SeaScapes
Tyne to Tees, shores and seas

Food-chains
Learning Resources

Learning Outcomes

Year 1

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

Identify and name a variety of common animals that are carnivores, herbivores and omnivores.

Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).

Year 2

Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).

Explore and compare differences between living, dead and never been alive.

Identify that most living things live in habitats to which they are suited.

Identify and name a variety of plants and animals in their habitats.

Describe how animals obtain their food from plants and other animals using a simple food chain.

Year 3

Identify that animals, including humans, need the right type and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.

Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Year 4

Recognise that living things can be grouped in a variety of ways.

Recognise that environments can change and that this can sometimes pose dangers to living things.

Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

Construct and interpret a variety of food chains, identifying producers, predators and prey.

Year 6

Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.

Give reasons for classifying plants and animals based on specific characteristics.

Describe the ways in which nutrients and water are transported within animals, including humans.

Recognise that organisms have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Activity 1 - Food chains

Gameplay overview:

Children select from a range of shore species bean bags or cards and try to establish a food chain comprising producer,primary consumer, secondary consumer and tertiary consumer.

Children select from a range of shore species bean bags or cards and try to establish a food chain comprising producer, primary consumer, secondary Consumer, tertiary consumer.

The bean bags and cards have an image on one side and a brief bit of information on the reverse.

Colour coded circles on the image side of the bean bags and cards denote whether the species is a producer or a primary, secondary or tertiary consumer.

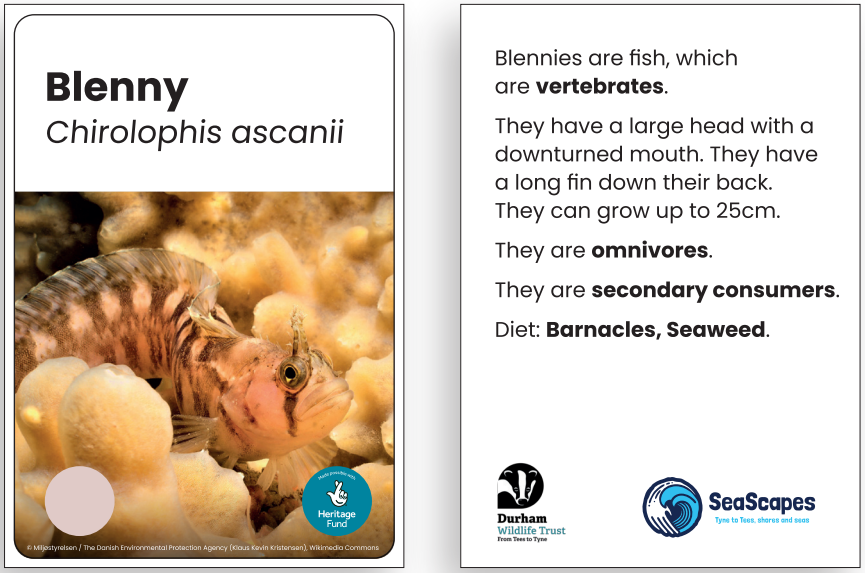
More in-depth information about the key features of species is listed in the table in appendix A.

This resource allows you to facilitate discussions around food chains. It might also help older children (UKS2) explore possible extensions to their food chains – for example, can there be more than one tertiary consumer?

KS1 activities will anticipate basic short food-chains.

LKS2 activities will discuss more complex food chains of 3 or more species.

UKS2 activities will discuss variations in primary and secondary consumers and possible complications to tertiary consumers – for example porpoises being predated on by dolphins.



Activity 2 - Food webs

Gameplay overview:

An alternative game to play with the bean bags (or cards) is to create more complex food webs involving producers, primary, secondary and tertiary consumers.

In this game, use of the bean bags or cards is augmented by using lengths of garden string (which is easy to break into separate lengths without the need for scissors) to create food webs.

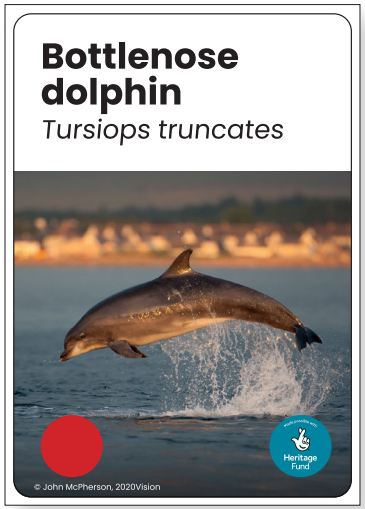
Order of play:

01 Start by inviting the children to randomly pick a bean bag and then sit down in a circle.

02 Taking turns, each child who has a producer species bean bag or card takes hold of one end of a piece of pre-cut string, passing the other end to someone they think holds a primary consumer bean bag or card.

03 Again, taking it in turns, the primary consumers look for suitable secondary consumers to whom they can pass the end of the string. this turn taking continues until the string reaches a tertiary consumer (apex predator), completing the web.

04 At each stage where the string is passed on it is important that children keep hold of a section of the string so that ultimately they are able to form a food web linking each child.



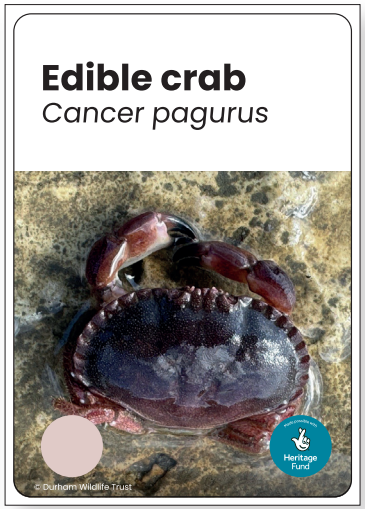
Bottlenose dolphins are **mammals.** They are **vertebrates**.

Dolphins use echolocation to find their food. They use their teeth to grasp prey then swallow it whole.

They are **carnivores**.

They are **tertiary consumers**.

Diet: **Crustaceans, Fish, Prawns, Squid**.



Edible crabs are **crustaceans**, which means they are **invertebrates**.

Their hard **exoskeleton** or **carapace** can be up to 25cm. The edge of the shell looks like a pie crust. The tips of the claws are black.

They are **nocturnal**.

They are **carnivores**.

They are **secondary consumers**.

Diet: **Molluscs, Crustaceans**.

Activity 3 – Who am I?

Order of play:

01 Children take a bean bag or card without looking at it.

02 The teacher or facilitator places the card where the rest of the children can see it, but the child who selected the card cannot.

03 The child who selected the card is the 'guesser' and it is their role to ask the other children questions which will reveal the identity of the creature on the bean bag or card.

04 The guesser will be encouraged to ask classification type questions (e.g. Am I an invertebrate? Do I have legs? Am I a herbivore?). The other children are only able to give yes / no type answers.

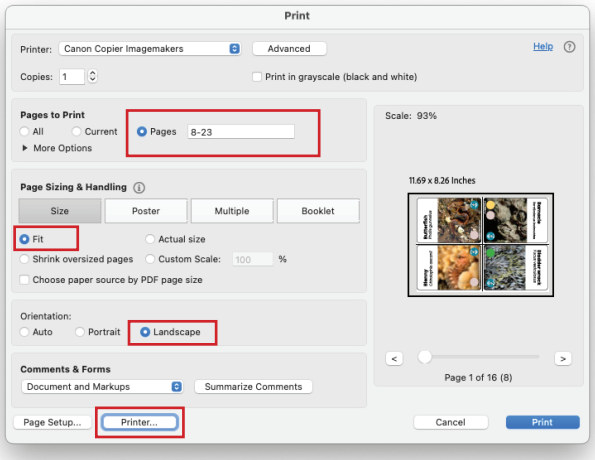
05 The difficulty of this game might be varied by selecting varying quantities of bean bags or cards, and perhaps discussing these as a group prior to beginning the challenge.

Bean bag / card species

Producers	Primary Consumer	Secondary Consumer	Tertiary Consumer
Sea lettuce	Zooplankton	Zooplankton	Lesser spotted cat shark
Phytoplankton	Chiton	Chiton	Octopus
Bladder wrack	Limpet	Shore crab	Fin whale
Serrated wrack	Barnacle	Barnacle	Bottlenose dolphin
Oarweed	Flat periwinkle	Prawn	Oystercatcher
Gutweed	Lugworm	Lugworm	Grey seal
Laver		Hermit crab	Orca
Detritus - decomposer		Blenny	
		Butterfish	
		Dog whelk	
		Beadlet anemone	
		Sea star	
		Herring	
		Sand eel	
		Edible crab	

Printing instructions

Follow these instructions when printing the game cards to make sure the correct information appears on the reverse of the game cards.



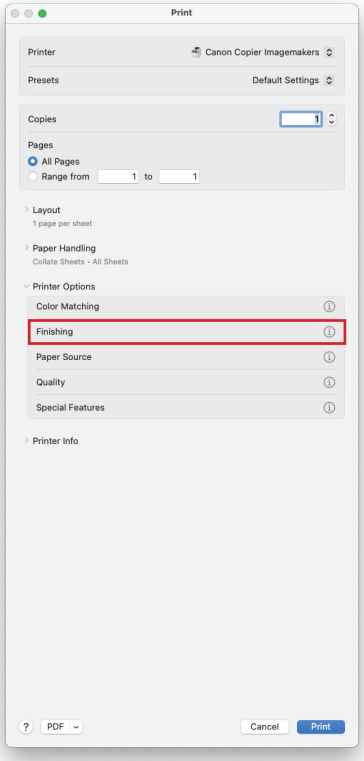
Open the print window (File/Print)

Select ‘Pages’ and enter 8-23

Select ‘Fit’ in Page Sizing

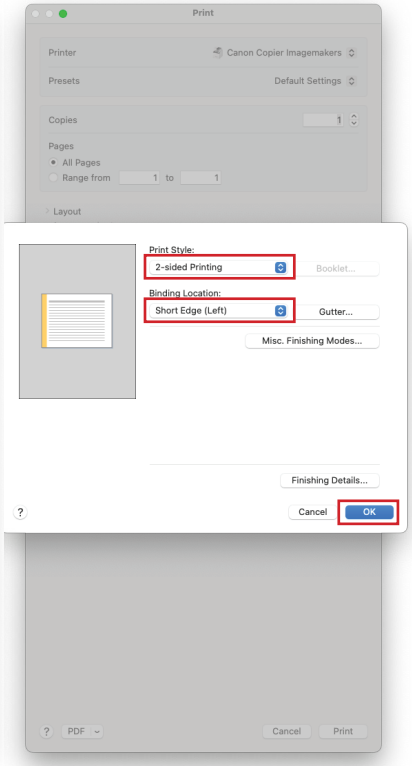
Select ‘Landscape’ in Page Orientation

Press ‘Printer...’



Select ‘Printer Options’

Select ‘Finishing’



Set ‘Print style’ to 2-sided Printing

Set ‘Binding Location’ to Short Edge (Left)

Press ‘OK’ and the ‘Print’

2-sided printing

01 Print the front page(s)

02 Remove the ejected paper. Turn it over lengthways.

03 Load the paper with the short edge first, and then click [resume] on screen.

Barnacle

Semibalanus balanoides

© Durham Wildlife Trust

Bladder wrack

Fucus vesiculosus

© Thérèse Gaige, Wikimedia Commons

© Jack Sewell, Wikimedia Commons

Butterfish

Pholis gunnelus

© Miljøstyrelsen / The Danish Environmental Protection Agency (Klaus Kevin Kristensen), Wikimedia Commons

Blenny

Chirolophis ascanii

Butterfish (also called Rock gunnel) are fish, which are **vertebrates**.

They have a flattened body like an eel, thick fleshy lips and a black stripe through their eyes. They are named butterfish because of their slimy skin. They can grow up to 25cm.

They are **carnivores**.

They are **secondary consumers**.

Diet: **Crustaceans, Worms, Fish eggs**.

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Blennies are fish, which are **vertebrates**.

They have a large head with a downturned mouth. They have a long fin down their back. They can grow up to 25cm.

They are **omnivores**.

They are **secondary consumers**.

Diet: **Barnacles, Seaweed**.

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Bladder wrack is a brown **seaweed**.

It grows between the high and low water mark on a rocky shore.

It has round **air bladders** which allow the seaweed to float upright underwater. This helps it to **photosynthesise**.

It is a **producer**.

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Barnacles are **crustaceans** related to crabs and lobsters. They are **invertebrates**.

Acorn barnacles are usually grey-white in colour and cone-shaped. Their body is inside the shell, upside down, with their legs at the top.

They are **omnivores**.

They are **primary** and **secondary consumers**.

Diet: **Phytoplankton, Zooplankton**.

Catshark

Scyliorhinus canicular

© Hans Hillerwaert, Wikimedia Commons

Chiton

Lepidochitonia cinerea

© Durham Wildlife Trust

© Durham Wildlife Trust

Nucella lapillus

Dog whelk

© Rosser1954, Wikimedia Commons

Detritus

The Dog whelks are **molluscs** – a type of **invertebrate**. Their spiral shells have 6 ridged bands and come in many different colours.

Dog whelks are **carnivores**.

They are **secondary consumers**.

Diet: **Barnacles, Limpets**.

Detritus is dead **organic** material - plants and animals that were once alive and their waste products.

It is eaten by **detritivores**, such as sand hoppers, worms and crabs.

It is broken down by a **decomposer** like bacteria into water, CO2 and nutrients.

Chitons are **molluscs**.
This means that they are **invertebrates**.

They have a soft body, no spine and are covered with a shell. They move slowly across rocks in search of food.

They are **primary** and **secondary consumers**.

Diet: **Seaweed, Barnacles.**

Catsharks are fish. Like all sharks, they have a **cartilage** skeleton and are **vertebrates**.

They have a blunt head with a rounded snout. They grow to 75cm long. They lay eggs in egg cases known as mermaid's purses.

They are **carnivores** and are bottom feeders.

They are **tertiary consumers**.

Diet: **Octopus, Crabs, Worms, Small fish.**

Bottlenose dolphin

Tursiops truncates

Edible crab

Cancer pagurus

Fin whale

Balaenoptera physalus

Flat periwinkle

Littorina obtusata

Periwinkles are **molluscs**. This means that they are **invertebrates**.

They have a soft body, no spine and are covered by a shell. They are found on the shore amongst seaweed.

They are **herbivores**.

They are **primary consumers**.

Diet: **Bladder wrack, Serrated or Toothed wrack.**

Fin whales are **mammals**. They are **vertebrates**.

Their torpedo-shaped bodies allow them to swim at speeds of up to 40km per hour. They are the second largest animal on earth.

They are **carnivores**. They filter food from mouthfulls of water.

They are **tertiary consumers**.

Diet: **Herring, Zooplankton, Squid**.

Edible crabs are **crustaceans**, which means they are **invertebrates**.

Their hard **exoskeleton** or **carapace** can be up to 25cm. The edge of the shell looks like a pie crust. The tips of the claws are black.

They are **nocturnal**.

They are **carnivores**.

They are **secondary consumers**.

Diet: **Molluscs, Crustaceans**.

Bottlenose dolphins are **mammals**. They are **vertebrates**.

Dolphins use echolocation to find their food. They use their teeth to grasp prey then swallow it whole.

They are **carnivores**.

They are **tertiary consumers**.

Diet: **Crustaceans, Fish, Prawns, Squid**.

Gutweed
Ulva intestinalis

© W Carter, Wikimedia Commons

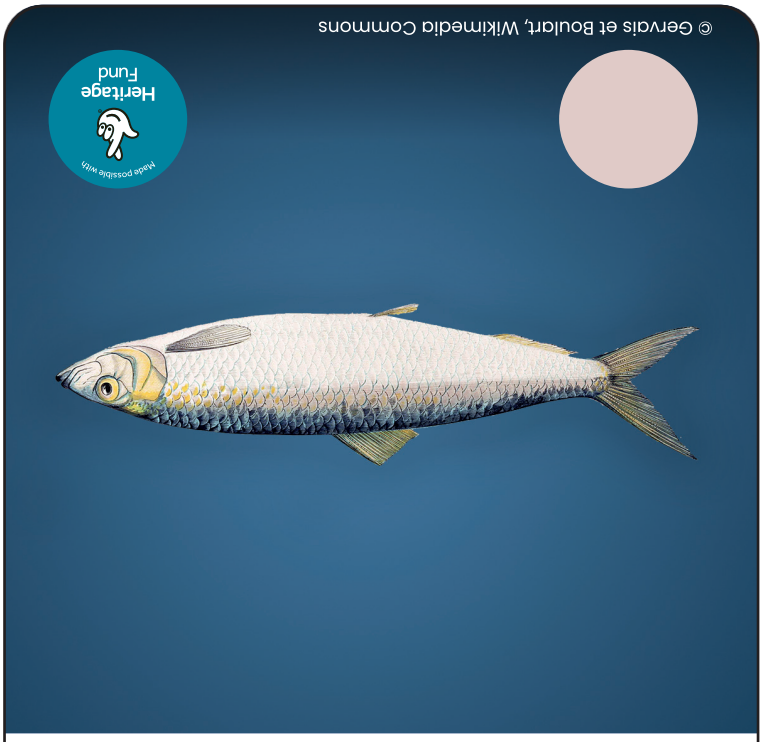
Hermit crab
Pagurus bernhardus

© Durham Wildlife Trust

© Durham Wildlife Trust

Laver
Porphyra spp

© Gervais et Boulart, Wikimedia Commons



Herring
Clupea harengus

Laver is a red **seaweed.**

It is found on rocky shores.

It attaches to the rock with a disc-like **holdfast**. The purple **fronds** are thin and **membrane** like.

It is a **producer**.

Herrings are **fish**. This means they are **vertebrates**.

Herrings move around in large groups known as schools. They may grow to 45cm.

They are **carnivores**.

They are **secondary consumers**.

Diet: **Zooplankton**.

Hermit crabs are **crustaceans**. They have a soft **exoskeleton**, which they protect by living inside empty sea snail shells.

They are **omnivores**.

They are **secondary consumers**.

Diet: **Prawns, Small fish, Seaweeds**.

Gutweed is a mass of bright green tubes, filled with air to make it float upright underwater, which helps it to **photosynthesise**.

It is a **producer**.

Gutweed is a **seaweed**.

It is found in rock pools, sand, mud and attached to shells and other seaweeds.

Limpet

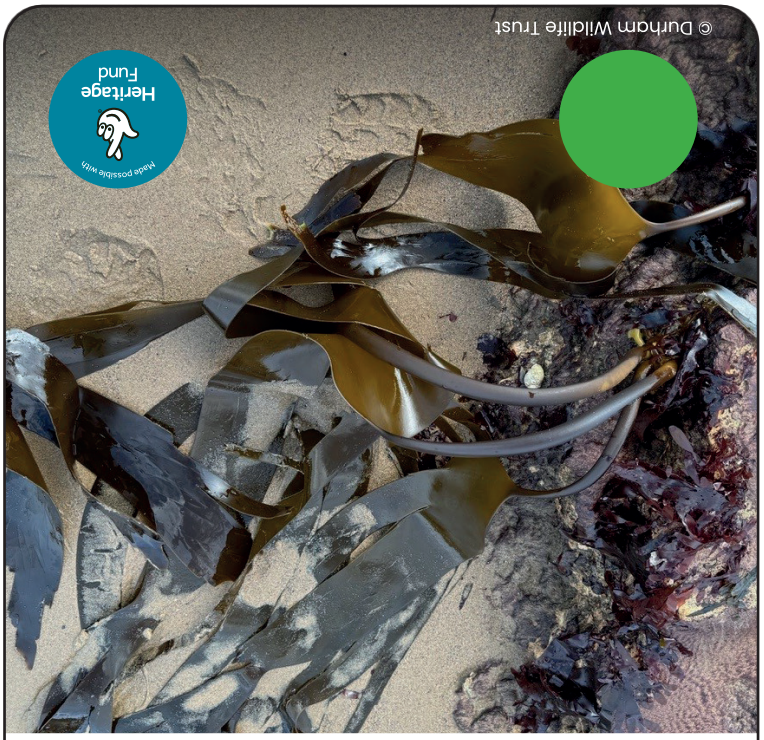
Patella vulgata

Lugworms

Arenicola marina

Octopus

Eledone cirrhosa



Oarweed

Laminaria digitata

Octopuses are **molluscs**. This means they are **invertebrates**.

They have soft bodies, bulbous heads, large eyes and 8 arms. They can change their colour and skin texture to blend in with their environment for camouflage. They are bottom feeders.

They are **carnivores**. They are **tertiary consumers**.

Diet: **Crustaceans, Fish, Molluscs, Sea stars**.

Oarweed is a brown kelp **seaweed.**

It is often seen floating on the surface in the shallow seas around the coast.

Oarweed **fronds** are flat and split into fingerlike sections, resembling a hand. It attaches to the rock using tough root like **holdfasts**.

It is a **producer**.

Lugworms live in U-shaped burrows in the sand. They are **invertebrates**.

They can vary from black or brown to pink or green. The coiled casts at the end of their burrows can be seen at low tide.

Lugworms are **omnivores**.

They are **primary** and **secondary consumers**.

Diet: **Detritus, Zooplankton**.

Limpets are **molluscs**. This means that they are **invertebrates**.

They have a soft body, no spine and are covered by a cone shaped shell.

They are usually found clamped to rocks on a rocky shore.

They are **herbivores**.

They are **primary consumers**.

Diet: **Seaweed**.

Orca

Orcinus orca

© Walter Baxter, Geograph.org.uk

Oystercatcher

Haematopus ostralegus

© Andreas Trepte, www.avi-fauna.info

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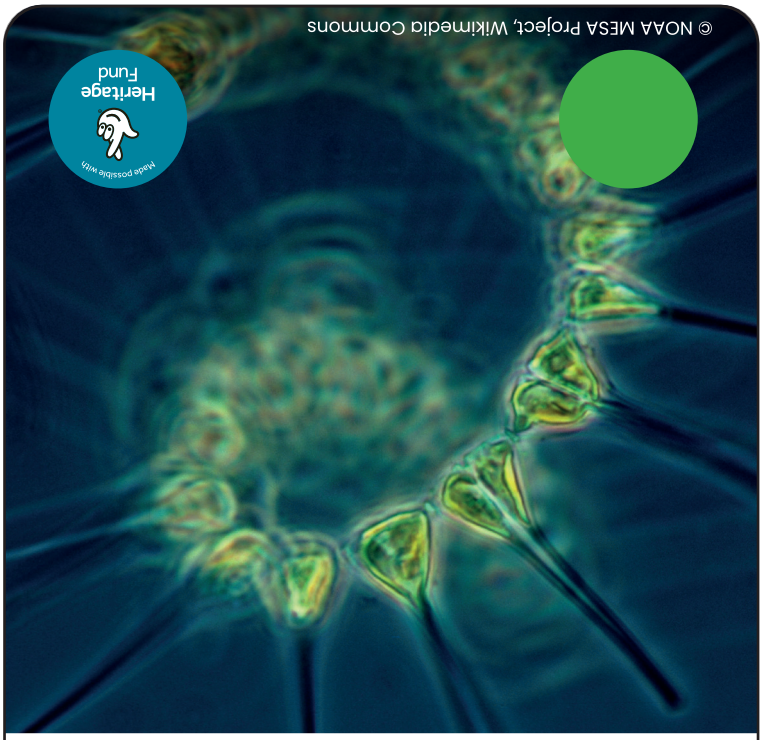
Prawns

Palaemon serratus



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Phytoplankton

Prawns are **crustaceans**.

This means they are **invertebrates** – which have a hard exoskeleton (shell).

They have a partly see-through body with tiger stripes, large eyes and brown antennae. They have five pairs of swimming legs and five pairs of walking legs, three of which have nippers to pick up food.

They are **omnivores**.

They are **secondary consumers**.

Diet: **Decaying seaweed, Dead animal matter**.

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Phytoplankton are **microscopic** plant or plant like organisms that drift around in the ocean currents.

They are found floating near the surface of seas all over the world.

They are **producers**.

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Oystercatchers are **wading** seabirds. They are **vertebrates**.

They have a large orange beak and black and white plumage.

They use their large beak to probe for worms in the sand and for opening molluscs.

They are **carnivores**.

They are **tertiary consumers**.

Diet: **Worms, Molluscs**.

Orca are **mammals**.

They are **vertebrates**.

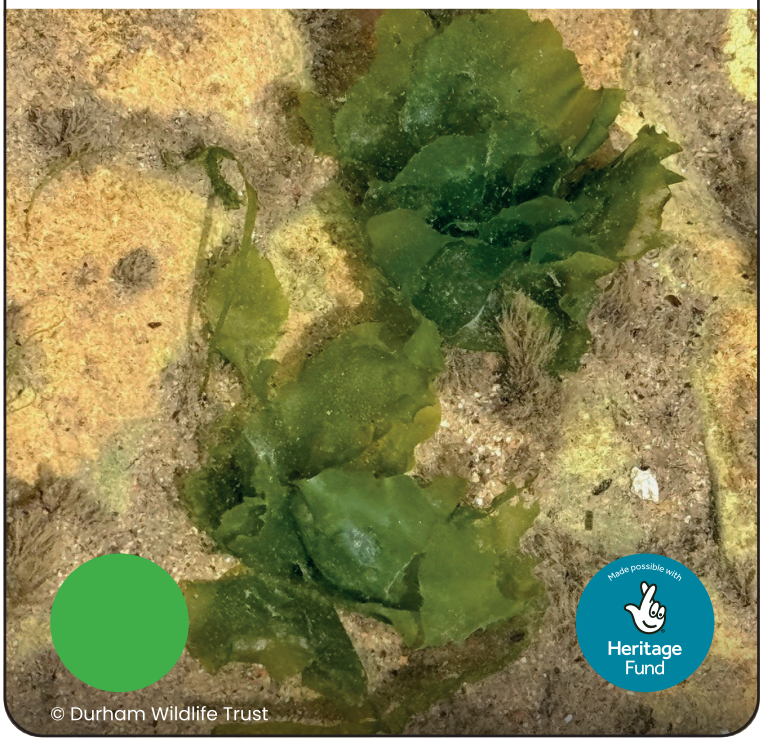
They have distinctive black and white colouring and an enormous dorsal fin.

They are apex **carnivores** and powerful hunters. They are **tertiary consumers**.

Diet: **Seals, Dolphins, Whales, Sharks, Fish**.

Sea lettuce

Ulva lactuca



Sea star

Asterias rubens

Sea anemone

Actinia equina

Sand eel

Sea stars are **echinoderms**. They are **invertebrates**.

Their mouth is at the centre of their arms, underneath their body. They can grow up to around 30cm.

Their mouth and stomach can come out of their body so they can eat things bigger than their mouth.

They are **secondary consumers**.

Diet: **Mussels, Oysters, Crabs**.

Sea lettuce is a **green seaweed**.

It is found in rockpools along the shore, attached by a small **holdfast**.

It is bright green and **transluscent**.

It is a **producer**.

Beadlet sea anemones are **cnidarians**. They have stinging cells and are related to corals and jellyfish. They are **invertebrates**.

They have a soft, stalk like body, topped by an oral disk surrounded by short, thick stinging tentacles. The base of their body acts as a sucker to keep them stuck to rocks.

They are **carnivores** and **secondary consumers**.

Diet: **Crab, Small Fish, Shrimp.**

Sand eels are thin eel-like fish. This means they are **vertebrates**.

They move around in large groups called shoals. In winter, they burrow themselves in the sand.

They grow to a maximum length of 20 cm.

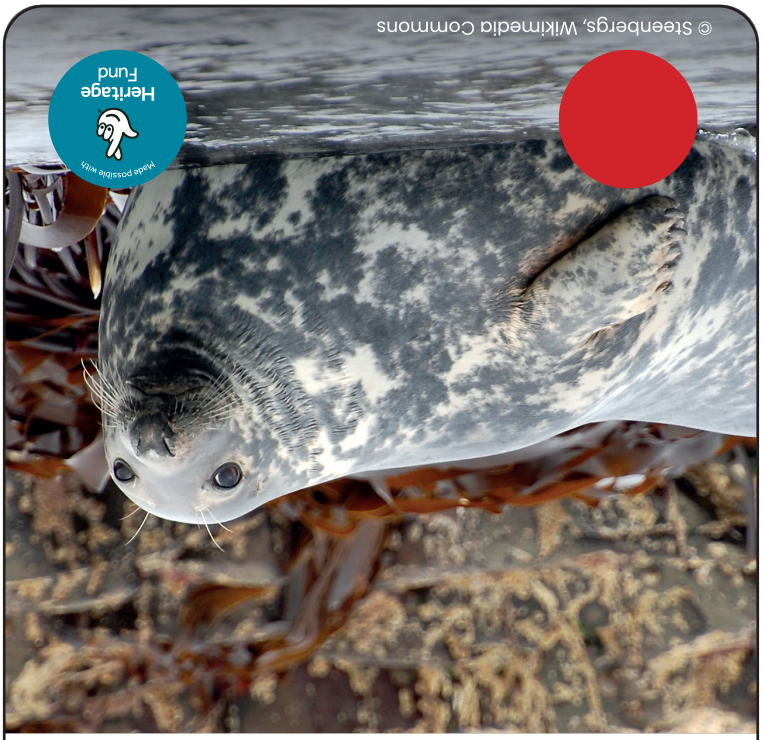
They are **carnivores**.

They are **secondary consumers**.

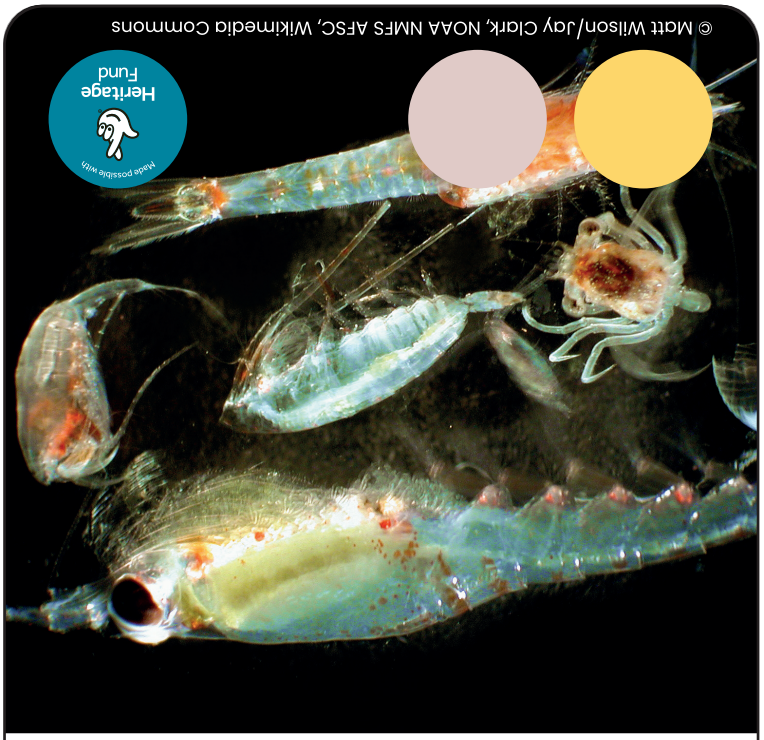
Diet: **Zooplankton, Fish eggs**.

Serrated wrack
Fucus serratus

Shore crab
Carcinus maenas



Grey seal
Halichoerus grypus



zooplankton

Grey seals are **mammals**. They are **vertebrates**. They have grey blotchy skin and a hooked nose. They can grow up to 3m long and weigh 300kg.

They are **carnivores**. They are **tertiary consumers**.

Diet: **Sandeels, Flat fish, Herring, Crab, Octopus**.

Zooplankton are **microscopic** animals or animal like **organisms** that float and drift along near the surface of the world's oceans and other bodies of water.

Zooplankton are **primary** and **secondary consumers**.

They are **omnivores**.

Diet: **Phytoplankton, Zooplankton**.

Crabs are **crustaceans**. They have a hard exoskeleton (shell) which can be up to 8cm wide, with 5 'teeth' on either side.

They are **invertebrates**.

They are **carnivores** and have 8 legs and 2 claws which they use to catch their prey.

They are **secondary consumers**.

Diet: **Barnacles, Mussels, Prawns.**

Serrated wrack is a brown **seaweed.**

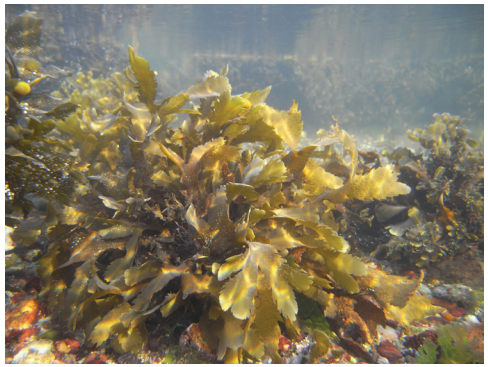
It grows just above the low water mark on rocky shores.

It gets its name from the jagged, serrated edges to its **fronds** and is sometimes called toothed wrack.

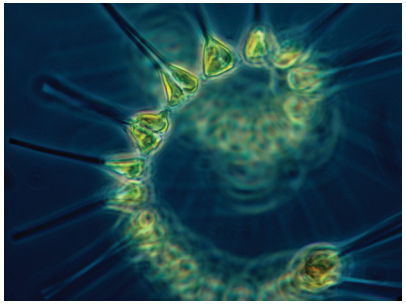
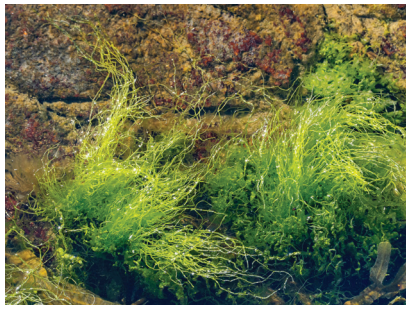
It is a **producer**.

Appendix A – Teacher species information resource

Food chain place	Species	Image	Information
Producer 	**Sea lettuce** Ulva lactuca		Sea lettuce is a common seaweed, found attached to rocks and other surfaces in rock pools. As a producer it gets its energy from the sun, so tends to be found in shallow pools along the coast.. Sometime the leaves (fronds) become detached from the plants' roots but can continue to grow and create floating colonies. The ruffled fronds are bright green and translucent. Sea lettuce is food for a variety of creatures including sea slugs such as sea hares and sea snails.

Food chain place	Species	Image	Information
Producer	**Bladder wrack** Fucus vesiculosus		Bladder wrack is a common seaweed, which grows between the high and low water marks on rocky shores. It forms dense beds on the mid shore and provides a shelter for many creatures. As a producer it gets its energy from the sun. Bladder wrack has round air bladders, often appearing in pairs either side of the pronounced mid-rib which allow the seaweed to float upright underwater, helping with gaseous exchange and nutrient absorption. Bladder wrack is a food source for periwinkles.
Producer	**Serrated wrack** Fucus serratus		Serrated wrack or Toothed wrack is a common olive brown seaweed that grows just above the low water mark on rocky shores. Its name comes from the serrated edges on its fronds. It does not have air bladders and the fronds are flat not spiraled. Serrated wrack provides shelter for many creatures in the lower shores, including Flat periwinkles and many small crustaceans. Other seaweeds grow on its fronds, including Dulse. The dense bunches provide shade and shelter in rock pools too.

Food chain place	Species	Image	Information
Producer	**Purple laver** Porphyra umbilicalis		Purple laver is a common seaweed found on rocky shores and can tolerate long periods of air exposure between tides. It attaches to the rock with a disc-like holdfast and occurs both singularly and in colonies. The purple fronds are tough, thin, with membrane-like fronds that vary in shape. Purple laver is a favourite food in parts of Wales, where it is used to make laver bread and jelly or rolled in oatmeal and fried in bacon fat. It is often served cold in Cornwall, doused with vinegar.
Producer	**Oarweed** Laminara digitata		Oarweed is a common kelp seaweed found in shallow seas around our coasts. It grows in dense kelp beds, attached to the rocky seabed using tough, root-like holdfasts. It grows at depths of up to 20m and its floating fronds may be exposed at low tide. Its holdfast creates a microhabitat for many small species - including worms, brittle stars and even sea spiders! If you spot kelp washed up on the shore, look closely at the holdfast (looks like roots) and see if anything is inside! Oarweed's fronds are flat and split into finger-like sections, often resembling a hand. The stipe is very flexible, allowing it to bend right over on very low tides and stop the fronds from drying out. This feature also allows it to survive rough and stormy conditions. Used by humans for centuries for fertiliser, food and as a source of chemicals. Food for sea snails.

Food chain place	Species	Image	Information
Producer	**Phytoplankton**		Plankton are organisms drifting in the oceans and seas. Phytoplankton float near the surface of the water. Like other plants they use sunlight to produce energy releasing oxygen in the process.
Producer	**Gutweed** Ulva intestinalis		Gutweed is a common seaweed found on all UK shores and in many different habitats, including rock pools, sand, mud and even on shells and other seaweeds. It is a mass of bright grass-green, long fronds with bubbles of air trapped inside, which have the look of intestines, hence its name. If detached, Gutweed can create large floating masses, buoyed by the gas in its inflated tubular fronds. Dense growths of Gutweed provide shelter for many other creatures. Food for sea snails.
Decomposer	**Detritus**		Detritus is made up of organic matter- dead seaweed and animal matter. Food for scavenging animals such as prawns, lugworms, sea stars and crabs.

Food chain place	Species	Image	Information
Primary consumer	**Flat periwinkle** Littorina obtusata		Flat periwinkles are molluscs. Found amongst the seaweeds (usually bladder wrack and serrated wrack) on which they feed, flat periwinkles live on the lower parts of the shore. They come in lots of different colours including orange, bright yellow, olive green and brown. Periwinkles are able seal themselves into their shell by closing the 'door' - a round operculum. Flat periwinkles can breed throughout the year and have both male and female forms. Eggs are internally fertilised and laid on seaweed in masses of up to 280 eggs. Food for: dog whelks, crabs, sea stars, oyster catchers, humans, fish.
Primary consumer	**Limpet** Patella vulgata		Common limpets are molluscs. They have cone-like shells and are usually seen firmly clamped to the side of rocks. Limpets move around over the rocks when the tide is in to graze on seaweed, using their tough tongue - their tongue is the world's strongest known biological structure. Limpets always return to their own favourite spot when the tide goes out, following the mucus trail that they have deposited. This spot becomes worn by the edges of the shell, and eventually an obvious 'scar' in the rock is created. This 'home scar' helps the limpet to better attach to the rock, stopping it drying out until the next tide comes in. Food for starfish, dog whelks, oyster catchers, crabs and lobsters.

Food chain place	Species	Image	Information
Primary consumer **Secondary consumer**	**Zooplankton**		Plankton are small floating or weakly swimming organisms that drift with water currents. Zooplankton refers to all the animal plankton, which encompasses a huge number of different species. The larvae of jellyfish, crabs, fish, copepods and amphipods are all types of zooplankton. They vary in size from a fraction of a mm. They are omnivores feeding on phytoplankton and other zooplankton. Food for fish, jellyfish, sand eels, sea anemones, molluscs.
Primary consumer **Secondary consumer**	**Chiton** Lepidochitonia cinerea		Chitons are molluscs, identifiable by their mottled grey shell, which offers them good camouflage on a rocky shore. They are omnivores, feeding on seaweed and barnacles using their tough rasping tongue, or radula. Chitons are sometimes called 'coat of mail' shells as they have 8 interlocking shell plates across their backs, which helps them to cling tightly to rocks. Chitons are eaten by humans, sea gulls, sea stars, crabs, lobsters and fish.

Food chain place	Species	Image	Information
Primary consumer **Secondary consumer**	**Barnacle** Semibalanus balanoides		The most common barnacle found on our shores, the acorn barnacle, lives attached to any hard substrate, including rocks, pier legs, old boats and even other animals! Its body is contained within the shell you see on the rocks, positioned upside down with its legs at the top. When the tide comes in, it opens the plates of its shell and sticks its legs out, using them to catch zooplankton, phytoplankton and other detritus out of the water. Food for chitons, starfish, dog whelks, fish and crabs.
Secondary consumer	**Beadlet anemone** Actinia equina		Beadlet anemones are cnidarians and have stinging cells. They are most commonly spotted as dark red, orange or green blobs of jelly in rock pools, the base of their body acts as a sucker, helping keep them securely fastened to rocks. When the tide comes in the thick short tentacles become visible. They are carnivores. They use these tentacles to sting and catch passing prey like crabs, shrimp and small fish. These are then retracted at low tide or when disturbed. Beadlet anemones are territorial. They have a ring of beautiful bright blue beads beneath their tentacles called acrorhagithat, packed full of stinging cells. They use these beads to fight off other anemones and defend their preferred patch. Food for fish, sea stars.

Food chain place	Species	Image	Information
Primary consumer **Secondary consumer**	**Prawn** Palaemon serratus		Common prawns are found in rock pools and shallow waters down to around 40m deep, normally hiding in crevices or under stones. They have translucent bodies with brownish-red tiger stripes along the length. They have large eyes separated by a serrated rostrum. Their walking legs are banded with reddish-brown and bright yellow and they have very long brown antennae. Common prawns are scavengers. They will eat anything they find, from decaying seaweed to dead mussels. They are primary and secondary consumers. Food for: sea anemones, fish, lobster, crabs and humans.
Primary consumer **Secondary consumer**	**Lugworm** Arenicola marina		Lugworms are invertebrates. They live in burrows in the sand both on the beach and in the sandy seabed. Their burrows are u-shaped and are formed by the lugworm swallowing sand and then pooing it out, creating wiggly piles of sand along the shoreline. These are known as casts. Lugworms feed on tiny animals and dead matter that are filtered through the sand they eat. Food for: oyster catchers, crabs, fish. Fishermen use them for bait.

Food chain place	Species	Image	Information
Secondary consumer	**Shore crab** *Carcinus maenas*		Crabs are crustaceans. This means they are invertebrates – which have a hard exoskeleton (shell) with 5 teeth on either side. Their shell grows to a maximum of 8cm wide. They are found at varying heights on the shore and down to depth of about 60m below sea level. They are carnivores and have 8 legs and 2 claws which they use to catch their prey of barnacles, mussels and prawns.They are secondary consumers and can be prey to tertiary consumers such as birds, octopus, lobsters and humans.
Secondary consumer	**Sea star** *Asterias rubens*		Sea stars are echinoderms. They are invertebrates. They have tube feet (called a water vascular system) which they use for moving and feeding. They have tiles of hard covering over their upper surface which are composed of calcium carbonate. They can grow up to around 30cm in diameter. Their mouth is underneath, central to their arms. Sea stars can regrow their arms. They are secondary consumers with a diet composed of mussels, oysters and clams, and because their mouth can expand from inside their bodies, they are able to eat things bigger than their mouth. Sea stars are prey to tertiary consumers including crabs, gulls and, when small, sea anemones.

Food chain place	Species	Image	Information
Secondary consumer	**Hermit crab** Pagurus bernhardus		Hermit crabs are crustaceans. They have a soft exoskeleton which they protect by living inside the empty shells of other dead animals. They are not true crabs as their body is reduced. As they grow, they need to find new, bigger shells to cover their bodies. They can grow to 35mm. They are found at varying depths down to about 140m. They are secondary consumers and omnivores and will feed on a variety of small animals including prawns, small fish and seaweeds. They are prey to tertiary consumers including gulls and sea stars and crows.
Secondary consumer	**Blenny** Chirolophis ascanii		Blennies are fish which are vertebrates of the Chordata phylum. They may grow to 25cm in length. They have bodies free of scales and a large head with downturned mouth. Their lower fins are close to the head. They have two pairs of fins – the pectoral fins which are broad and the pelvic fins which are thinner and used to grip rocks in the rock pools. They also have a long dorsal fin down their back. They are secondary consumers and omnivores. They feel on barnacles and algae in the rock pools where they live. They are prey to tertiary consumers including crabs and sea birds.

Food chain place	Species	Image	Information
Secondary consumer	**Butterfish or Rock gunnel** *Pholis gunnelus*		Butterfish are fish, which are vertebrates. They have flattened bodies like eels. They have thick fleshy lips and a black stripe through their eyes. They have very slimy skin, hence their name. They are found on the lower parts of the beach, often under seaweed or in crevices and may be found underwater to a depth of about 40m. They are secondary consumers and carnivores and they eat crustaceans, bristle worms, mussels and fish eggs. They are prey to tertiary consumers including larger fish, sharks and squid.
Secondary consumer	**Dog whelk** Nucella lapillus		Dog whelks are gastropod molluscs. They are invertebrates. There are 6 bands down its spiral shell. Each of the bands has ridges. They can be found in multiple different colours. They have a short, straight siphonal canal at the opening. Dog whelks are secondary consumers and carnivores and eat mussels and barnacles. Other whelk species can grow to 10cm. They are prey to tertiary consumers including humans, crabs and sea birds.

Food chain place	Species	Image	Information
Secondary consumer	**Herring** *Clupea harengus*		Herrings are fish, which are vertebrates. There are 4 different populations of herring around the UK and Baltic which move around interchangeably until spawning season when they return to a specific site to breed. They may grow to 45cm and weigh up to 1.1kg. They travel in schools of thousands of individuals, maintaining a spatial pattern when swimming which allows the school to maintain a constant speed. The schools travel between spawning grounds to feeding grounds and then to nursery grounds. This is thought to enable them to avoid eating their own young. They are secondary consumers, feeding on zooplankton of various types including mollusc free living larvae, fish eggs and krill. They are prey to tertiary consumers including humans, sea birds, sea mammals and larger fish such as tuna and salmon.
Secondary consumer	**Sand Eel**		Sand eels are thin, eel-like fish which are vertebrates. There are many different species of sand eel. They are found in large shoals. In the winter, sand eels bury themselves 20 - 50cm deep in sand, hence their name. They grow to a maximum length of 20 cm. They are darker on the top and silvery below. They have a single dorsal fin along the back and a small tail. Sand eels are secondary consumers, eating zooplankton and feeding on the eggs and larvae of crustaceans and other creatures. They are prey to tertiary consumers including Kittiwakes and Puffins and used to be an ingredient of fishmeal.

Food chain place	Species	Image	Information
Secondary consumer	**Edible crab** Cancer pagurus		Edible crabs are invertebrates. Their hard shell (also called an exoskeleton or carapace), with its characteristic 'pie crust' edging, can reach up to about 25cm in width, but is generally around 15cm. The tips of their powerful claws are black. They are nocturnal. They are secondary consumers and carnivores eating crustaceans and bivalves such as mussels and other molluscs. As suggested by their name, they are prey to tertiary consumers, including humans, and are a favourite food for octopus.
Tertiary consumer	**Catshark** Scyliorhinus canicular		While previously called dogfish these are now separate species as dogfish typically produce live young. Like all sharks catsharks have a cartilage skeleton and are vertebrates. They have rough leathery skin and 5 gill slits. They have a blunt head with a rounded snout. They grow to 75cm long. Catsharks lay eggs in egg cases known as mermaid's purses. The egg cases are attached to large seaweeds such as kelp by tendrils. They are bottom feeding carnivores and tertiary consumers feeding on gastropod molluscs which have a coiled shell, cephalopods like octopus and squid, crustaceans such as prawns, as well as worms and small fish. They are prey for humans, seals and larger fish such as cod and hake.

Food chain place	Species	Image	Information
Tertiary consumer 	**Grey seal** *Halichoerus grypus*		Grey seals are fin-footed pinniped mammals. They are carnivores, eating a wide variety of fish, including sand eels, flatfish, cod, skates and herring and other species such as octopus, lobster and even marine mammals such as harbour porpoises. As adults, they are at the top of the food chain as tertiary consumers. Their young can be taken by golden eagles. Where they occur together, grey seals may be predated on by another tertiary consumer – the killer whale or orca.
Tertiary consumer 	**Octopus** *Eledone cirrhosa*		The octopus is an invertebrate of the Cephalopod family. The UK's most widespread octopus (the curled octopus) has a single line of suckers on its tentacles. The common octopus has two rows. In some locations, such as the rocky shore where big predators cannot reach it, it is a tertiary consumer. In the open ocean, it may be eaten by conger eels, sharks and dolphins. It is a carnivore and eats cockles, mussels and crabs – anything it can catch.

Food chain place	Species	Image	Information
Tertiary consumer 	**Bottlenose dolphin** Tursiops truncates		The bottlenose dolphin is a cetaceous mammal. It is a vertebrate. Dolphins can be found all around the UK. There are semi-resident populations of dolphins in Cardigan Bay, Wales and the Moray Firth in Scotland. Smaller groups or individuals may be seen almost anywhere. The dolphins use echolocation to find their food. Young dolphins are prey for the bigger shark species such as tiger and great white sharks. They are tertiary consumers and carnivores, feeding on fish, squid and shrimps. Humans are a main killer especially due to heavy metal pollution and dolphins accidently being caught in fishing nets.
Tertiary consumer 	**Fin whale** Balaenoptera physalus		The fin whale (known also as the rorqual whale) is a marine mammal and a vertebrate. It is a close relative of and second only in length to the blue whale. The fin whale is a cosmopolitan species – meaning that it occurs in all the oceans. It can grow up to 24m in length. Its dives can last up to 10 minutes. The fin whale is a tertiary consumer and carnivore, being a baleen or filter feeding whale feeding on fish including herring, krill and squid. Fin whales are occasionally attacked by killer whales but there is little evidence of them being predated upon.

Food chain place	Species	Image	Information
Tertiary consumer	**Orca** Orcinus orca		Orca or killer whale is a mammal and a vertebrate. It is a toothed whale and the largest member of the oceanic dolphin family. Its black and white patterning and enormous dorsal fin makes it instantly recognisable. Males are larger than females and have much taller dorsal fins, up to 1.8 m tall. Orcas roam huge distances in search of food, often in family groups called pods. Unfortunately, the UK's resident orca community consists of just eight individuals, making sightings rare. Known as the 'west coast community', this group arrives in Northern Scotland in early summer to feast on fish. The pod travels to the Farne Islands, in the Spring to hunt for seals. Orca is one of the apex predators in the world's oceans. These powerful hunters are tertiary consumers and carnivores, and they eat a wide variety of prey including fish, seals, porpoise, whales, dolphins, seabirds, sharks, rays, octopus and squid.
Tertiary consumer	**Oystercatcher** *Haematopus ostralegus*		The oystercatcher is a wading seabird with a large orange beak and black and white plumage. The male and female are similar with the female having a slightly longer bill. It is resident on our coasts all year round. It is a carnivore. It is a tertiary consumer. Its long bill is used for opening molluscs such as cockles, oysters and mussels or for finding worms in the sand or in-land in fields. Although occasionally they may be eaten by birds of prey, they are generally seen as being at the top of the food chain.