



SIERRA
CLUB BC

EXPLORING

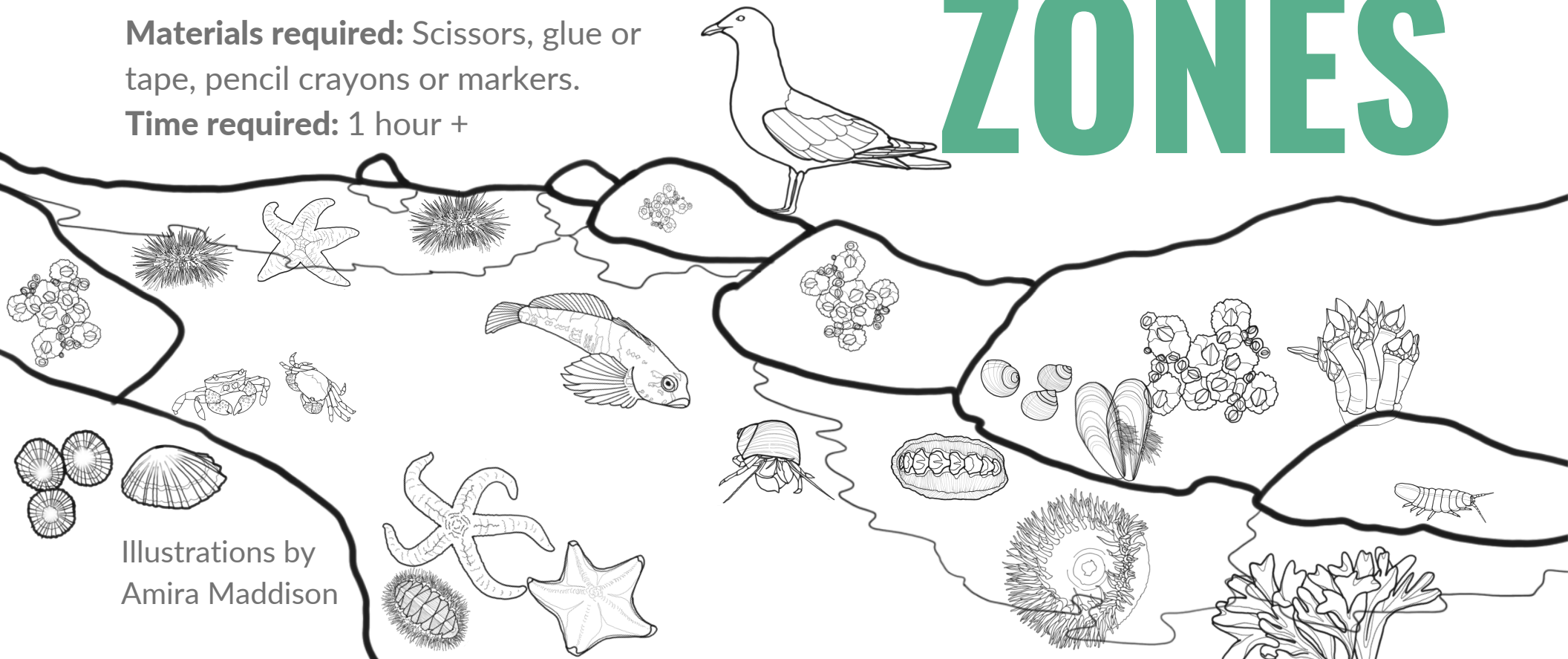
INTERTIDAL ZONES

Suggested age range:

Grades K-5

Materials required: Scissors, glue or tape, pencil crayons or markers.

Time required: 1 hour +



Illustrations by
Amira Maddison

PACIFIC NORTHWEST COAST INTERTIDAL ZONES AND SPECIES

This activity will help you discover the variety of species that call the intertidal zones in B.C. home.

How to:

To create your own intertidal poster, print this document single-sided. Read about the cool beings and colour them in (use a book or internet search and try to colour accordingly). Glue or tape page 9 and 10 together to form the poster base. Then cut out the coloured pictures of the different species and glue them onto the poster, according to the intertidal zone in which they are found.

What is the tide?

- High and low tide are caused by the gravitational pull of the moon.
- The tidal force causes the earth and the water to bulge. These bulges of water happen during high tides.
- High tide occurs in two places at once: 1) on the side of the earth closest to the moon because it experiences the moon's pull the strongest. 2) on the side of the earth facing away from the moon because of earth's rotational pull is stronger than the moon's gravitational pull. Everywhere else on the earth the ocean recedes to form low tide.
- The cycle of two high tides and two low tides occurs within a 24-hour span in most places on coasts around the world.

What is the intertidal zone?

The intertidal zone is the place between high tide and low tide. It is the place where living beings must be able to survive through both dry spells and big waves. Explore beings that live in the three intertidal levels (upper, mid, and low tidal) on the next pages!

DID YOU KNOW?

King tides (a non-scientific term) are exceptionally high tides. They are predictable, typically occurring during a full or new moon (when the moon is closest to the earth).

UPPER TIDAL

The upper or high tidal zone is covered only by the highest tide. It is the part of the shore closest to the forest.

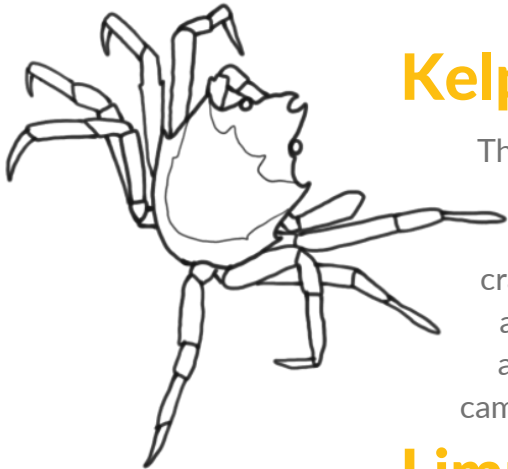
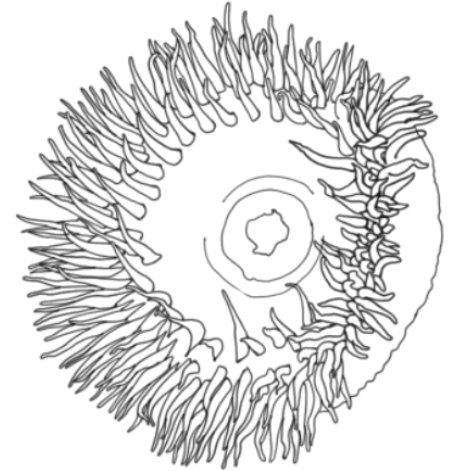


Acorn barnacles

These are crustaceans that cement themselves in place. There is a little arthropod (jointed-legged animal) living inside that cone-shaped shell! Barnacles stand on their heads and shovel food into their mouth with their legs!

Sea anenomes

Sea anemones have rings of tentacles surrounding their mouths. The tentacles have stinging cells on them that will immobilize their prey such as crabs, fish, sea stars and sea jellies.

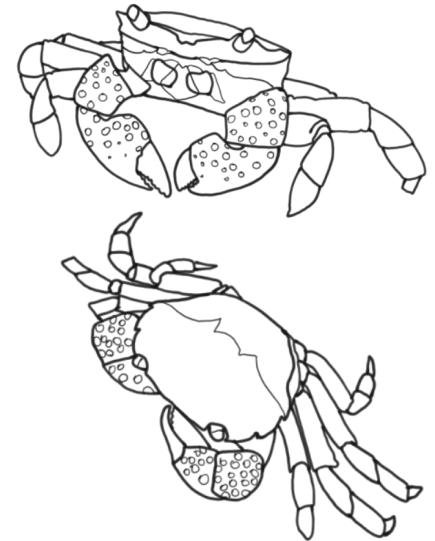


Kelp crab

These crabs are in a large group of crabs called spider crabs. Younger crabs may be olive-green as well as red or brown, and adults are brown to camouflage well with kelp.

Purple shore crab

Purple shore crabs have purple spots on their pincers. They vary in colour from purple, dark olive, red and brown. They are easily found on and under boulders, where they like to group. They mostly feed on green algae.



Limpets

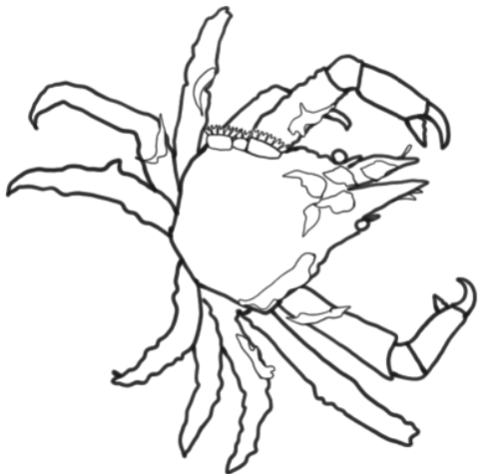
Limpets are cone-shaped, one-shelled snails found living in eelgrass, kelp and on rocks. They scrape the algae off the rocks for food.

UPPER TIDAL



Gooseneck barnacles

Gooseneck barnacles are filter feeding crustaceans that have a long protruding neck that looks like the neck of a goose! They live attached to rocks. Some people consider them a delicacy.

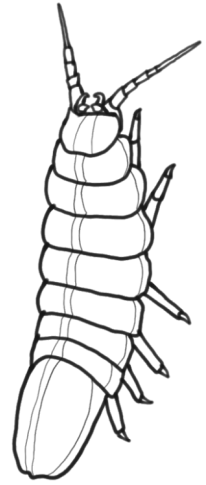


Decorator crab

Decorator crabs are opportunistic artists! They attach seaweed, rocks and coral to their hooked bristles on the backs of their shells to camouflage and protect themselves from predators.

Isopod

Isopods are green crustaceans with 7 pairs of legs. They mostly eat algae.



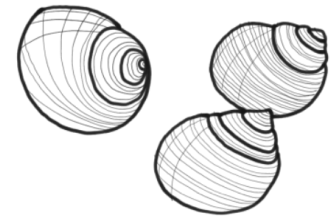
Sea lettuce

Sea lettuce is found on the rocks. It has light to medium grass-green blades and is only 2 cells thick. It grows in both high and low intertidal zones, attached to rocks, pebbles, shells, and bits of wood. It may detach and float around, often collecting in tide pools and washing up on beaches.



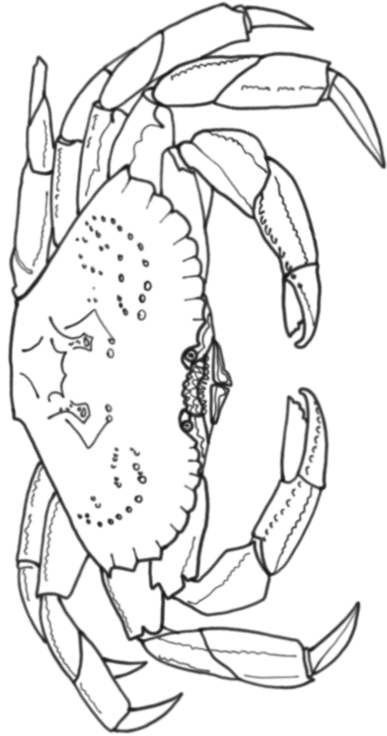
Periwinkle sea snail

This small mollusk moves around on its muscular foot. It lives in sheltered waters on rocks amongst the algae.



MID TIDAL

The mid tidal zone is exposed at low tide. It is both wet and dry throughout the tidal cycles.

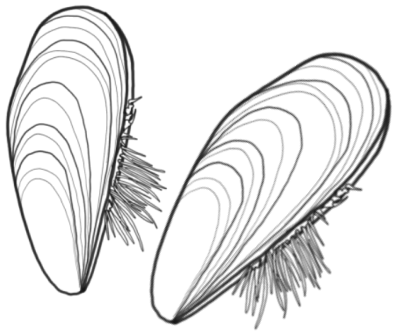


Dungeness crab

These crabs scavenge along the sea floor for organisms that live partly or completely buried in the sand. Their diet can include bivalves, worms, shrimp, fish, and small crabs.

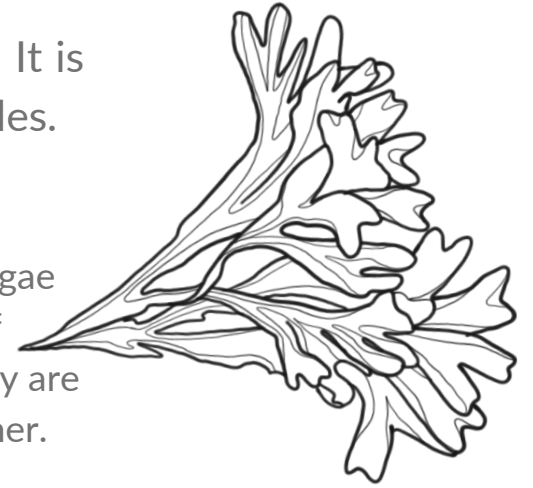
Mussels

Mussels can filter 2-3 litres of water an hour! They do this to feed and breathe. California mussels are a marine bivalve mollusk that grows in very large groups. They can grow to full size (up to 130 mm in length) in 3 years. They are greyish-black in colour. Some predators such as the sea star find it incredibly difficult to open-up their hard shells.



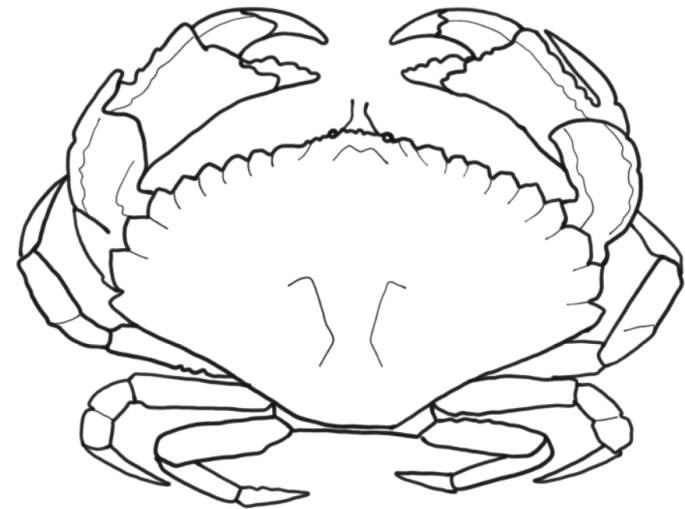
Rockweed

Rockweed is a brown algae and is a favorite food of periwinkle snails, so they are frequently found together.



Red rock crab

Red rock crabs have black-tipped pincers. Their shells range in colour from light to dark red and they look like big red rocks when hidden in the sand. Their shells reach a width of 15cm across.

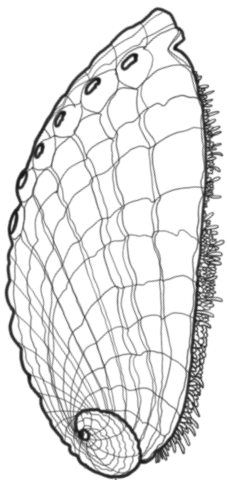


MID TIDAL



Turkish Towel

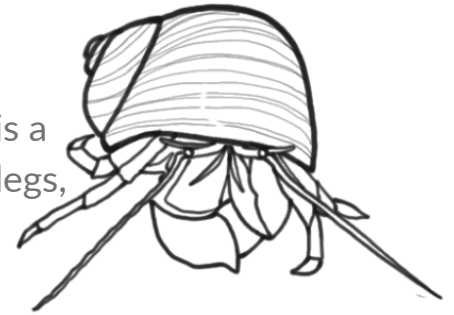
Not really used by Turkish people as a washcloth, this species of red algae has a surface texture like such a cloth. Turkish Towel is a red seaweed that is coarse to touch. They can be red to purple in colour and iridescent when wet.



Abalone

Abalone are known for their metallic colours of blues, greens, reds and purples. They only travel a few hundred metres over their lifespan of approximately 50 years!

Hermit crab



Like all crabs, the hermit crab is a decapod — it has five pairs of legs, including a pair of claws. The hermit crab uses its claws for defence and food shredding as well as eating. The second and third pairs of legs help the crab walk, and the last two pairs hold the hermit crab in its shell. A hermit crab does not create its own shell. It moves into larger shells as it grows — fighting with other hermit crabs for the shells if necessary — but it doesn't harm healthy snails.

Sculpin

Sculpins typically inhabit tide pool and intertidal habitats. They are bottom-dwellers and some spend their whole lives in one tide pool! As the tide recedes some sculpins become stranded under rocks and logs. Fortunately for them, they have the ability to extract oxygen directly from the air and survive for several hours if kept wet.



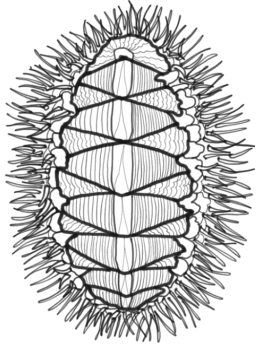
LOW TIDAL

The low tidal zone is only exposed at the lowest tide.



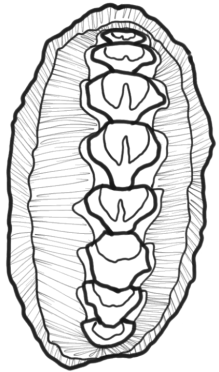
Moon Jelly

Moon jellies look like bells. They are translucent grey to blue in colour. They use short tentacles to sweep food toward the mucous layer on the edge of the 'bell'.



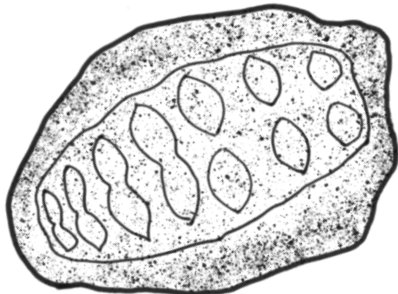
Mossy chiton

Chitons have a broad flat foot which they use to move and to stick to their rocky homes. Mossy chitons are covered by small interlacing plates with stiff mossy dark brown hairs. The inside of their shells are a turquoise colour.



Black Katy chiton

Black Katy chitons are oval and are made up of 8 white jointed plates. The underside of their shells and foot are pinkish-red or orange-red. They cling to the rocks and hide in the shadows and beneath seaweed.



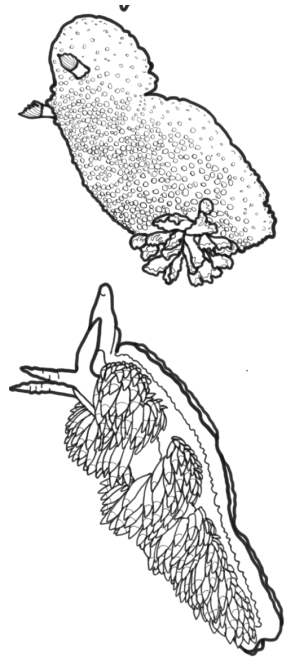
Gumboot chiton

Gumboot chitons are the largest chitons in the world, growing up to 36cm! They can be detected using a metal detector because they have two rows of sharp teeth covered in magnetite, an iron ore. They use this to scrape algae off rocks.



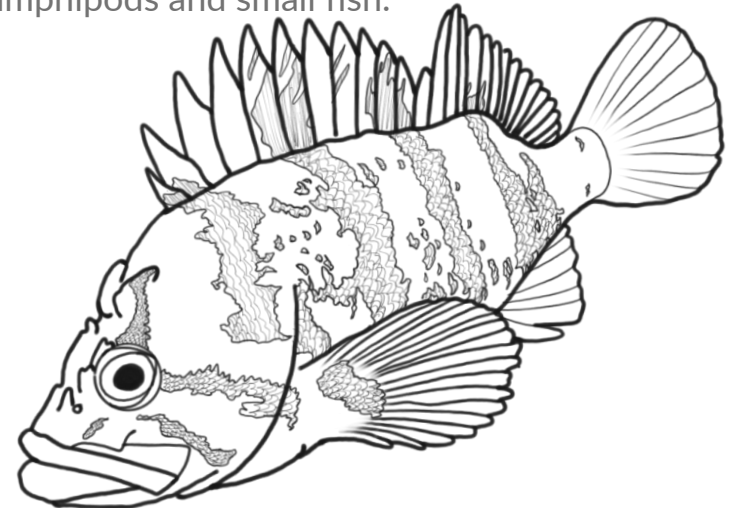
Nudibranchs

Nudibranchs are known as sea slugs or naked gills. They are really great at camouflaging as they retain the colour of the food they eat. Some even keep the foul-tasting poisons of their prey and secrete them as a defense against predators.



Tiger rockfish

Tiger rockfish are striped like a tiger with pink or red stripes. They can grow up to 60cm long. These fish are solitary and sometimes territorial! They prey on rock crabs, amphipods and small fish.



LOW TIDAL

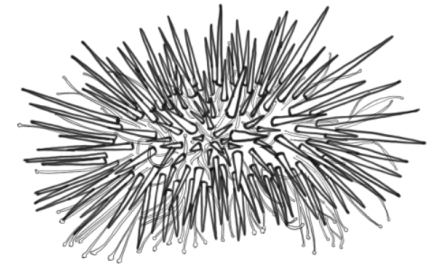


Kelp

Kelp provides great habitat and nutrients to a variety of marine species. Sea otters wrap themselves up in the kelp stems while sleeping to prevent themselves from drifting away.

Purple sea urchin

Purple sea urchins are covered in pincers, tube feet and deep purple spines. They use their spines for protection from predators and for getting food in the kelp forest. If food lands on an urchin's back, all those tube feet pass the food down to the urchin's mouth like a bucket brigade! Sea urchins are a main food source for the sea otter.



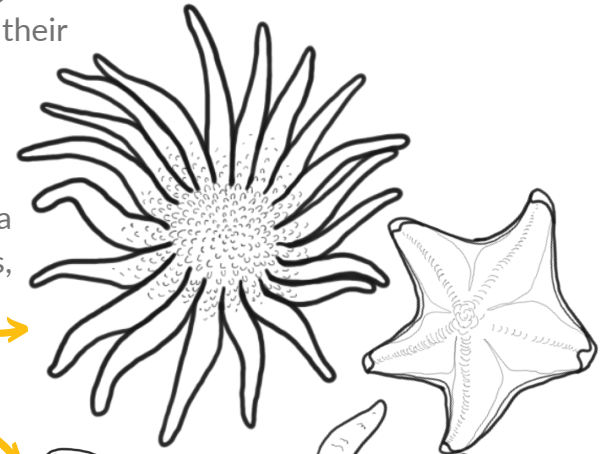
Plumose anenome

Plumose anenomes are also known as white plummed anenomes. They can be many shades of white, cream, brown, orange or tan. They sweep the passing water with their tentacles to collect food.



Sunflower star

These beings are carnivorous. They eat sea urchins, clams, crabs, snails, sea cucumbers, sand dollars, chitons and dead fish.



Ochre sea star

The ochre sea star is a keystone species in the Pacific Northwest coastal waters, meaning that many species depend on it. It eats many mussels, freeing up space on rocks for other beings. It has five arms covered with tiny tube suction cups and can regrow a lost arm within one year.





FOREST

UPPER TIDAL





MID TIDAL

LOW TIDAL