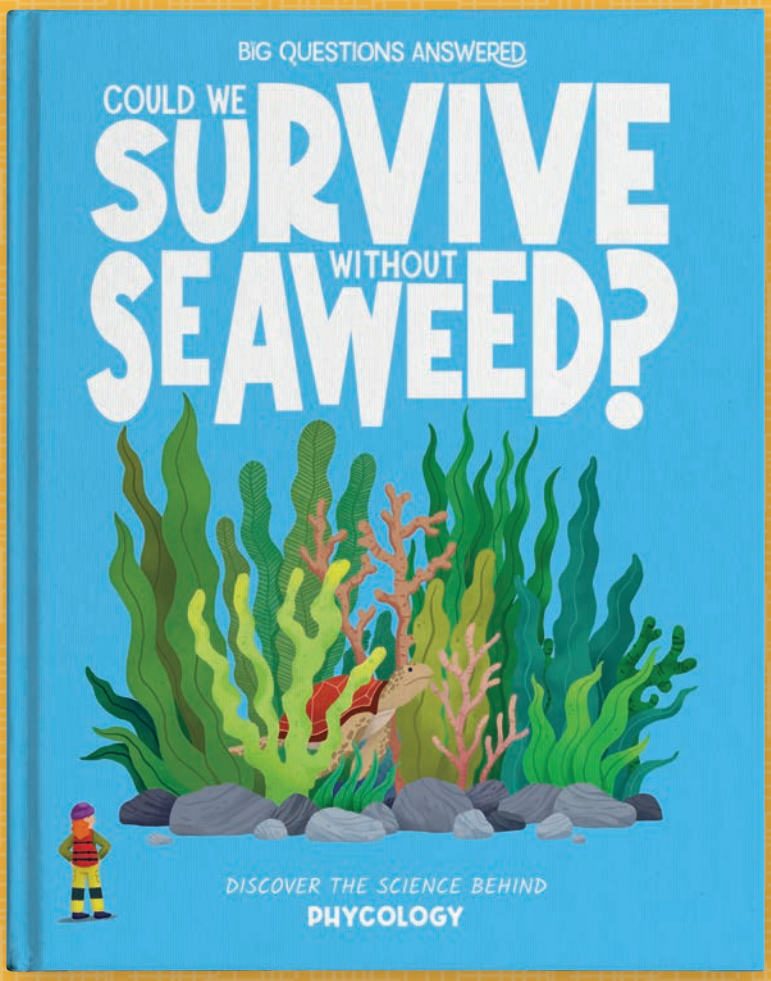
BIG QUESTIONS ANSWERED

TEACHERS' & PARENTS' RESOURCES



Full of thought-provoking questions and fascinating extra information to accompany this book!

CONTENTS:

INTRODUCTION

NOTES FOR TEACHERS, HOME EDUCATORS AND PARENTS

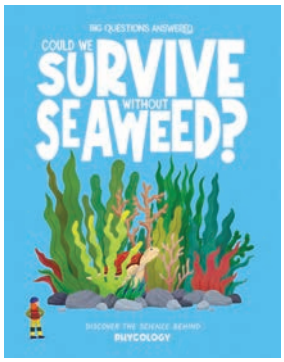
Inspire children's natural curiosity, improve literacy, and have fun learning about different sciences with The Big Questions Answered. Each book in the series is accompanied by a selection of fantastic, **FREE** downloadable resources.

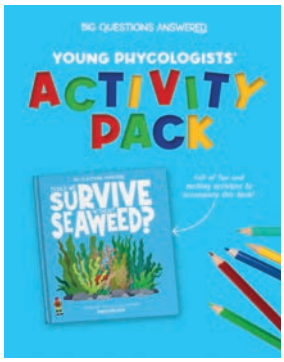
Our **Teachers' and Parents' Resources** booklets are full of ideas for discussions, extra facts, and links to hands-on activities – all great ways to help children explore each field of science and the key topics surrounding them.

Our **Young Scientists' Activity Packs** are a real bonus. They're full of soft-learning, fun activities, all subtly linked to the field of science, that will encourage independent learning. Visit the 'Kids' Zone' to find out more.

Don't forget, on the website you can also download our **'Meet the Scientist' pages** – there's one to accompany each book – and sign up to our newsletter to follow what's coming up next for The Big Questions Answered. Download all these and more at: **www.thebigquestionsanswered.com**

Could We Survive Without Seaweed? book





Young Phycologists' Activity Pack

KEY CURRICULUM TOPICS

The resources related to *Could We Survive Without Seaweed?* tie in with key curriculum topics including:

- Animals, including humans
- Earth and space
- Geography
- History
- Light
- Living things and their habitats
- Plants
- Working scientifically

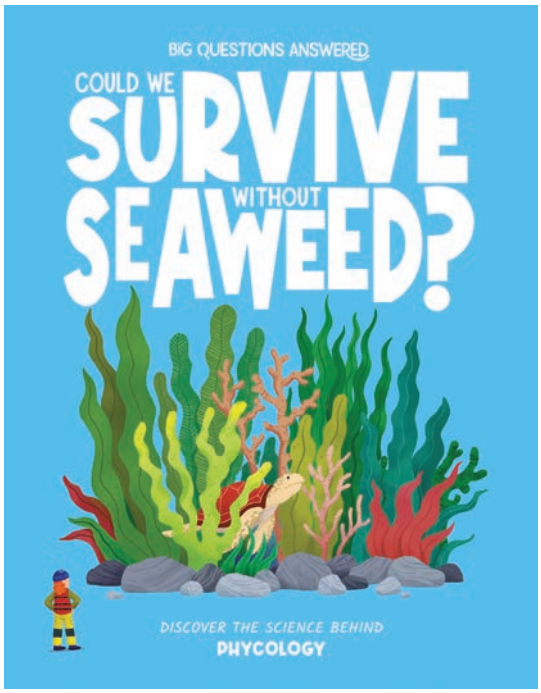
The most relevant topics are indicated throughout this guide.

COULD WE SURVIVE WITHOUT SEAWEED?

This book dives into the extraordinary world of seaweed by exploring whether we could live without this amazing type of algae. As well as covering how important seaweed is to animal species living in water, the book also explores its uses on dry land and how it could play a critical role in protecting Earth against climate change.

PRE-READING QUESTIONS

Engage in discussion about the general topic of phycology and seaweed with the suggested questions below.



- **What do you know about seaweed already?**
- **What do you want to find out about seaweed?**
- **Do you think we could survive without seaweed?**

APPEARANCES CAN BE DECEIVING: SCENE 1

The material for this scene can be linked to curriculum topics, including:
Animals, including humans; living things and their habitats; plants.

Introduce children to the incredible world of seaweed and encourage them to share what they know about seaweed. Explore the different ecosystems that can be found on Earth and which one is the biggest.

DISCUSSION PROMPTS

- **What do you know about seaweed already?**
Encourage children to discuss what they know about seaweed, and what they may be curious to learn about it.

- **What do you know about crabs?**
Information overleaf

- **What do you think the largest ecosystem on Earth is?**
Information overleaf

ACTIVITY

Corresponding activity on page 3 of the activity pack: 'Rock Pool Diary' is a creative writing activity which encourages children to imagine they are going rock pooling, and describe the things that they see and do in a diary entry.

APPEARANCES CAN BE DECEIVING: SCENE 1

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

CURIOUS CRABS

Crabs are a type of animal called a **crustacean**. They have hard outer shells called **exoskeletons** and are related to animals like lobsters and shrimp.

There are thousands of different **species** that can be found all across the world, in water that is deep and shallow, hot and cold, light and dark.

Most crabs are **omnivores**, meaning that they eat both plants and other animals. Seaweed makes up part of their diet!

There is even a species of crab called a 'hairy seaweed crab'! As its name suggests, it looks like it's covered in lots of tiny pieces of seaweed.

THE WORLD'S OCEANS

Planet Earth is covered in lots of different types of **ecosystems**, including deserts, rainforests, tundra, and grasslands.

The biggest ecosystems of all are the oceans, which cover over 70% of Earth's surface.

They're so big, in fact, that scientists are finding new species of plants and animals living in the oceans every year!

The biggest ocean is the Pacific Ocean. You could put all of Earth's **landmasses** together and they would still be smaller than the Pacific!

It is home to the Mariana Trench, which is the deepest known place on Earth. It's deeper than Mount Everest is high, extending 10,000 metres (36,000 feet) down!

AMAZING ALGAE: SCENE 2

The material for this scene can be linked to curriculum topics, including:
Living things and their habitats; plants; working scientifically.

Explore the different categories of seaweed and the variety of places and temperatures that they prefer to grow in. Discuss whether seaweed is a plant or not.

DISCUSSION PROMPTS

- **Do you think seaweed is a plant? Why or why not?**

Encourage children to point out features of plants and seaweed while forming this opinion. There is also information overleaf.

- **Apart from their colour, do you think there are any differences between red, green, and brown seaweed?**

Information overleaf

- **What colour seaweed have you seen the most?**

Encourage children to recall any places they have been to where they have seen seaweed and what colour was the most common.

ACTIVITY

Corresponding activity on page 4 of the activity pack: 'Astonishing Oceans' is a true or false quiz. Children use what they have learnt from reading the main book, as well as their intuition, to fill in the answers.

AMAZING ALGAE: SCENE 2

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

IS SEAWEED A PLANT?

Seaweed is not considered a plant!

It is actually a type of algae, a group of **aquatic organisms** that may look like plants but have some key differences.

Plants all have **roots** that extend beneath them into the soil and allow them to **absorb** water and **nutrients**.

Rather than roots, seaweeds have something called a holdfast. This anchors it to the seabed and stops it from being washed away by **water currents**.

Plants also have **stems** that provide them with structure and support the leaves.

Seaweeds don't have stems either – instead they have stipes, with blades in the place of leaves.

TYPES OF SEAWEED

Green seaweed is better suited for growing in shallower, warmers water compared to red seaweed, which mostly prefers to grow in deeper water with less light.

There are over 6,000 different **species** of red seaweed, making it the most common out of the three main categories. It is also the most frequently eaten by humans.

For example, a type of red seaweed called nori is used to wrap sushi. It might appear green, but this is because it has been dried before use.

Brown seaweed, on the other hand, grows in the coldest water of the three categories.

UNDERWATER CITIES: SCENE 3

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats.

Discuss what the tallest organism in the world is with this spread about huge kelp forests. Explore some of the fish species that live in these exciting, dynamic habitats.

DISCUSSION PROMPTS

- **What do you think the largest plant or tree in the world is?**
  Information overleaf

- **Where do you think the largest plant or tree in the world is?**
  Information overleaf

- **Do you know what the largest fish in this scene are called?**
  Information overleaf

ACTIVITY

Corresponding activity on page 5 of the activity pack: 'Sneaky Fish' is an odd one out activity where children must spot the fish that stands out from the rest of the shoal.

UNDERWATER CITIES: SCENE 3

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

LARGEST PLANTS AND TREES IN THE WORLD

Despite the huge lengths that kelp can grow to, it is not the tallest **organism** growing on Earth!

That title is held by a tree called Hyperion. It is a type of tree called a coastal redwood and is located in California in the United States.

When it was discovered in 2006 by two explorers it measured an amazing 115 metres (379 feet) tall! Despite scientists thinking that Hyperion is between 600 and 800 years old, it is still growing. By 2019 its height had increased to 116 metres (380 feet).

There is another, separate record for the world's largest plant – rather than height, this record is about the plant that covers the biggest **area**.

That belongs to a type of **seagrass** found underwater off the coast of Australia.

By continuously copying itself, it has grown over an area 180 kilometres (111 kiles) wide. Because each individual strand of the seagrass has been **cloned** from a single **seedling**, it can be counted as one single plant!

CALIFORNIA SHEEPHEAD

The California sheephead is one of many species of fish that live in kelp forests.

They glide between the strands of their **habitat** in search of other kelp forest inhabitants to eat, like snails and urchins.

Their teeth, which stick out from their mouth quite a bit, allow the California sheephead to also eat hard-shelled prey like crabs and other **crustaceans**.

They are also very long-living fish – scientists believe that the oldest ever California sheephead was over 50 years old!

IMPORTANT HABITATS: SCENE 4

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats.

Discuss some of the amazing species of animals that live in kelp forests. Explore the fascinating ways that they interact with their environments and with each other.

DISCUSSION PROMPTS

- **Why do you think scientists consider otters to be intelligent animals?**
  Information overleaf

- **Can you think of any predators that hunt grey whales?**
  Information overleaf

- **Do you think seals are predators or prey in a kelp forest?**
  Information overleaf

ACTIVITY

Corresponding activity on page 6 of the activity pack: 'Home Sweet Home' is a classic word search activity that introduces children to lots of different species of animals that live in kelp forests.

IMPORTANT HABITATS: SCENE 4

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

SEA OTTERS

Sea otters are considered to be some of the smartest creatures in the animal kingdom.

They are one of the only **marine mammals** that are known to use tools.

Because they eat things like clams and mussels, they need to find a way of getting the shells of their **prey** open before they can start eating.

The way that they do this is by using rocks to crack them open!

Other animal species that scientists know use tools include elephants and chimpanzees – otters are part of a very clever group of animals!

GREY WHALES

Grey whales are among the largest animals that spend time around kelp forests, growing up to 15 metres (49 feet) long!

They **migrate** the longest distances of any **mammal**, spending the summer months in the Arctic and the winter off the coast of North America. It is in these shallower waters that they have their **calves**.

Kelp forests are very important places for these whales. As well as using them to search for food like **invertebrates** and **crustaceans**, they provide shelter and safety from predators like orcas.

COMMON SEALS

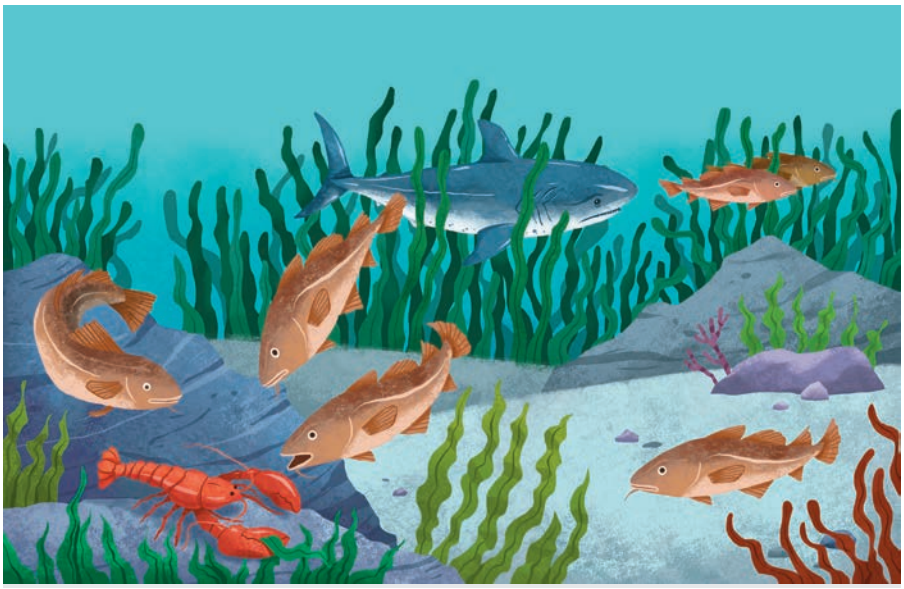
Common seals are one of the top **predators** in a kelp forest. They eat all sorts of animals, from squid and fish to crabs and mussels.

But seals still have to keep an eye out! Larger animals like orcas and sharks will happily prey on them if they are given the opportunity.

THE FOOD CHAIN: SCENE 5

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats; plants.

Explore the different layers of the food chain with this spread about the importance of seaweed to this important interconnected web.



DISCUSSION PROMPTS

- **What is the food chain?**
  Information overleaf

- **Do you know what the species of shark in this scene is?**
  Information overleaf

- **Can you name three animals that link together to make a food chain?**

ACTIVITY

Corresponding activity on page 7 of the activity pack: 'Making an Escape' is a maze activity where children must help the fish reach safety from the hungry shark.

THE FOOD CHAIN: SCENE 5

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE FOOD CHAIN

The food chain is a way of describing the interconnected way that plants and animals get their energy.

There are different levels in a food chain, with the creatures and **organisms** at the very bottom forming the foundation of the entire network.

- Producers are at the very bottom of the food chain. They are usually plants or other similar organisms, like seaweed, that use **photosynthesis** to create their own food
- and energy.

- The next level up consists of primary consumers, which eat the producers. Examples of primary consumers in the ocean include krill and small fish like herring.

- Animals like cod are secondary consumers. They can be either **carnivores**
- or **omnivores**.

- Tertiary consumers are right at the top of the food chain. Also known as **apex predators**, they don't have any natural predators themselves. Famous examples in the ocean include great white sharks and orcas.

The food chain is so interlinked that if a producer like seaweed disappeared, it would have a ripple effect that negatively affects every animal in the chain!

SALMON SHARKS

Adult salmon sharks are apex predators in their environment.

They get their name because a large part of their diet consists of salmon fish, although they do eat other **species** like herring, cod, and even squid.

They are very strong swimmers and are closely related to the great white shark.

However, they are not as big as their more famous **relatives**. Most salmon shark grow to be 2.5 metres (8 feet) long, compared to the great white shark's 4.5 metres (15 feet).

CLEANING THE OCEANS: SCENE 6

The material for this scene can be linked to curriculum topics, including:
Animals including humans; light; living things and their habitats; plants.

Explore the different layers of the ocean with this spread about the incredible role that seaweed has in keeping the oceans clean of certain types of pollution. Discuss different species of animals that live in the ocean.

DISCUSSION PROMPTS

- **How many different layers of the ocean are there?**
Information overleaf

- **How many species of sea creatures can you name? Which is your favourite?**
Encourage children to discuss whether they have a favourite sea creature, and use their knowledge to explain why.

- **What kinds of animals do you think live in each layer of the ocean?**
Information overleaf

ACTIVITY

Corresponding activity on page 8 of the activity pack: 'Crystal Clear Water' is a creative drawing activity where children imagine they are going diving, and draw a scene featuring the animals that they spotted.

CLEANING THE OCEANS: SCENE 6

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

LAYERS OF THE OCEAN

Scientists agree that there are five main layers in the ocean. Each layer has its own incredibly vast group of animals that call it home!

The five layers are:

- **Trenches**: Trenches like the **Mariana Trench** make up the very bottom layer of the ocean, below 6,000 metres (19,700 feet). Despite the extreme environment, there are actually many **species** that live there, like goblin sharks, vampire squid, and snailfish. More animals being discovered living here every year!

- **The abyss:** The abyss is so far underwater that sunlight can't reach it and the water is near freezing! Even though there is no light, little food, and immense **pressure** from the weight of the water, lots of animals thrive here, including gulperfish and Dumbo octopuses.

- **The midnight zone:** This makes up as much as 70% of all the seawater on Earth! It is the largest environment on the planet. There still isn't much light in this area, so certain species of animals have developed to communicate through **bioluminescence**. Animals that live here include dragonfish, deep-sea anglerfish, and gulper eels.

- **The twilight zone:** Spanning between 200 metres (656 feet) and 1,000 metres (3,280 feet), scientists think that the twilight zone has more fish living in it than the rest of the ocean put together! Animals that scientists have spotted in this layer include giant squid, lanternfish, and whale sharks.

- **The sunlight zone:** Finally, the sunlight zone is the uppermost layer of the ocean. It is both the lightest and the warmest. Animals that live in the sunlight zone include the narwhal, which ancient sailors believed were underwater unicorns because of their horns! Alongside the narwhal, creatures like blue whales, great white sharks, and sealions all also live in this layer of the ocean. This is also the only layer where plants are able to grow!

SHIELDING THE COASTLINE: SCENE 7

The material for this scene can be linked to curriculum topics, including:
Animals including humans; geography; rocks.

Explore how powerful waves from the sea can help to shape the land with this spread about the destructive effects of erosion. Discuss different types of erosion and what causes them.

DISCUSSION PROMPTS

- **What is erosion and how does it work?**
Information overleaf

- **Do you recognise the species of bird in this scene?**
Information overleaf

- **Do you have a favourite bird? Why is it your favourite?**
Encourage children to discuss whether they have a favourite bird, and use their knowledge to explain why.

ACTIVITY

Corresponding activity on page 9 of the activity pack: 'All Around the World' is a fact file activity. Children must choose an ocean, research it, and fill in the fact file. This activity can be printed multiple times to generate a fact booklet!

SHIELDING THE COASTLINE: SCENE 7

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

WHAT IS EROSION?

Erosion is the gradual wearing away of material from riverbeds and the coastline by water.

This can happen in several ways:

- The sheer force of waves crashing against the coastline can break bits of rock apart in a process called **hydraulic action**. Strong storms can cause this to happen at a much quicker rate than normal.

- Over time, rocks carried by the **current** can rub against and wear away at bigger chunks. Scientists call this abrasion.

- Caves are created through a type of erosion called compression. As the name suggests, air inside cracks in the rock gets compressed by waves repeatedly hitting it. Over time, this causes the cracks to spread and rock to break away.

- Certain types of rock, like limestone, can even be **dissolved** by water.

Many famous landmarks around the world have been created by erosion, including the Grand Canyon in the United States and the Twelve Apostles in Australia.

PUFFINS

Puffins are sometimes called the 'parrots of the sea' because of their bright **beaks**!

These seabirds live mostly along the coastline on rocky cliffs and small islands.

Puffins are great swimmers. To catch their prey, they can dive 60 metres (196 feet) underwater and use their **webbed feet** to propel themselves after herring and other small fish.

Not only are they great swimmers, they are also very fast flyers! Flapping their wings as many as 400 times a minute allows them to reach speeds of 50 miles per hour (80 kilometres per hour).

YUMMY SEAWEED: SCENE 8

The material for this scene can be linked to curriculum topics, including:
Animals including humans; history; living things and their habitats.

Explore the history of edible seaweed with this scene showcasing just some of the kinds of food that seaweed can be used to make. Discuss why it is becoming more popular as an ingredient.

DISCUSSION PROMPTS

- **Have you ever eaten anything with seaweed in it?**

Encourage children to recall if they have eaten anything where seaweed was used as an ingredient and what it tasted like.

- **How long do you think humans have eaten seaweed for?**

Information overleaf

- **What kind of bird is looking through the window in this scene?**

Information overleaf

ACTIVITY

Corresponding activity on page 10 of the activity pack: 'Seaweed Snacks' is a spot the difference activity where children have to spot 11 differences between two versions of this scene.

YUMMY SEAWEED: SCENE 8

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

HOW LONG HAVE HUMANS BEEN EATING SEAWEED?

Humans eating seaweed is far from being a new concept.

Scientists think that seaweed of all categories – red, green, and brown – has been eaten by humans for as many as 8,000 years! It could have been a regular part of the diets of ancient people.

Hundreds of years later, however, eating seaweed became less common and something only really consumed when other sources of food were hard to come by.

Edible seaweed is become more popular again now, with **climate change** meaning that scientists are looking for more **sustainable** sources of food.

Over 140 different **species** of seaweed are eaten in the present day, mostly by countries in Asia.

GREAT GULLS

The bird in this scene is a type of gull called a herring gull.

There are over 40 different **species** of gull found all over the world. While they are seabirds and are associated with the coastline, some can be found quite a way **inland**.

They are also **scavengers**. Their diet mostly consists of fish, but they also eat anything else that they think looks tasty. This includes insects, shellfish, and a variety of **invertebrates**.

Some gulls are even known to try and steal human food!

PRODUCING OXYGEN: SCENE 9

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats; plants.

Discuss the process of photosynthesis with this spread which explains how seaweed helps to produce most of the air that we breathe! Explore how photosynthesis works and what other sea species produce a lot of oxygen.

DISCUSSION PROMPTS

- **What is photosynthesis?**
  Information overleaf

- **What other things in the ocean, apart from seaweed, help to produce oxygen?**
  Information overleaf

- **What kind of animal is the diver in the scene looking at?**
  Information overleaf

ACTIVITY

Corresponding activity on page 11 of the activity pack: 'Deep Dive' is an activity where children have to label the diver with the corresponding pieces of equipment.

PRODUCING OXYGEN: SCENE 9

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE POWER OF PHOTOSYNTHESIS

Photosynthesis is the process through which plants and similar **organisms**, like seaweed, produce their own food.

Seaweed absorbs water, sunlight, and a **gas** called **carbon dioxide** through its blades, which are the seaweed version of a plant's leaves.

It uses the energy in the sunlight to convert the water, light, and carbon dioxide into a type of sugar called glucose. It needs this glucose to grow!

This process also produces oxygen, which is released into the surrounding water and also into the **atmosphere**.

SUPER SEA SPECIES

Seaweed isn't the only thing in the ocean that produces oxygen through photosynthesis. Organisms called phytoplankton do too!

Also called microalgae, phytoplankton are mostly be found in the upper layers of the world's oceans where sunlight can reach.

They are so small that they can only be seen when under a **microscope**!

Not only do they create a lot of the oxygen that we need to survive, they are also a very important part of the **food chain**.

TERRIFIC TURTLES

As a group of animals, turtles are ancient – they lived alongside the dinosaurs tens of millions of years ago!

There are seven species of sea turtle. The biggest is called the leatherback turtle. This marine giant can grow up to 2.2 metres (7.2 feet) long!

Because they are **reptiles**, turtles can't breathe underwater but can hold their breath for up to two hours!

FRAGILE SEAWEED: SCENE 10

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats.

Discuss how fishermen and fisherwomen are working to protect seaweed with this scene about the dangers that seaweed faces from human activity. Explore the biggest fishing boat in the world and some of the issues surrounding it.

DISCUSSION PROMPTS

- **How do you think people working on fishing boats can protect seaweed?**
Encourage children to think about ways that fishermen and fisherwomen can work without damaging seaweed. There is also information overleaf.

- **How big do you think the biggest fishing boat in the world is?**
Information overleaf

ACTIVITY

Corresponding activity on page 12 of the activity pack: 'Bumpy Seas' is a word scramble and words within words activity where children must unscramble the boat-related words.

FRAGILE SEAWEED: SCENE 10

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

RESPONSIBLE FISHING

Because seaweed is so important to humans and to the natural world, it's very important that it is not damaged by human activity like fishing.

One way that this can be avoided is through scientists marking out areas where places like kelp forests are growing so that fishing boats know to avoid them.

Another way is by using smaller fishing boats. Large boats need big engines to power them, which often release lots of **greenhouse gases** into the **atmosphere**. Small boats, on the other hand, don't need as much fuel and are mostly better for the **environment**.

Fishermen and fisherwomen can help the environment in other ways too. Some **species** of fish have limits on how many can be caught each year, to make sure that their numbers don't get too low and that they can continue to thrive!

ANNELIES ILLENA

The largest fishing **vessel** in the world is called the *Annelies Illena*.

It is 144 metres (472 feet) long and needs 63 members of crew onboard to run!

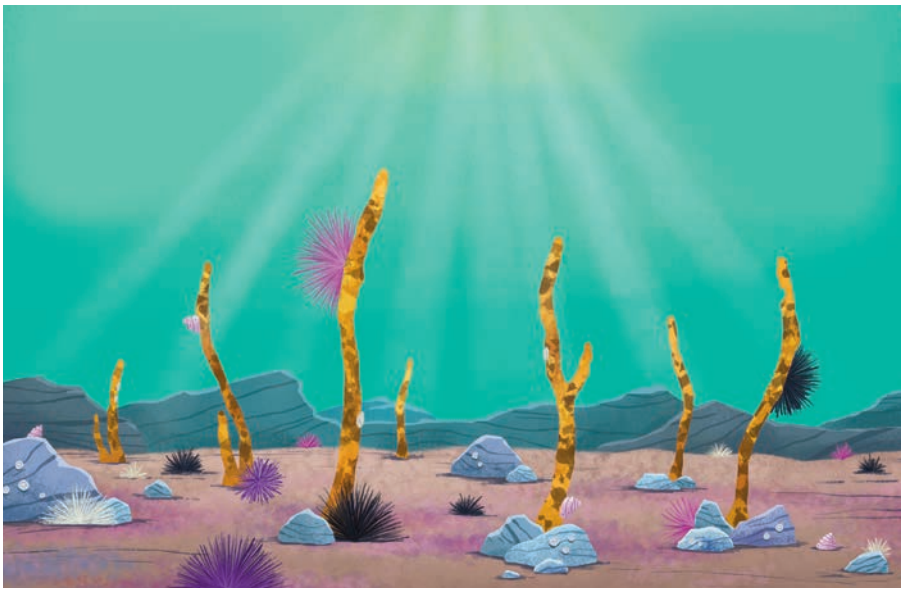
It is a type of fishing vessel called a trawler, meaning that it drags huge nets through the water and across the seabed.

Some scientists disagree with the size of the *Annelies Illena* and believe that it has the ability to cause a lot of damage to the marine **ecosystem**.

THE THREAT OF CLIMATE CHANGE: SCENE 11

The material for this scene can be linked to curriculum topics, including:
Animals including humans; Earth and space; living things and their habitats.

Discuss the difference between the climate and the weather with this scene about the dangers that climate change poses to seaweed. Explore alternative ways of producing energy that can help us look after the environment.



DISCUSSION PROMPTS

- **What is the difference between the climate and the weather?**
  Information overleaf

- **Can you think of ways of producing energy that are good for the environment?**
  Information overleaf

ACTIVITY

Corresponding activity on page 13 of the activity pack: 'Extreme Weather' is a classic fill in the blanks activity where children fill in the blanks in a series of sentences and facts about different kinds of extreme weather.

THE THREAT OF CLIMATE CHANGE: SCENE 11

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

CLIMATE CHANGE AND GLOBAL WARMING

Although they may seem like the same thing, there is a difference between the **climate** and the **weather**.

The weather changes from one day to another, whereas the climate is the pattern of weather conditions over a long period of time.

Earth's climate can change naturally over time, but scientists have noticed that it has been changing quicker than normal over the last few hundred years.

Humans burning **fossil fuels** has contributed to this change.

Fossil fuels release harmful **gases** like **carbon dioxide**, which get trapped in the **atmosphere** and heat the planet up.

RENEWABLE ENERGY

Clever scientists have invented several ways of producing energy and electricity that don't involve burning fossil fuels.

These energy sources are **renewable**, meaning that as well as being better for the environment, they will never run out!

Examples of these energy sources include:

- **Solar power** – energy produced using heat from the Sun.
- **Water power** – energy produced by fast-flowing water and waves.
- **Wind power** – energy produced using the wind.

SEAWEED FARMING: SCENE 12

The material for this scene can be linked to curriculum topics, including:
Animals including humans; living things and their habitats.

Explore seaweed farming and the role it could play in helping to tackle climate change. Think like a scientist to discuss its benefits and drawbacks.

DISCUSSION PROMPTS

- **Do you think seaweed farming is a good idea?**

Encourage children to think about the positives and negatives of seaweed farming.

- **What are the positives and negatives of seaweed farming?**

Information overleaf

ACTIVITY

Corresponding activity on page 14 of the activity pack: 'Going Fishing' is a line maze activity where children have to complete the maze to help the fisherman find their way to their boat.

SEAWEED FARMING: SCENE 12

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

SEAWEED FARMING - POSITIVES AND NEGATIVES

Although scientists think that seaweed could be very useful in helping to tackle **climate change**, there is still a lot to research to be done about it first!

As a concept, it has both positives and negatives that scientists need to weigh up.

The positives:

- Through soaking up **carbon dioxide**, seaweed could potentially reduce the amount of the gas that gets trapped in our **atmosphere**.
- Seaweed naturally grows very quickly and doesn't need any **artificial fertilisers** that could **pollute** the water.
- As well as potentially helping to clean the atmosphere, scientists already know that seaweed helps to **purify** the water.

The negatives:

- Some scientists are concerned about the possibility of animals getting tangled in the ropes used to create seaweed farms.
- Having a lot of seaweed growing in one place can reduce the amount of sunlight that reaches the seafloor. This would affect organisms such as seagrass which, like seaweed, need sunlight to grow.
- Artifically increasing the amount of seaweed in a particular area could throw the balance of the **ecosystem** off, damaging important **habitats** like coral reefs.

NATURE'S UNSUNG HERO: SCENE 13

The material for this scene can be linked to curriculum topics, including:
Animals including humans; Earth and space; living things and their habitats.

Discuss different ways of looking after the environment that can be done from home. Explore what happens when a planet experiences a runaway greenhouse effect.

DISCUSSION PROMPTS

- **How do you think we can protect seaweed and the oceans?**
  Information overleaf

- **What is the greenhouse effect?**
  Information overleaf

ACTIVITY

Corresponding activity on page 15 of the activity pack: 'Super Seaweed' is a reflective writing activity where children answer questions about their opinions on a number of seaweed-related questions.

NATURE'S UNSUNG HERO: SCENE 13

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

LOOKING AFTER THE PLANET

It's not just scientists like phycologists who can do things to protect Earth. We can all help out! Things that we can do include:

- Using less water – like turning the tap off when we brush our teeth.
- **Recycling** items so that they can be used again.
- Turning off lights and electronic appliances when we aren't using them.
- Walking, cycling, and using public transport like trains and buses instead of cars.
- Pick up litter if you see it on the ground.

GREENHOUSE EFFECT

The greenhouse effect is the process through which certain **gases** get trapped within Earth's **atmosphere** rather than being released into space.

Over time, this makes Earth a lot warmer than it would otherwise be.

Scientists have studied the planet Venus to see what happens when the greenhouse effect gets out of control over a very long period of time.

Sometimes called Earth's twin, Venus is roughly the same size as our planet. However, its surface temperature is 460 °C (860 °F)!

Venus's atmosphere is mainly made of **carbon dioxide**, which is a greenhouse gas. It has heated surface up to the point where scientists don't think life could ever exist there.

POST-READING QUESTIONS

Engage in discussion about the journey taken throughout the book and the facts that were uncovered, with the suggested questions below.

- **Were you surprised to learn that we can't survive without seaweed?**
- **Did anything else in the book surprise you?**
- **What's the coolest thing you've learnt from this book?**

ACTIVITY

Corresponding activity on page 16 of the activity pack: 'Write Your Own Phycology Story' is a creative writing activity which encourages children to write a story about phycology, using three key prompt words.

DISCLAIMER:

Every effort has been made to ensure the information in this booklet is correct as of the time of publication, Autumn 2025.

THE BIG QUESTIONS ANSWERED

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