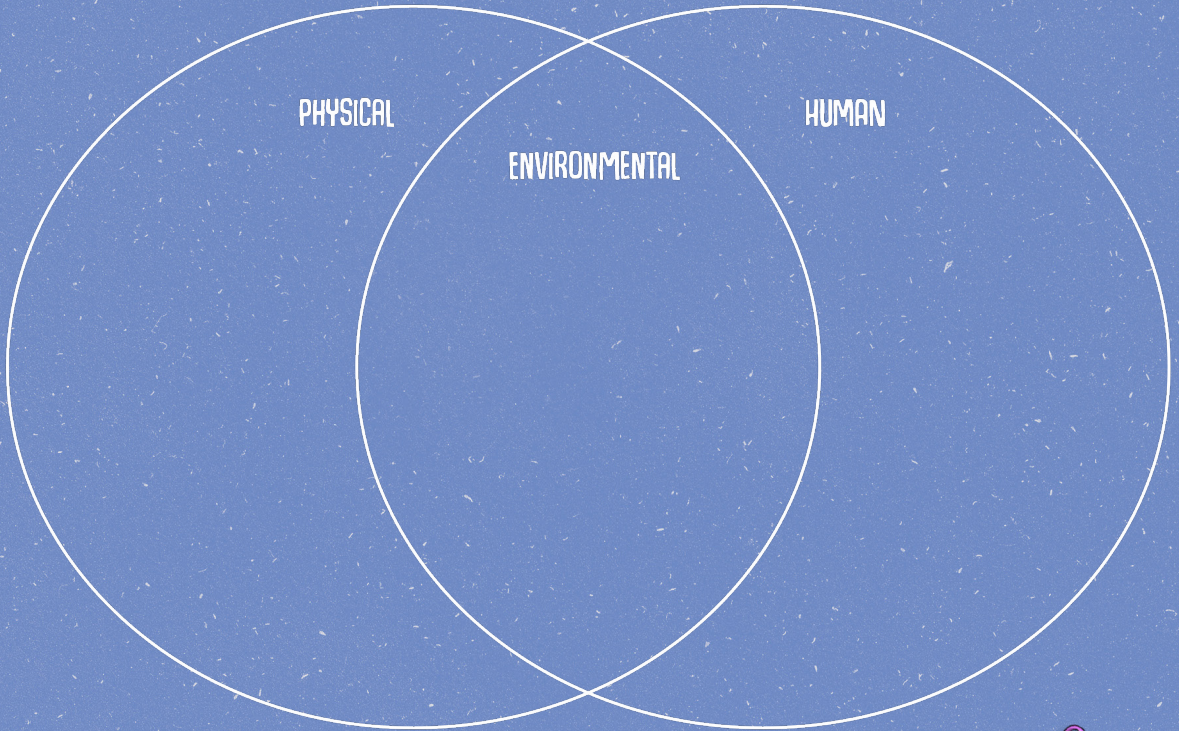
Why is it important to study geography together?

How could geography help us solve environmental problems in the future?

SORT IT OUT: PHYSICAL, HUMAN OR ENVIRONMENTAL

Look at the pictures below. Cut them out and place them in the correct part of the Venn diagram.

Cut along the dotted lines. Stick or place each picture in the right spot. Draw and label one of your own too.



OUR BLUE PLANET: THE OCEANS THAT CONNECT US

Earth has five oceans and they are all linked. Together, they cover over 70% of the planet. Oceans move water, heat and living things around the world. They help control the climate, support wildlife and produce oxygen.

The Five Oceans



PACIFIC OCEAN:

The biggest ocean, full of whales and sea turtles, who swim almost everywhere.



ARCTIC OCEAN:

Smallest and coldest, around the North Pole.



ATLANTIC OCEAN:

Between Europe, Africa and the Americas. Dolphins and jellyfish swim here on their way to all oceans.



SOUTHERN OCEAN:

Surrounds Antarctica, where penguins and seals live.



INDIAN OCEAN:

Warm and deep, between Africa, Asia and Australia.

Oceans are global systems, not separate bodies of water. They store carbon, carry nutrients and connect people through trade and travel.

Currents (steady flows of moving seawater) move heat and water across the planet. Many animals migrate (travel long distances for food or breeding) across different oceans. Because the oceans are linked, a change in one can affect life in another.

Questions to talk about:

Why do we say the oceans are “connected”?

Why is the Atlantic Ocean important for the Solent?

THE FIVE OCEANS AND THEIR CURRENTS



How are our oceans connected?

This map shows how the biggest currents in our oceans combine to make up what is called the **Great Ocean Conveyor Belt**. It's called a conveyor belt because it moves vast amounts of water, heat, oxygen and nutrients around the planet, playing a crucial role in regulating Earth's climate.

Find the route water takes to get from the Southern Ocean to the Solent.

Question to talk about:

How might changes in other oceans eventually affect plants and animals in the Solent?

OUR BLUE PLANET: THE SOLENT

The Solent is part of the Atlantic Ocean, sitting between mainland England and the Isle of Wight. It is shaped by **physical geography** (tides, rivers and coastal habitats) and **human geography** (towns, ports and shipping routes).

It is also an example of **environmental geography**, where people and nature interact. Natural habitats like **saltmarshes**, **seagrass meadows** and **oyster reefs** sit right next to busy human areas such as ferry ports, harbours and seaside towns. This makes the Solent a working **seascape**, where human activity depends on a healthy environment.



Photo by Shirley Rushmer



Photo by Matt Jarvis



Photo by Louise MacCallum

Looking at the Solent on a map helps us understand both the benefits and problems of this close connection. For example, saltmarshes help reduce flooding by soaking up extra water. But building too close to the shore can damage these habitats and increase the risk of flooding.



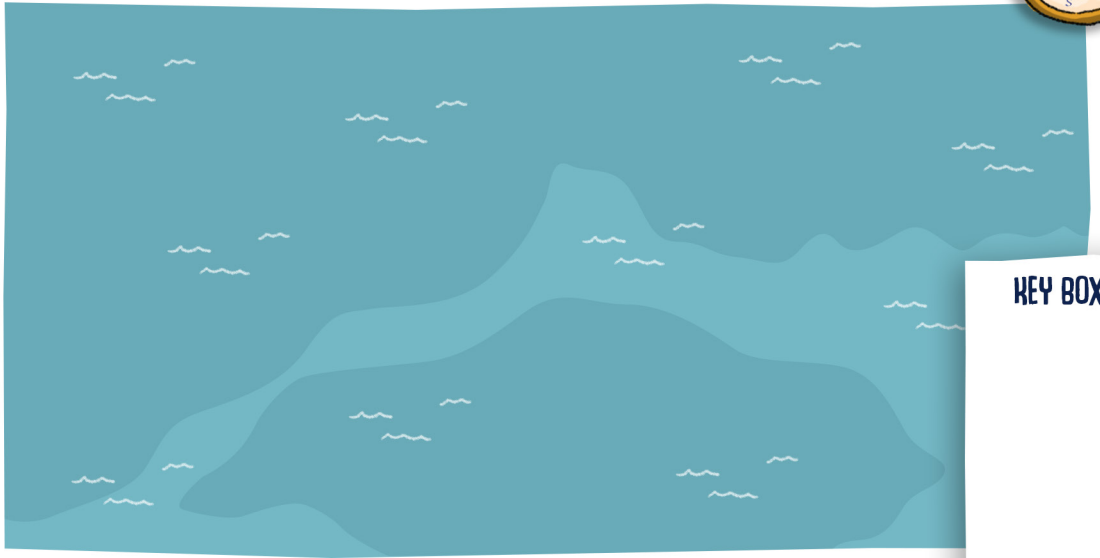
Questions to talk about:

Why is it important to show habitats as well as towns and ports when mapping the Solent?
How can maps help us make better choices about protecting coastal areas?

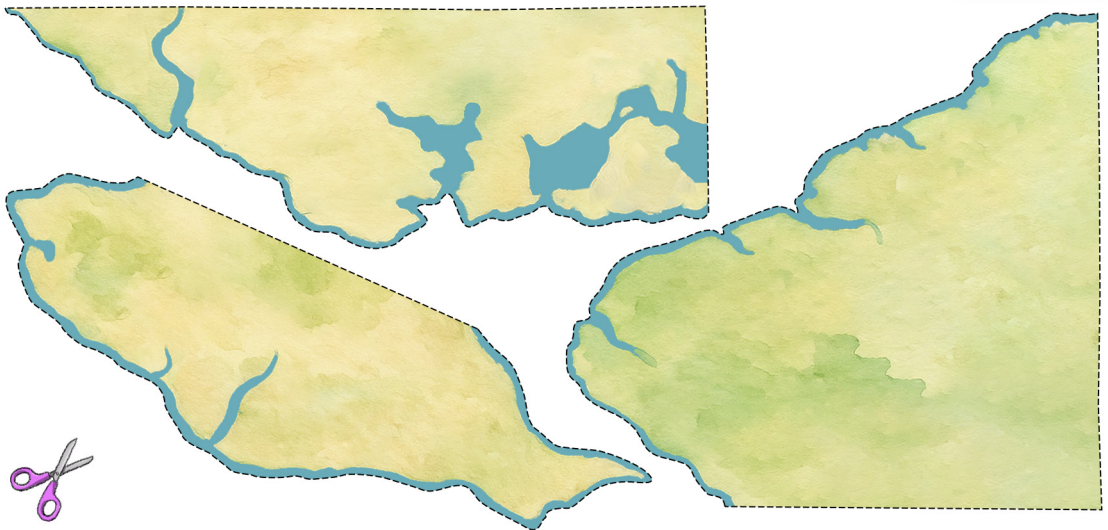
BUILD IT: MAP OUT THE SOLENT

Caring for the Solent starts by knowing it - let's build a map to help.

1. Cut out the map pieces.
2. Place them on the blue square to build your own Solent Seascape.
3. Label the habitats and cities of the Solent on your map and give your map a title.
4. Draw a symbol for each feature and explain what it means in the key box.



KEY BOX



SALTMARSHES: CARBON TRAPS

Saltmarshes form where rivers meet the sea. They are intertidal, meaning they flood at high tide and uncover at low tide. Saltmarshes may look like just mud and plants, but they are busy, living habitats.

Vibrant food chains help keep the whole ecosystem working. For example, tiny worms live in the mud and feed on plants. Crabs eat the worms. Young bass feed on small crabs. Redshanks (wading birds) eat the fish.



Photo by Paul Adams

Saltmarsh plants also **protect coastlines**. Their roots hold mud in place and absorb energy from waves. They also **store carbon**.

When saltmarsh plants die, they get buried in mud. The mud **traps their carbon for hundreds of years**, stopping it from being released into the air. This helps slow climate change because less carbon dioxide (CO₂) enters the atmosphere.



Photo by Matt Jarvis

Saltmarshes are shrinking because of pollution, new buildings, rising sea levels, more frequent storms and increased boat activity. When they are damaged, the food chains are broken, wildlife loses habitat and stored carbon can escape.

The **Solent Seascape Project** is helping restore saltmarshes by adding mud and planting native plants so the habitat can recover.

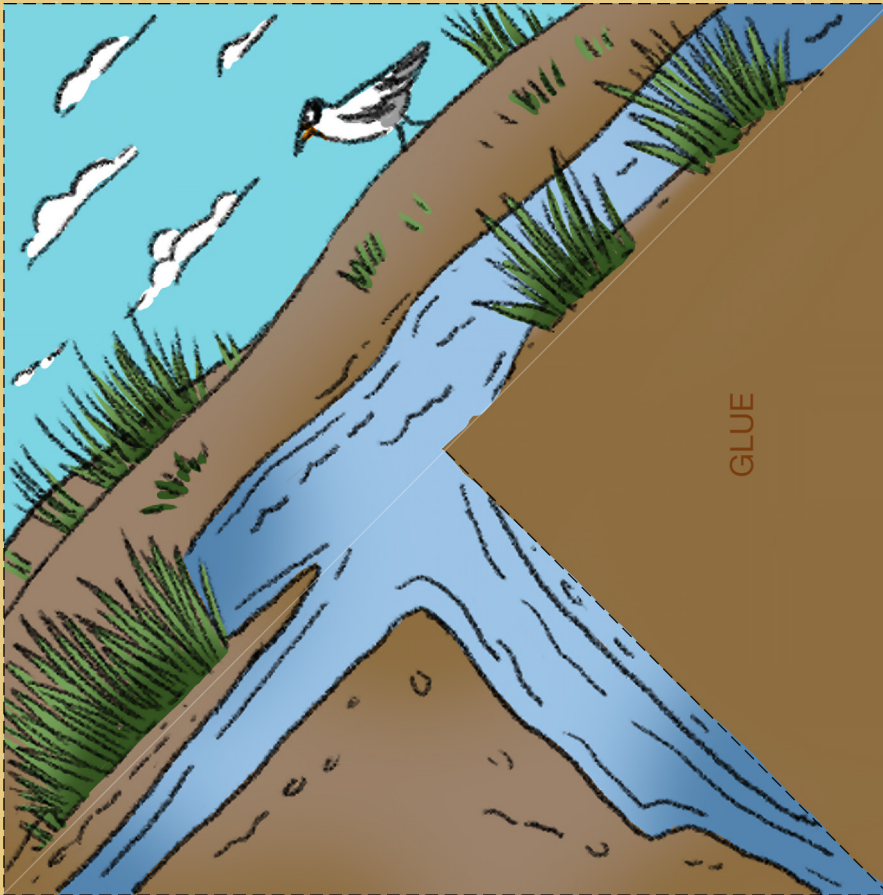
Questions to talk about:

How does carbon stored in saltmarshes help slow climate change?

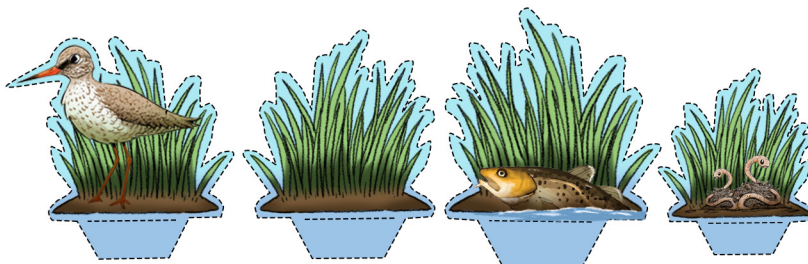
What might happen if saltmarshes disappear?

WHO EATS WHO?

1. Place each animal or plant in the correct part of the saltmarsh.
2. Add arrows to show who eats who.
3. Add the correct labels: producer or consumer.



Turn to the back page to find out how to make your mini habitat. You will find a sheet waiting for you to cut out and create in your Book Kit pocket!



PRODUCER
CONSUMER
PRODUCER
CONSUMER



OYSTER REEFS: BIODIVERSITY

Oyster reefs form when oysters grow in clusters on the seabed. These reefs are **biodiversity hotspots** because they provide food, shelter and nursery areas for many species.

Oysters are **filter feeders** (they clean water by sucking it in, trapping tiny particles and releasing the clean water). Their reefs also **stabilise the seabed** (the shell and the algae attached to it hold the mud and sand in place, so it doesn't wash away).



Photo by Theo Vickers

How different species use oyster reefs:

Oysters build the reef.
Crabs hide and feed between shells.
Sea bass hunt on the reef.
Seahorses cling to shells for shelter.
European eels rest in deeper gaps.

Oyster reefs are being damaged by **overfishing**, **pollution** and **disease**, which reduces biodiversity.

The **Solent Seascape Project** is building reefs in the Solent by dropping thousands of tonnes of gravel and shell onto the seabed to make a home for native oysters, and then placing tens of thousands of adult oysters on top.



Photo by James Blake



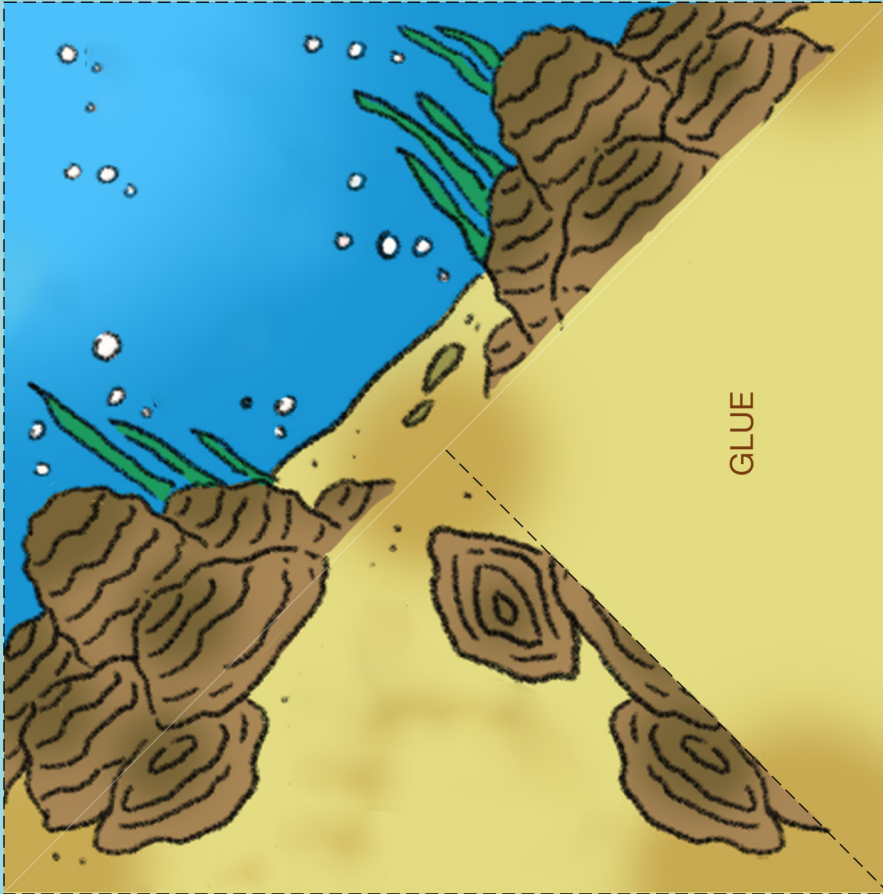
Photo by Molly Robinson

Questions to talk about:

Why are oyster reefs “biodiversity hotspots”?
How does oyster filtering help the reef community?

WHO LIVES WHERE?

1. Place the oysters in clusters at the bottom - that's the reef!
2. Where would each animal go on the reef? Stick them in the correct place.
3. Use the label strip to add the right word next to each animal: feeding, hiding or hunting.



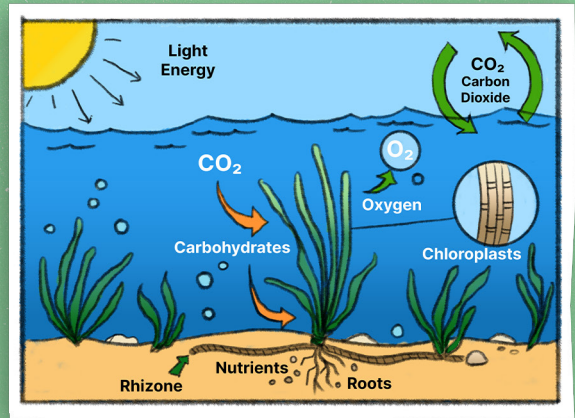
Turn to the back page to find out how to make your mini habitat. You will find a sheet waiting for you to cut out and create in your Book Kit pocket!



SEAGRASS MEADOWS: PHOTOSYNTHESIS

Seagrass meadows grow in shallow waters in the Solent. Seagrass is the **only flowering plant that grows fully underwater**. It supports life and protects coastlines.

Seagrass **uses sunlight to make its own food**. During this process, it takes in **carbon dioxide** (CO_2) and releases **oxygen** (O_2). **Chloroplasts** are tiny parts of plant cells that help do this work. This helps boost oxygen levels so sea life can breathe.



Seagrass also traps **carbon** in the seabed, locking it away for hundreds of years. This helps slow climate change.

Seagrass meadows act as nursery areas, giving young fish like bass and seahorses safe places to hide, feed and grow. Their roots hold the sand in place, and their leaves break up energy from waves which reduces erosion (when waves and currents wear away the coastline).



Without seagrass we lose oxygen in the water, stored carbon and important habitats for sea life. This reduces biodiversity (the variety of living things in an area) and makes climate change worse.

The **Solent Seascape Project** is helping restore seagrass in the Solent by replanting it. This helps habitats recover and keeps the water full of oxygen.

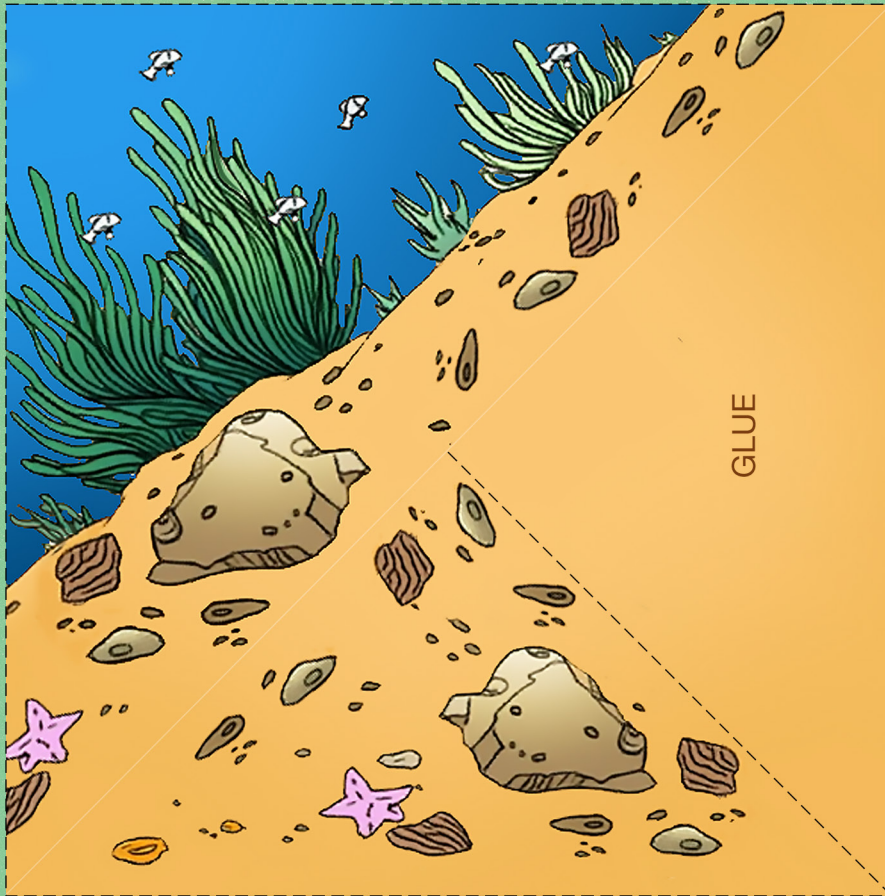
Questions to talk about:

What happens to oxygen levels if seagrass meadows are destroyed?

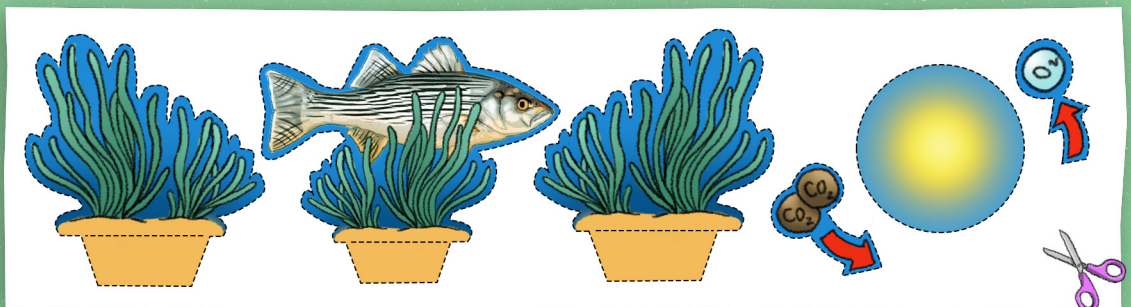
How does seagrass help both humans and animals?

WE ALL NEED OXYGEN

1. Cut out the sunlight shining through the water, the CO₂, the O₂ and the seagrass.
2. Look at the arrows - where does each piece belong?
3. Using the help of the diagram on page 14, stick the pieces into the scene to show how CO₂ is trapped and O₂ produced.



Turn to the back page to find out how to make your mini habitat. You will find a sheet waiting for you to cut out and create in your Book Kit pocket!



INSIDE THE SEABIRD NESTING SITES: LIFE CYCLES

Every spring, Little Tern, Common Tern and Sandwich Tern **migrate** back to the Solent to **breed** (lay eggs and raise young).

Terns nest on **shingle and gravel** near the coastline. These are small pebble- covered areas that sit low in the water, so nests can be easily **flooded or disturbed**. Disturbance includes dogs running nearby, people walking too close, or loud activity.

The life cycle

A life cycle is the stages an animal goes through from birth to adult.



Eggs are laid in shallow scrapes or small bowl-shaped dents in the gravel. They must stay dry and safe. If waves reach them or someone steps near them, the **clutch** (group of eggs) can be lost.

Terns eat small fish like sprats and sand eels. Pollution, fewer fish or poor water quality makes chick survival harder.

Threats to Tern colonies

Rising sea levels, disturbance from people or dogs and natural predators all reduce breeding success.

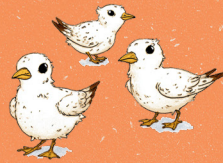
If one life-cycle stage fails, the colony may not raise enough young to survive.

Questions to talk about:

What might happen if people walk through the nesting area?
Why is important to protect all stages of the tern's life cycle?



Chicks hatch covered in soft fluff. They stay on the ground and cannot fly. They rely on their parents for food, so disturbance or a lack of fish can put them at risk.



Fledglings are young birds learning to fly. They grow **flight feathers** (the strong feathers needed for flying) and practise short flights. They need the shore to hunt small fish and build strength for their next migration.



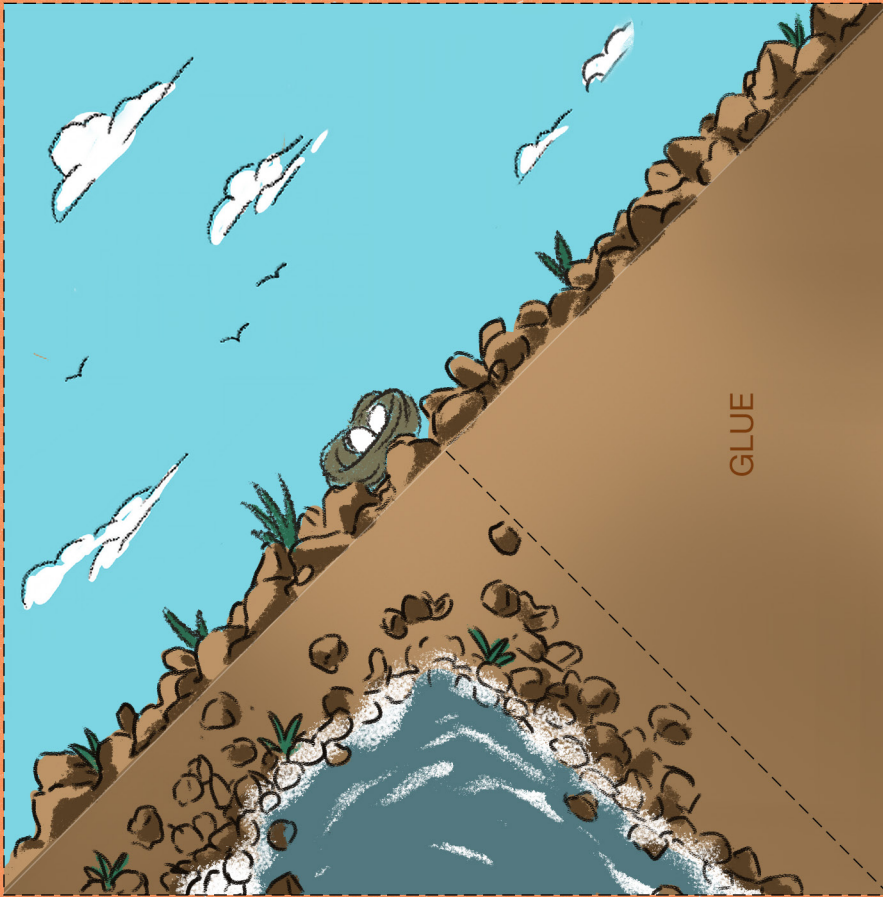
Adults return to the same nesting area each year. A group nesting together is a colony. If a colony fails, recovery takes years because terns raise only a few chicks each season.

Protecting Tern habitats

The **Solent Seascape Project** builds raised gravel islands that sit above most high tides and creates safer areas like islands, protected from predators and disturbance. Scientists, volunteers and bird watchers monitor colonies to track their long-term health.

LET'S PROTECT THE TERNS

1. Look at the information on the left to remind yourself where each stage belongs.
2. Stick the life stages where they should go: eggs in scrapes, chicks on the ground, fledglings near the water.
3. Add protections like raised islands or fences where they're needed to keep the terns safe.



Turn to the back page to find out how to make your mini habitat. You will find a sheet waiting for you to cut out and create in your Book Kit pocket!



CHECK IT!

Use the four habitats you have made to help answer these questions.

1. What does seagrass release during photosynthesis? Circle the correct answer.

Carbon dioxide

Saltwater

Oxygen

Mud

2. Match the statement to the habitat:

Tern Nesting Site

Traps carbon dioxide and makes oxygen

Oyster Reef

A safe place for chicks to hatch

Saltmarsh

Filters water and gives shelter to animals

Seagrass Meadow

A wet marshy area full of hidden creatures

3. Tick the true statements.

Producers are not important to the life cycle.

Oyster reefs form when oysters grow in clumps.

Building gravel islands will help protect young terns.

Humans would be fine without the oxygen made by ocean plants.

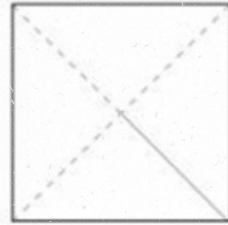
4. Explain in writing.

Look at your saltmarsh and tern nesting site habitats. Why is it important to protect animals when they are young?

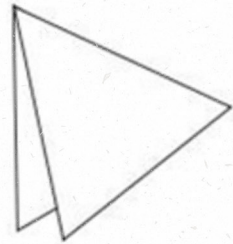
MAKE YOUR OWN MINI SOLENT HABITAT!

You will need: glue and scissors

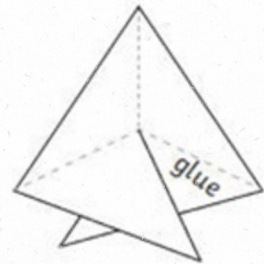
1. Cut out the big square.



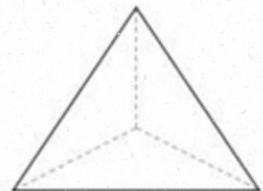
2. Fold the square in half from corner to corner - do this both ways.



3. Cut along the dotted line to centre of the square, fold the printed triangle section over the plain triangle marked 'glue' and glue down.



4. Cut out and stick in the creatures and features from your sheet where you think they should go.



That's it - you have made your own mini habitat!

NEW JERSEY



PLANETARI



**BLUE MARINE
MAX STENBECK**
LEGACY PROGRAMME

