# Sea Lettuce

*Ulva fenestrata*

*Very variable in size and shape (often with holes in). Bright green and (guess what?) the flat fronds look like lettuce!*

**Size:** Up to 100cm long.

**Lives**: All over the shore in pools, crevices and amongst other seaweeds.

**Eats**: Gets energy from the sun (photosynthesis).

**Eaten by**: Limpets and winkles…..and humans.

**Special powers**: **49** Can grow even when it is not attached to a rock.

# Gut Weed (Intestine Weed)

*Ulva intestinalis*

*Very thin and tubular. Bright or dark green.*

**Size:** Up to 30cm long.

**Lives**: All over the shore, often common where there is a freshwater source. As well as being attached to rock it can be found on seashells (funky limpet 'hair'!).

**Eats**: Gets energy from the sun.

**Eaten by**: Sea snails.

**Special powers**: **45** Very slippery to human feet so be careful.

# Channel (Channelled) Wrack

*Pelvetia canaliculata*

*The sides of the frond roll inwards forming 'channels'. Green/brown but turns black & crispy when dry. No air bladders.*

**Size:** 5 to 15cm.

**Lives**: Upper shore in "tufts". Near/just above Spiral Wrack.

**Eats**: Gets energy from the sun.

**Eaten by**: Sea snails when young.

**Special powers**: **81** It can survive up to eight days without submersion. Can survive even when it loses a massive 95% of its water content. Each seaweed is male and female at the same time!

## Spiral wrack (Spiralled or Twisted wrack)
*Fucus spiralis*

*Spirals or twists near the tips to save water. No air bladders. Reproductive spotty 'buds' found at the tips of the olive green/brown fronds.*

**Size:** Up to 20cm.

**Lives**: Upper shore in dense "tufts". Near/just below Channel Wrack.

**Eats**: Gets energy from the sun.

**Eaten by**: Sea snails when young.

**Special powers**: **78** Each seaweed is male and female at the same time! Like many brown seaweeds, it can forecast the weather. Hang it up outside your house. When it goes dry it will be sunny, when it swells up and goes limp rain is on its way!

# Bladder Wrack

*Fucus vesiculosus*

*Obvious round air "bladders" (usually in pairs each side of the mid-rib). Olive green/brown.*

**Size:** 15 to 90cm.

**Lives**: Common on the middle shore on rocks and stones (below Spiral wrack and near/above Serrated wrack).

**Eats**: Gets energy from the sun.

**Eaten by**: Flat periwinkles.

**Special powers**: **74** It uses air "bladders" to help it float when the tide is in so that it can reach the sunlight. Lives for around 2-5 years.

# Serrated (Saw or Toothed) wrack

*Fucus serratus*

*Its fronds are flat, have serrated 'saw-like' edges, and do not have air bladders. Other seaweeds grow on it.*

**Size:** Commonly up to 60cm.

**Lives**: Lower shore rocks and in pools.

**Eats**: Gets energy from the sun.

**Eaten by**: Flat periwinkles.

**Special powers**: **72** Extracts from this seaweed (called 'alginates') can be used in the making of toothpaste, beer and ice-cream!

# Kelp (Oarweed, Tangle)

*Laminaria digitata*

*A large glossy brown seaweed. The frond is split into many "digits". The holdfast (attachment) is very branched and broad giving it a strong grip to the rock. The smooth stipe is flexible so at low tide the plant goes limp and lies flat in the water.*

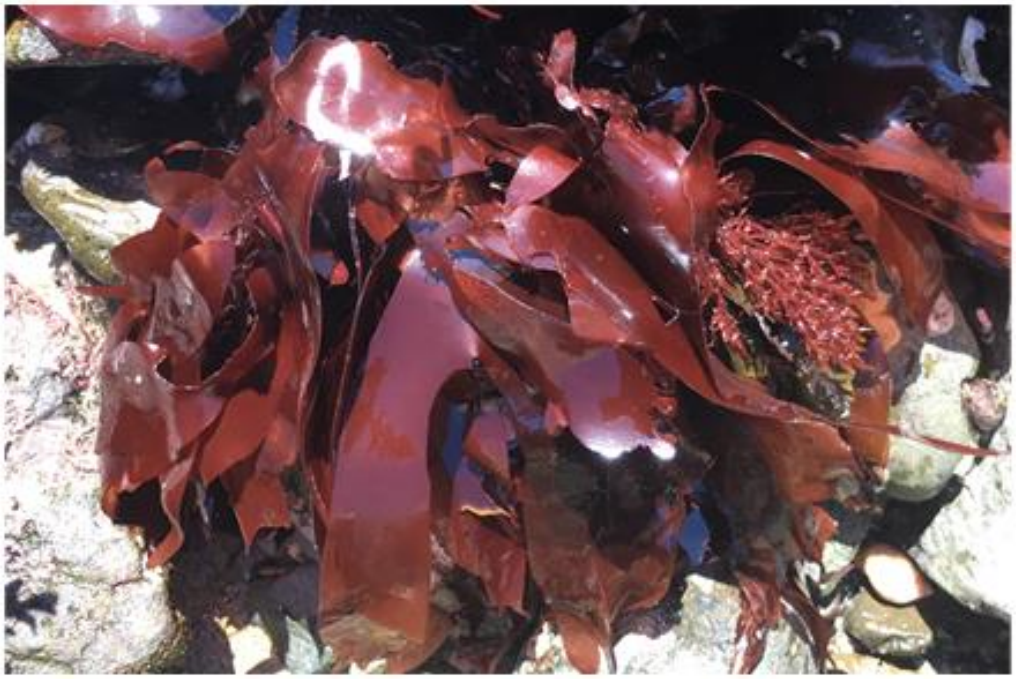
**Size:** Up to 200cm.

**Lives**: Extreme low shore.

**Eats**: Gets energy from the sun.

**Eaten by**: Look out for the beautiful, Blue-rayed Limpet on the fronds which feeds on the kelp.

**Special powers**: **80** Its fingered (digitated) form helps it survive wave action. Kelp stipes (stems) are the main source of alginates, a natural product that is used widely in the pharmaceutical and cosmetic industries (gels, hair styling foam…). Kelps play a role in the recycling of coastal nutrients and supporting food chains by providing food and shelter for multiple marine creatures.



# Dulse

*Palmaria palmata*

*Flat leathery dark red-purple frond. The fronds gradually widen and subdivide from the base.*

**Size:** Usually between 20 - 50cm in length, but sometimes up to 100cm.

**Lives**: Lower shore rocks and in pools.

**Eats**: Gets energy from the sun.

**Eaten by**: Humans like to eat it!

**Special powers**: **44** Requires a fraction of the light used by land plants. Red seaweeds are the oldest seaweed group (preserved in fossil record 1.2 billion years ago).

# Pepper Dulse

*Osmundea pinnatifida*

*A small tough red seaweed with flattened fronds that branch alternately becoming shorter towards the top and broadly rounded. Plants found higher up the shore are usually small and yellow green in colour due to greater exposure to sunlight. In contrast, plants living on lower parts of the shore tend to be reddish-brown.*

**Size:** Up to 8cm.

**Lives**: Middle shore and lower shore. Pepper Dulse is very tolerant of shade.

**Eats**: Gets energy from the sun.

**Eaten by**: Not a lot! Humans!

**Special powers**: **60** Full of anti-grazing chemicals to stop it being eaten, that's why it smells of TCP! Despite this it is a popular seaweed to dry and use as a spice.

# Laver

*Porphyra* spp.

*A flat sheet - brown or purplish red plastered on tops of rocks, usually a lot of it in one place. Has a slippery polythene-like texture.*

**Size:** Up to 20cm across.

**Lives**: All over the shore on rocks.

**Eats**: Gets energy from the sun.

**Eaten by**: Humans like to eat it!

**Special powers**: **42** Used to make laver bread, high in protein and rich in vitamins. Edible when cooked – not advisable to eat this seaweed on the shore! Related to the species commonly called 'nori' from Japan.

# Coral Weed

*Corallina* spp.

*A calcareous (chalky) red seaweed, it forms pink bush like growths that look like miniature coral. The little feather-like branches are so heavily impregnated with hard lime that they snap off when handled.*

**Size:** Up to 12cm high.

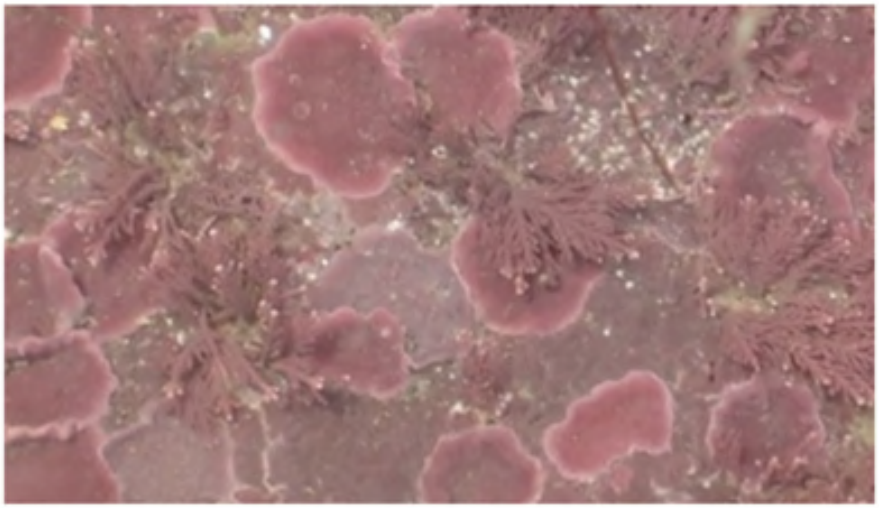
**Lives**: Usually fringing rockpools.

**Eats**: Gets energy from the sun.

**Eaten by**: Not much can munch it apart from China Limpets and chitons.

**Special powers**: **57** The lime rich tissues are pretty disgusting to eat which is handy considering that many shore species are vegetarian. When exposed out of the water it goes white ('bleaches'). The more brightly lit the pool, the paler it is.

## Pink Paint (encrusting pink algae)
Corallinaceae (multiple species)



*They are hard to touch and look more like paint or rock than seaweed. Colour varies from dark pink/purple to white and the crust can be smooth or ridged.*

**Size:** Hard to tell where they start and finish!

**Lives**: These coat the sides and base of rock pools and can be found underneath seaweeds on the lower shore.

**Eats**: Gets energy from the sun.

**Eaten by**: Not much can munch it apart from China Limpets and chitons.

**Special powers**: **48** These are the calcareous 'lime' algae. The lime rich tissues are pretty disgusting to eat which is handy considering that many shore species are vegetarian. In well-lit locations the paint weed can bleach to white. A white rim of these can often be seen around rockpools where the water has evaporated.

# Dog whelk

*Nucella lapillus*


*A rounded shell with a pointed spire. Shape, thickness and colour vary - often white, sometimes with dark stripes. Separated from other seashore snails by the distinct groove in the shell lip next to the opening.*

**Size:** Commonly 3-4cm.

**Lives**: Middle to lower shore rocks, often near barnacles and mussels.

**Eats**: True carnivores; they eat barnacles, mussels, winkles and limpets.

**Eaten by**: Crabs and seabirds.

**Special powers**: **88** Drills through the shell of its prey then injects enzymes to digest the insides before sucking the 'soup' back out. It can take 2-3 days to eat a barnacle and up to 5 for a mussel. In times past, purple dyes were extracted from whelks.

# Flat Periwinkle

*Littorina littoralis* agg.

*Flattened top to the smooth shell. Colour varies from bright yellow to orange, olive-green and brown. Hard 'door' to tear-drop opening that can be used to seal snail in.*

**Size:** Up to 1.5cm high.

**Lives**: On brown seaweed (Bladder, Egg and Serrated Wrack).

**Eats**: Brown seaweed.

**Eaten by**: Crabs, fish and seabirds.

**Special powers: 67** These sea snails can seal themselves into their shell by closing an oval 'door'. Their variable colouration is good camouflage against the brown seaweeds that they live on (brown seaweeds like Serrated Wrack look yellow when viewed from underneath, so flat periwinkles do blend in really!). Their round shape also mimics the air bladders found on some brown seaweeds.

# Edible Winkle

*Littorina littorea*

*Large rounded dark brown or grey banded shell with a pointed tip. Hard 'door' to tear-drop opening that can be used to seal snail in.*

**Size:** 3-6cm.

**Lives**: On rocks and amongst seaweeds on the middle and lower parts of the shore.

**Eats**: Biofilm and young green seaweeds in particular.

**Eaten by**: Crabs, fish, seabirds and humans.

**Special powers**: **56** Eat their own pooh to recycle nutrients (yuk!). The largest periwinkle found on our coast. Has a heavy shell for protection but can't handle very exposed shores with big waves.

# Rough periwinkle

*Littorina saxalitis* agg.

*Has obvious ridges / grooves along the shell which make it feel rough. Many colours but usually grey or brown.*

**Size:** Up to 2cm.

**Lives**: In damp cracks and crevices all over the shore, but especially higher up in the upper shore and splash zone. Can hide inside old barnacle shells.

**Eats**: Microscopic seaweed (biofilm) and lichen.

**Eaten by**: Not eaten by much!

**Special powers**: **84** They breathe air using their mantle cavity as a lung, they can 'poo' uric acid and are masters of saving water being able to survive more than 90% of their life out of water (very handy if you live high up on a seashore). In very dry conditions they glue themselves on to the rocks and withdraw into their shell, closing the door (operculum) behind them. They can also keep their eggs inside their shell until they hatch so the babies are protected.

# Purple Top Shell

*Steromphala umbilicalis*

*Attractive shell - greyish-green in colour with well-spaced diagonal purple stripes (brighter when younger). Distinctive hole next to the opening. If you look at the opening, you can also see the mother-of pearl shimmer – a feature of all top shells.*

**Size:** Up to 1.5cm.

**Lives**: All over rocky shores in crevices and rockpools.

**Eats**: Seaweed and small dead plants.

**Eaten by**: Crabs and seabirds.

**Special powers**: **66** Can make its own shell - and what a shell! See that mother-of-pearl on the underside? These sea snails can seal themselves into their shell by closing a round 'door'.

# Limpet

*Patella spp.*

*Pyramid shaped shells. They graze when the tide is in and always come back to the same spot on the rock. This spot is called the 'home scar' and the limpet's shell fits perfectly to the rock. Its strong sucker foot keeps it held to the rock. Never forcibly remove!*

**Size:** Up to 7cm diameter.

**Lives**: All over the shore. Most numerous on the middle shore alongside barnacles.

**Eats**: Microscopic seaweed (biofilm) and young seaweeds (pink encrusting weeds too).

**Eaten by**: Seabirds and sometimes, starfish.

**Special powers: 100** Has an amazing homing instinct that still baffles scientists, returning to its home scar base after feeding. Long lived (about 16 years old). Its rasping tongue is the world's strongest biological structure - makes wonderful scrape patterns on the rocks. All limpets are male first, then some turn into females! They can hold on to rock with a force of 52,730kg/$m^2$.

# (Acorn) Barnacle

e.g. *Semibalanus balanoides*

*Various species. These little grey bumps covering the rocks can be sharp so watch out when rockpooling! The most common shore barnacle, Semibalanus balanoides, is generally grey, white in colour, with a diamond-shaped opening and 6 shell plates.*

**Size:** Up to 1.5cm.

**Lives**: On rocks and other hard surfaces mainly on the lower and middle shore.

**Eats**: Plankton (tiny plants and animals in the sea).

**Eaten by**: Fish, dog whelks, green leaf worms.

**Special powers**: **95** Live with their heads stuck to the rock using some of the strongest 'glue' known. Catch food by waving their feathery legs as a 'net' out of their self-made trap doors. Can live stuck to whales, crabs and even plastic bottles. And they have the longest penis of the animal world relative to body size!

# (Blue or Edible) Mussel

*Mytilus edulis*

*A bivalve (has two shells joined together). Roughly triangular blue-black (sometimes brown) smooth shell; older individuals may have barnacles and seaweed growing on them.*

**Size:** Usually 3-10cm.

**Lives**: Often in large numbers on rocks and other hard surfaces mainly on the lower and middle shore.

**Eats**: Plankton (tiny plants and animals in the sea).

**Eaten by**: Eaten by dogwhelks, starfish and seabirds and also enjoyed by humans!

**Special powers**: **69** Attaches itself to the rocks with self-made byssus threads so that it can't be washed away, but also uses these for more gruesome purposes by making prisoners of their dog whelk predators so that they can't move and so starve to death! Revenge!

# Orange sponge

Various species

*Variable - may be thin, rough sheets, or rubbery blobs. Can have knobbles. The surface will have many holes.*

**Size:** Patches about 10cm wide.

**Lives**: Sponges are very sensitive to drying out so are usually found under boulders, under seaweed and in damp places like overhangs and crevices. Lower shore.

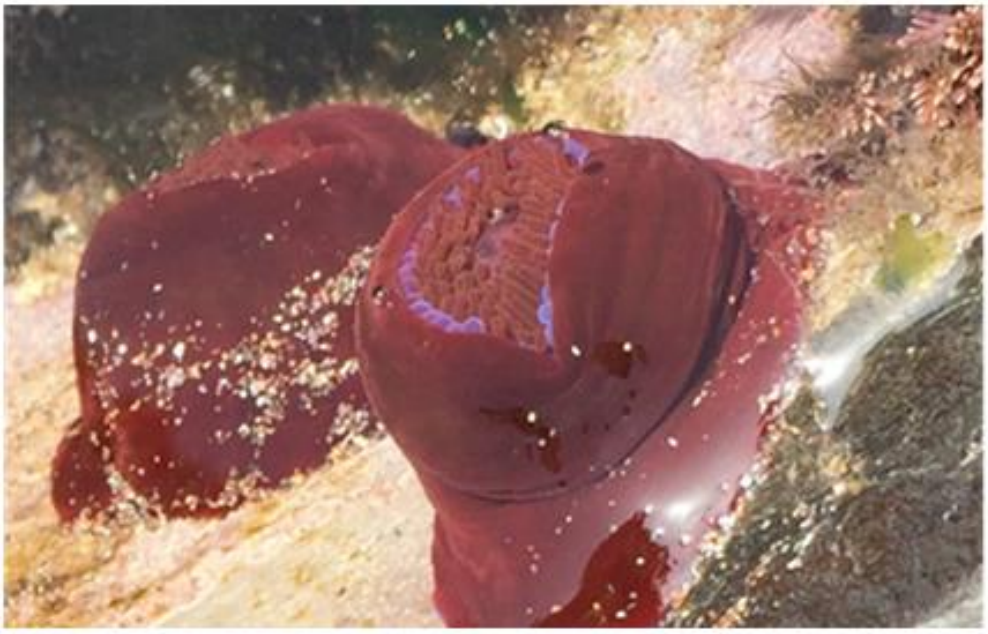
**Eats**: When the tide is in, they filter water for plankton and detritus (dead organic matter).

**Eaten by**: They have chemicals to deter predators but may be eaten by seaslugs.

**Special powers**: **91** Can regrow itself in new shapes, even after being liquidised! Well, you need to be tough if you have out-lived dinosaurs (sponges are an ancient and successful animal group)! Sponges vary hugely in shape and colour.

# Beadlet Anemone

*Actinia equina*



*Normally dark red in colour though sometimes green or orange. Retracts its stubby tentacles when disturbed or when the tide goes out - leaving what looks like a blob of jelly! Check out its bright blue ring just inside the tentacles. These are specialised stinging cells. Don't poke it too hard!*

**Size:** Up to 7cm.

**Lives:** All over the shore in rockpools, crevices and shaded overhangs.

**Eats:** Feeds on passing fish, shrimps, prawns and zooplankton.

**Eaten by:** Great grey sea slug.

**Special powers: 93** Their mouth is also their bottom! Not special enough for you? Well, how about having specialised stinging cells to fend off annoying neighbours as well as paralyse prey? Oh, and by the way they can clone themselves too! Whoa!

# Snakelocks Anemone

*Actinia viridis*

*Long 'snake-like' tentacles. Two colour varieties - brown-grey or green/purple. Often found in clusters.*

**Size:** Base up to 7cm, tentacles can span 18cm.

**Lives**: Unlike other anemones it doesn't tend to withdraw its tentacles therefore is always found in pools on the rocky shore (middle to lower shore).

**Eats**: Feeds on passing crabs, shrimps, prawns and small fish but can also gain energy from the sun!

**Eaten by**: Great grey sea slug.

**Special powers**: **99** Green and pink tipped ones are green because they contain tiny plant cells living inside the tentacles. This is a symbiotic relationship. The plants (algae) gain protection, whilst the anemone gains 'energy'. It's internal solar power! Snakelocks anemone cells contain a special protein that makes them glow fluorescent green under ultraviolet light. They also have a mouth-bottom and can clone themselves...wow!

# Toothpaste (Keel) tube worm

*Spirobranchus* spp.

*The white calcareous tube is triangular in section.*

**Size:** The tube is up to 3 cm long.

**Lives**: The underside of rocks/boulders on the lower shore is a good place to find them. Also found on shells.

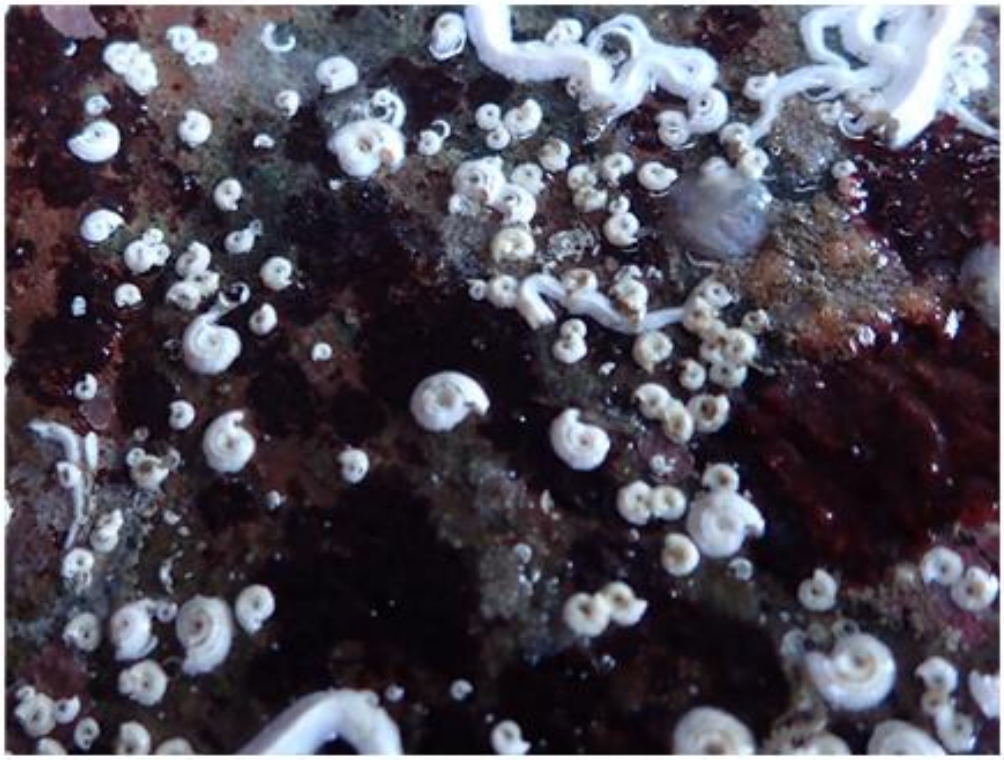
**Eats**: The worm that lives inside is a filter feeder that sticks out its tentacles from the hole to catch its food (plankton mostly and bits floating past).

**Eaten by**: Blennies

**Special powers**: **55** The worm actually builds its own calcareous tube using special glands in its upper body segment.

# Spiral tube worm

*Spirorbis* spp.



*The worm lives permanently inside these white, smooth spiral tubes and is only a few millimetres long and bright orange in colour.*

**Size:** 0.4cm.

**Lives**: Common on the fronds of Serrated Wrack and Bladder Wrack and are also found on the underside of stones in rockpools.

**Eats**: Plankton (small animals/plants living in the seawater) and detritus.

**Eaten by**: Protected by a shell.

**Special powers**: **50** The worm actually builds its own calcareous tube using special glands in its upper body segment. They can breathe across their whole body!

# Honeycomb worm

*Sabellaria alveolata*

*A hard honeycomb structure attached to rocks or man-made structures on the seashore. The reefs are often mound or hummock like. They are distinctively honeycomb in structure, with each tube housing one worm.*

**Size:** They can be up to a metre tall and several metres long.

**Lives**: They need hard substrates to settle on and sand to build their tubes with - so are only found in places where both are plentiful. Mainly lower shore.

**Eats**: Plankton (small animals/plants living in the seawater).

**Eaten by**: Crabs and carnivorous sea snails and worms although the tubes offer good protection.

**Special powers**: **55** Each worm builds itself a protective tube from sand and shell fragments, which together form a reef that looks like honeycomb. Each little hole is like a worm apartment and is where the worm lives and feeds. Each tube even has an overhanging porch! The reefs provide an important habitat for other species.

# Common Prawn

*Palaemon serratus*

*A translucent body with brownish-red tiger stripes along the length. It has large eyes separated by a serrated rostrum (pointed 'horn'). Its walking legs are banded with reddish-brown and bright yellow, and it has very long brown antennae.*

**Size:** Up to 11cm.

**Lives**: In rockpools middle to lower shore and shallow water, normally hiding in crevices or under stones.

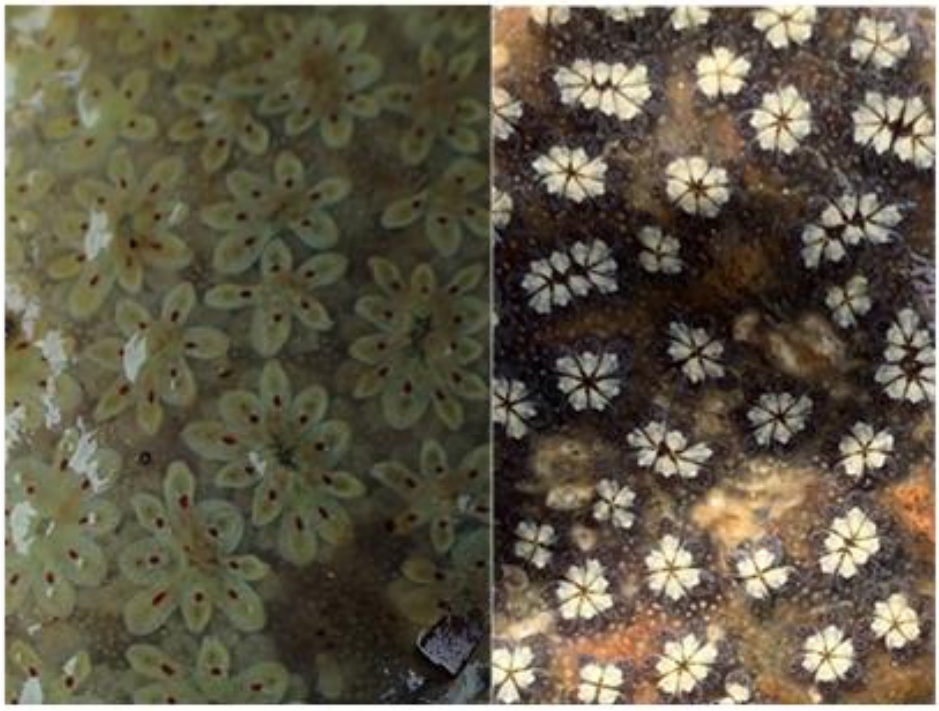
**Eats**: Anything! They are scavengers.

**Eaten by**: Fish, crabs, and birds…and humans!

**Special powers**: **83** Masters of camouflage - both transparent and stripy. And their translucent body allows you to see their last meal!

# Star sea squirt

*Botryllus schlosseri*



*Flat gelatinous but fairly hard sheets spread onto rocks and seaweeds. This is actually a colony of individual sea squirts. Multiple colour varieties.*

**Size:** 10cm or more.

**Lives**: The underside of rocks and under and on seaweeds on the lower shore.

**Eats**: Plankton (small animals/plants living in the seawater).

**Eaten by**: Cowries and other sea snails.

**Special powers: 85** Can be many different colours including green, yellow, violet, orange and red. It looks like a bunch of beautiful flower petals stuck next to each other to form a mosaic of stars. It takes 3-12 individuals to produce one of the star-shaped patterns. The centre of each 'star' is a single shared exhalent siphon.

# Common Star fish

*Asterias rubens*

*It has 5 tapering arms arising from a plump central disc. The surface is covered with a tiny scattering of white spines. Underneath and on the sides are found the numerous tube feet. The body colour is usually a pale orange.*

**Size:** Usual size is around 12 - 20 cm (in sheltered conditions it may grow double this size or even more!).

**Lives**: In the shallows on the seabed and in rock pools.

**Eats**: Worms, animals with two shells (e.g. mussels), sea urchins.

**Eaten by**: Crabs, fish, birds.

**Special powers**: **91** Can grow a whole new arm (yes really!) if one is damaged or sacrificed to escape from prey. Suction pads on their feet are strong enough to pull mussel shells open. Can smell out its prey, and then extend their stomach out of their mouth to dissolve the victim.

# Shore Crab (Green Crab)

*Carcinus maenas*

*They are normally a greenish colour but can be brown, orange or red!*

**Size:** Up to 15cm.

**Lives**: In rock pools, sometimes under seaweed.

**Eats**: Almost anything.

**Eaten by**: Seabirds and larger fish.

**Special powers**: **72** You've got to admit that walking sideways is pretty cool. And they can shed their body (moult) as they grow.

# Broad-clawed Porcelain Crab

*Porcellana platycheles*

*A small greyish brown hairy crab with very large, flattened hairy claws and large whip-like antennae.*

**Size:** Up to 1.5cm.

**Lives**: Common under boulders (look at the rock surface).

**Eats**: They are gentle vegetarians clearing debris and detritus from the rock surface.

**Eaten by**: Fish, birds.

**Special powers**: **73** They have massive claws relative to their body size. All crabs have different sized pincer claws – one is a crusher, the other a cutter (kind of like carrying around your own utensils). Can shed a claw or leg to distract an attacking predator and it will grow back!

# Hermit Crab

*Pagurus spp.*

*The body is reddish brown, soft and asymmetrical - shaped to fit inside spiral-shaped shells. The antennae are long, and the eyes are out on stalks. One pincer (normally the right) is larger than the other. They are often found in periwinkle or whelk shells. There are multiple species.*

**Size:** Up to 3.5cm.

**Lives**: In the shallows on the seabed and in rock pools.

**Eats**: Dead stuff (seaweed and animals). Opportunistic scavengers, feeding on anything they can find.

**Eaten by**: Birds and fish if they catch it outside of its shell.

**Special powers**: **74** Cunning at finding old shells or even bottle tops to live in and then swapping them for larger ones as they grow. Sometimes keep their own pet sea anemone on their shell and give it scraps of food (ahh!) in return for its stinging defence against predators.

# Shanny

*Lipophrys pholis*

*The Shanny is a common blenny you might encounter on the shore. Green with dark blotches providing good camouflage, they have no scales, and the body is soft and slimy. Other blennies are around but they have tentacles on their heads (e.g. Montagu's Blenny in upper shore rock pools which feeds on barnacle limbs). Can bite!*

**Size:** 10-20cm.

**Lives**: If you are lucky, you will find one under a boulder, in a rockpool or even in a deep damp crevice (you can sometimes see their beady eyes!).

**Eats**: Barnacles, shrimps, worms, small fish/crabs.

**Eaten by**: Seabirds.

**Special powers**: **80** Can survive out of water for a short time (amphibious behaviour) and can change colour too (octopuses are not the only camouflage experts!).

# Sea Hare

*Aplysia punctata*


*Large sea slug - colour variable from green to dark red/black. Sometimes with markings.*

**Size:** 7-20cm in length.

**Lives**: Low shore and below the tides.

**Eats**: Seaweeds (body colour varies with what colour of seaweed it eats).

**Eaten by**: Crabs (and fish may have a nibble).

**Special powers**: **90** They are sea snails with a secret inside shell. They have head tentacles that look like hare's ears but act as a nose. They can squirt out purple ink and white slime when disturbed. They lay eggs in long pink threads on seaweed that look like pink spaghetti.

# Sand Hopper

*Talitrus saltator*

*Sand hoppers are greyish-cream in colour with one antenna noticeably thicker than the other. Their flattened body helps them to fit into many spaces.*

**Size:** Up to 2cm.

**Lives**: On the beach at the high tide mark in the strand line.

**Eats**: Rotting seaweed.

**Eaten by**: Mainly birds.

**Special powers**: **79** Burrows deep into the sand every day, sneaking out to feed in the evening. Jumps in a crazy manner to confuse predators. May be small but they can jump an amazing 30cm!

# Springtail

*Anurida maritima*

*Small wingless insects with a deep blue-black colouration due to the dense, velvet-like covering of hair, which repels water.*

**Size:** 0.4cm

**Lives**: Float on surface tension of rockpools. Often found in large groups on still water.

**Eats**: Detritus. They are scavengers finding their food by scent.

**Eaten by**: Fish, birds, anemones.

**Special powers**: **84** Scuba diving insects! Small hairs on their body trap air forming their own air bubble supply that they can use to survive for up to 2 days underwater. They know their tides as they have a clever internal body clock that is in tune with the tidal cycle.

# Black Tar Lichen

*Verrucaria maura*

*Forms a thin, matt-black layer on rock surfaces. Tar lichens get their common name from the fact that they form great swathes of dark smudges on rocks, giving the rock an impression of being covered in crude oil from an oil spill.*

**Size:** 0.1cm. Hard to tell where they start and finish!

**Lives:** High up the shore in the 'splash zone' above barnacles/limpets and below yellow/orange band of lichens.

**Eats:** The algal partner in a lichen gains energy from the sun and the fungal partner gathers nutrients. It's complicated but is obviously a good arrangement as lichens are very successful.

**Eaten by:** Apparently edible to grazing animals (sea snails) after softening by water.

**Special powers: 75** Lichens are partnerships of different organisms that are so successful they have been around for 400 million years. Growth is very slow, and some species of lichen may survive for hundreds of years.

Ardal Cadwraeth Arbennig Pen Llŷn a'r Sarnau Special Area of Conservation

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