

Food chains & ecosystems

Self-guided learning

This guide provides you with information linked to key displays throughout SEA LIFE London Aquarium that can be used to explore food chains & ecosystems during your visit. By drawing out the points included in this guide you will be able to introduce or recap on the key learning outcomes and provide pupils with a fantastic real life context for learning.

Workshops

Workshops to consolidate this learning are also available. Further details about workshops can be found on our website or by speaking to our team before your visit.

Other topics in this series:

- Behaviour
- Habitats & Adaptations
- Conservation

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Learning objectives

By completing this tour pupils will:

- Understand the terms 'food chain' and 'ecosystem'.
- Learn that animals perform different roles in their specific ecosystems.
- Understand that animals and plants need to remain balanced in their ecosystem and that imbalances can cause problems for all connected organisms.
- Be able to identify the sequence of organisms in the rockpool food chain.



Introduction



Use the questions on this page to introduce the topic to pupils before starting your tour.

Questions:

What is an ecosystem?

An ecosystem is a group of living things that can all be found in one area.

What types of living things could make up an ecosystem?

An ecosystem is made up of a mixture of plants and animals. These plants and animals normally rely on each other for food, protection or both. If one of the plants or animals starts to die out then this will affect all of the other living things that make up that ecosystem.

During our tour we are going to learn more about the way certain marine creatures depend on each other.

What is a food chain?

A food chain is a way of describing who eats who in a certain environment. For example small insects are eaten by frogs and then frogs are eaten by snakes. Food chains are linked to ecosystems because all the animals have to be found in the same area to interact with each other.

So now we understand a bit more about ecosystems and food chains we can start our trip around the SEA LIFE London Aquarium and have a closer look at the different ecosystems in the displays.

Remember to hand out exploration sheets to each pupil - these will be needed for activities on the tour.



Teacher's map



Activities

Shark Reef Encounter

- Feeding time:

14.30

Rockpool

- **Rockpool food chain** pupil activity
- **Rockpool** discussion notes (p4)

Nemo's Coral Caves

- **Colourful clownfish** pupil activity
- **Clownfish** discussion notes (p5)
- Feeding time:

15.30

Ray Lagoon

- **Which Ray?** pupil activity
- **Rays** discussion notes (p6)
- Feeding time:

11.30

Rainforests of the World

- Feeding times:

12.30 16.30

Ocean Tunnel

- **What's for dinner?** pupil activity
- **Sea turtle** discussion notes (p8)
- **Seven senses** pupil activity
- **Sharks** discussion notes (p9)

For more information on feeding times please check at the admissions desk on arrival.

ROCKPOOL

Visit Area: ROCKPOOL

Rockpools are very difficult places for creatures to survive - with huge waves, strong currents, changing water temperatures, harsh sunlight and lots of predators! Creatures commonly found in this habitat include starfish, anemone, crabs, sea toads and grey mullet.



Questions:

Looking at the rockpool ecosystem, which creature is most common?

The most common creature is actually one we can't see without a microscope – plankton. Plankton is made up of the smallest animals and plants in the sea and floats around wherever the current takes it!

Why is something as tiny as plankton so important to the food chain?

Plankton is very important to the food chain because it can turn sunlight into chemical energy (in a process called photosynthesis). Because of this, plankton is known as a primary producer.

What do you think eats plankton?

Mussels eat plankton. They feed by opening their shell a little, sucking in water, filtering out the tiny plankton and then releasing the water again. Their tough shells help mussels to protect themselves from predators, but that doesn't stop all creatures from managing to eat them!

Which animal in the rockpool do you think likes to eat mussels?

Starfish eat mussels and they do it in an unbelievable way! The starfish uses the suckers under its arms to pull open the mussel's shell. Then it pushes its stomach inside and covers the mussel until it dissolves. If the mussel is diseased or poisonous the starfish can detach its stomach and grow a new one!

What do you think would happen to this ecosystem if all the mussels were removed?

Without mussels in the food chain starfish wouldn't have enough food to survive. If the starfish started to die out this would also affect the amount of food available to the crab. So we can see that each creature in the food chain is crucial to the survival of the whole ecosystem.

FACT
If the Sea Anemone is not eaten or destroyed it can live for decades.



Activity: Rockpool food chain

Ask pupils to put the rockpool food chain in the correct order on their exploration sheet. Pupils can then touch creatures under the guidance of a SEA LIFE London Aquarium expert.

PROTECT

You can help!

We should always take our litter home after we've visited the beach. We should also be respectful of any animals we might find in a rockpool and make sure that they are never disturbed.



CLOWNFISH

Visit Area: NEMO'S CORAL CAVES

Clownfish live on sheltered coral reefs found in the warm tropical waters of the Indian and Pacific Oceans. Within their habitat they find a very unusual place to hide - amongst the poisonous tentacles of sea anemones!



Questions:

What do clownfish eat?

Clownfish aren't fussy eaters, they are what's known as omnivores which means that they will happily eat meat and plants.

Why would a clownfish choose to live amongst an anemone's tentacles?

As a small fish clownfish are low down the food chain, meaning there are lots of predators who want to eat them. By hiding in the anemone's poisonous tentacles they have added protection from predators.

What do you think the anemone gets from this relationship?

Clownfish eat the harmful algae and parasites from the anemone's tentacles, helping it to stay healthy.

Some people have even suggested the bright orange colour of clownfish helps attract other fish towards the anemone – providing it with a meal in return!

The two animals depend on each other, so what do you think would happen to the clownfish if the number of anemones went down?

If the number of anemones went down then the number of clownfish would go down too as they would have less food and protection.

FACT

All clownfish are born male!

FACT

If a female dies, a male clownfish in the group can change sex to take her place.



Activity: Colourful clownfish

It is believed that the bright orange and white colours of the clownfish attract prey towards the anemone. Ask pupils to draw the patterns of two different clownfish they see onto their exploration sheet.

PROTECT

You can help!

Don't touch anything if you go snorkelling and never buy products made from coral or other marine creatures.



RAYS

Visit Area: RAY LAGOON

Rays are strange flat looking creatures that use their wings to glide through the ocean. They live in oceans and seas all over the world, mostly on or near the seabed. Some species choose a habitat close to the shore, whilst others live over 3,000 metres beneath the surface in the deep ocean!



Questions:

Rays are known as 'consumers', meaning that they can't produce their own food. So what do you think they eat?

Blonde, Thornback and Spotted rays all like to eat small bony fish, squid and crustaceans. Other larger species of ray like the Manta Ray are what's known as 'filter feeders'. This means that they swallow lots of water and then filter out tiny fish and plants known as plankton.

How high up the food chain do you think rays are?

Even the largest species of ray, the Manta Ray, has predators above it in the food chain. Rays are commonly eaten by active predators like the Hammerhead Shark, Great White Shark and Killer Whale.

How do you think the flat shape of rays can help them catch food?

Most rays use their flat bodies to float close to the

sea floor. This means that they can suck their food off the ground. Their flat shape also helps them to avoid predators by burying themselves in the sand.

How do you think the colour of their skin helps them to survive in their habitat?

The brown and olive colouring on their skin helps to camouflage them once they settle on the ground. This makes them invisible to predators.

Do you think rays always use their eyes to hunt?

Scientists don't think so. Rays use special sensors called ampullae of Lorenzini, which can detect the tiny electrical charges given off by their prey.

FACT
Rays are a member of the shark family.

FACT
A Manta Ray can weigh up to 1,300kg. That's the same as a young elephant!



Activity: Which ray?

Ask pupils to look at the information boards around the display and try to identify the different species of rays. Discuss how they differ. There are 5 in total – Spotted, Painted, Thornback, Blonde & Undulate.

PROTECT

You can help!

We can help by supporting campaigns to set-up Marine Conservation Zones across the globe. Try to avoid eating skate as it's an endangered species of ray.



JELLYFISH

Visit Area: TIDAL REACH

Jellyfish are not actually fish - they have no blood, no heart and no brain. In fact, a jellyfish's body is 95% water. Species can be found in every ocean with some living in deep water and others preferring very shallow water.



Questions:

Why are jellyfish so important to many ecosystems?

Lots of animals eat jellyfish, making them an important part of the food chains in many different ecosystems. The Leatherback Sea Turtle survives nearly entirely on jellyfish.

But what do you think jellyfish eat?

Jellyfish can eat small fish and crustaceans but mostly they eat plankton - tiny plants and animals which drift through the water. They use their long, poisonous tentacles to catch and kill their prey.

If the conditions are right jellyfish can reproduce very quickly, leading to huge groups in one area. Why might this be a problem?

Like all animals jellyfish live in careful balance with the others in their ecosystem. Too many jellyfish all feeding at once may mean there is less plankton available for the other creatures that rely on it.

Jellyfish also eat fish eggs so if more are being eaten there is a greater risk that fewer fish will hatch.

Do you think jellyfish pose a danger to humans?

Most jellyfish have very mild stings which are harmless. But some, like the Box Jellyfish from the waters around Australia, have a sting so strong that it can be fatal to humans that come into contact with it!

FACT

There are about 200 species of jellyfish.

FACT

Jellyfish have existed for 650 million years!

FACT

A jellyfish uses its oral arms to sweep food into its mouth.



Activity: Jellyfish anagrams

Ask pupils to solve the clues and unscramble the words describing how a jellyfish catches and eats its prey. The correct answers are 1. Tentacles 2. Oral arms 3. Mouth.

PROTECT

You can help!

We can help by supporting campaigns to set-up Marine Conservation Zones across the globe.



SEA TURTLES

Visit Area: **OCEAN TUNNEL**

Sea turtles have existed for around 215 million years, making them one of the oldest surviving species on Earth! Dinosaurs still ruled the Earth when the first sea turtles evolved. There are 7 different species of sea turtle, each with a body that is especially suited to their diet and habitat.



Questions:

The Hawksbill Turtle has a very narrow sharp beak - does anyone know what it uses this for?

It uses it to search in the gaps of coral reef for its favourite food – sponges. These aren't the sponges that you'll find in your bathroom at home though; they are animals that grow on coral reefs.

Sponges multiply very quickly, threatening the health of coral reefs. How do Hawksbill Turtles help prevent this?

Hawksbill Turtles can eat over 500kg of sponges each year, helping to prevent them from spreading over coral reefs. That's more food than each of us eat in 3 years!

Green Sea Turtles also play an important role in keeping coral reefs healthy. Do you know how their saw-like beak helps?

Adult Green Sea Turtles are herbivores (plant eaters) so use their beaks to scrape algae off of the coral to eat. Their favourite food is seagrass.

Loggerhead Turtles have the greatest number of prey of all the sea turtles. Do you think they like to eat plants or meat?

They actually eat both, making them an omnivore. Although they don't have teeth, their strong jaws help them to crush harder food like shellfish and sea urchins.

FACT

The largest sea turtle is the Leatherback. It can weigh over 900 kg!

FACT

Green Sea Turtles can stay underwater for up to 5 hours.



Activity: What's for dinner?

Ask pupils to match the different sea turtles to their favourite food on their exploration sheet. Answers: Loggerhead – mussels, Green Sea Turtle – algae, Leatherback – jellyfish, Hawksbill – sponges.

PROTECT

You can help!

Sea turtles often mistake plastic bags floating in the sea for jellyfish. Thousands die every year choking on these plastic bags. It's very important we use a 'bag for life' not a plastic bag.



SHARKS

Visit Area: **OCEAN TUNNEL**

There are over 350 species of shark in the world, living in all kinds of different habitats from warm tropical waters to icy polar seas. Some live in the deep, dark waters of the ocean, while others prefer sunlit waters close to the surface.



Questions:

The gigantic Whale Shark can grow up to 14 metres long! That's about the same length as a large double decker bus! What do you think a shark as big as this eats?

Bizarrely this shark eats the oceans smallest animals – plankton (tiny animals and plants that float around in the ocean). Whale Sharks swallow lots of water and then filter all the plankton out before the water passes out through slits on their side called gills.

The Blacktip Reef Shark prefers shallow coastal waters to the deep ocean. What do you think they prefer to eat?

Blacktip Reef Sharks like small bony fish, squid and octopus. Lots of people are scared of sharks attacking them, but only Great White, Bull and Sand Tiger Sharks can be considered actively dangerous. Even attacks by these species are generally thought to be cases of mistaking humans for more common prey like seals.

Where do you think most sharks appear on the food chain?

Most sharks are 'apex predators'. This means that they are at the top of the food chain so they don't have to worry about being eaten by other animals. But believe it or not, even sharks have predators in some waters – like Killer Whales!

Humans have 5 senses - sight, smell, hearing, touch and taste. How many senses does a shark have?

A shark has 7 senses. The small freckles on the end of its nose are called the ampullae of Lorenzini and allow the shark to sense the electrical currents given off by other animals. Like most fish, sharks also have something called a lateral line that helps them detect movement in the water.

FACT

Great White Sharks eat 11 tons of food a year. That's roughly the same weight as a bus!



Activity: Seven senses

Sharks are incredible hunters. Their sense of smell is 10,000 times better than a human's and their other senses are pretty amazing as well. Ask pupils to link each sense to the relevant organ on their exploration sheet.

PROTECT

You can help!

We can help sharks by supporting campaigns to set-up Marine Conservation Zones across the globe. We should also never buy products made from sharks or eat shark fin soup.



Find out about food chains & ecosystems

Rockpool food chain

Can you place the animals below into the correct order in the food chain?

Who is top of the rockpool food chain?

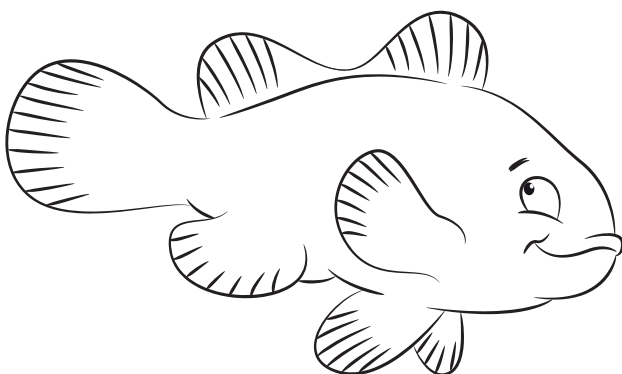


<p> Mussels</p> <p> Sun</p> <p> Plankton</p> <p> Crab</p> <p> Starfish</p>	<p>START - Bottom of food chain</p>	
<p>END - Top of food chain</p>		

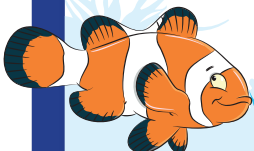
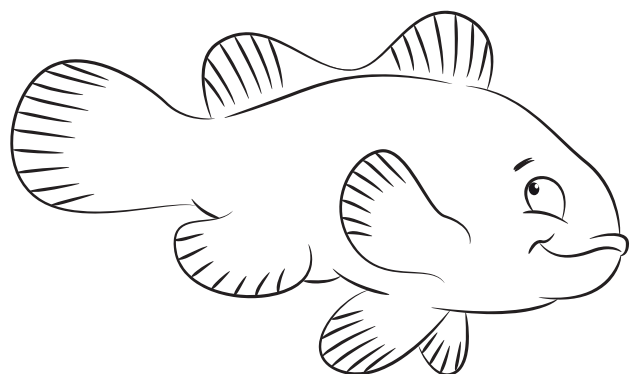
Colourful clownfish

Draw the patterns you see on two different clownfish during your visit.

1



2



My bright colours attract prey to the anemone.

Find out about food chains & ecosystems

Which ray?

Write down the names of the ray species you found in Ray Lagoon.



Which of my friends did you see?

Jellyfish anagrams

Unscramble these words about how jellyfish eat.

1. Jellyfish sting prey with their:



2. They gather up plankton using their:

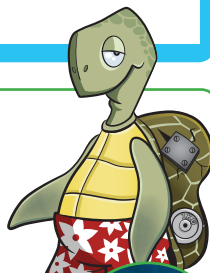


3. Food they catch is put into their:



What's for dinner?

Look at the heads of these different turtles and connect them to what they like to eat.



Loggerhead

A huge head with powerful jaws for crushing food.



Jellyfish



Green Sea Turtle

A saw-like beak for scraping food from coral and rocks.



Coral covered in algae



Leatherback

A sharp beak for catching and piercing food.



Mussels



Hawksbill

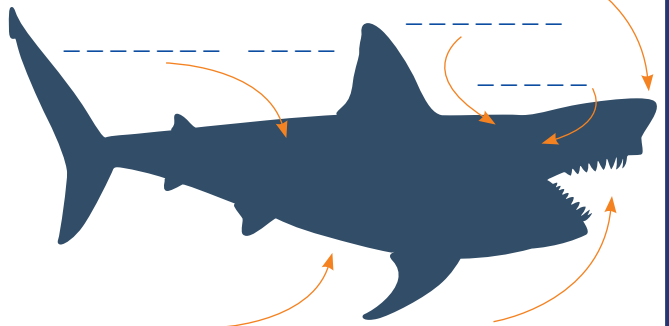
A narrow head and long beak for finding food in small gaps.



Sponges

Seven senses

Sharks have 7 senses!



Try and match each of the shark's 7 senses to the right part of its body. Some are more difficult than others!

- Sight
- Taste
- Ampullae of Lorenzini
- Touch
- Smell
- Hearing
- Lateral line