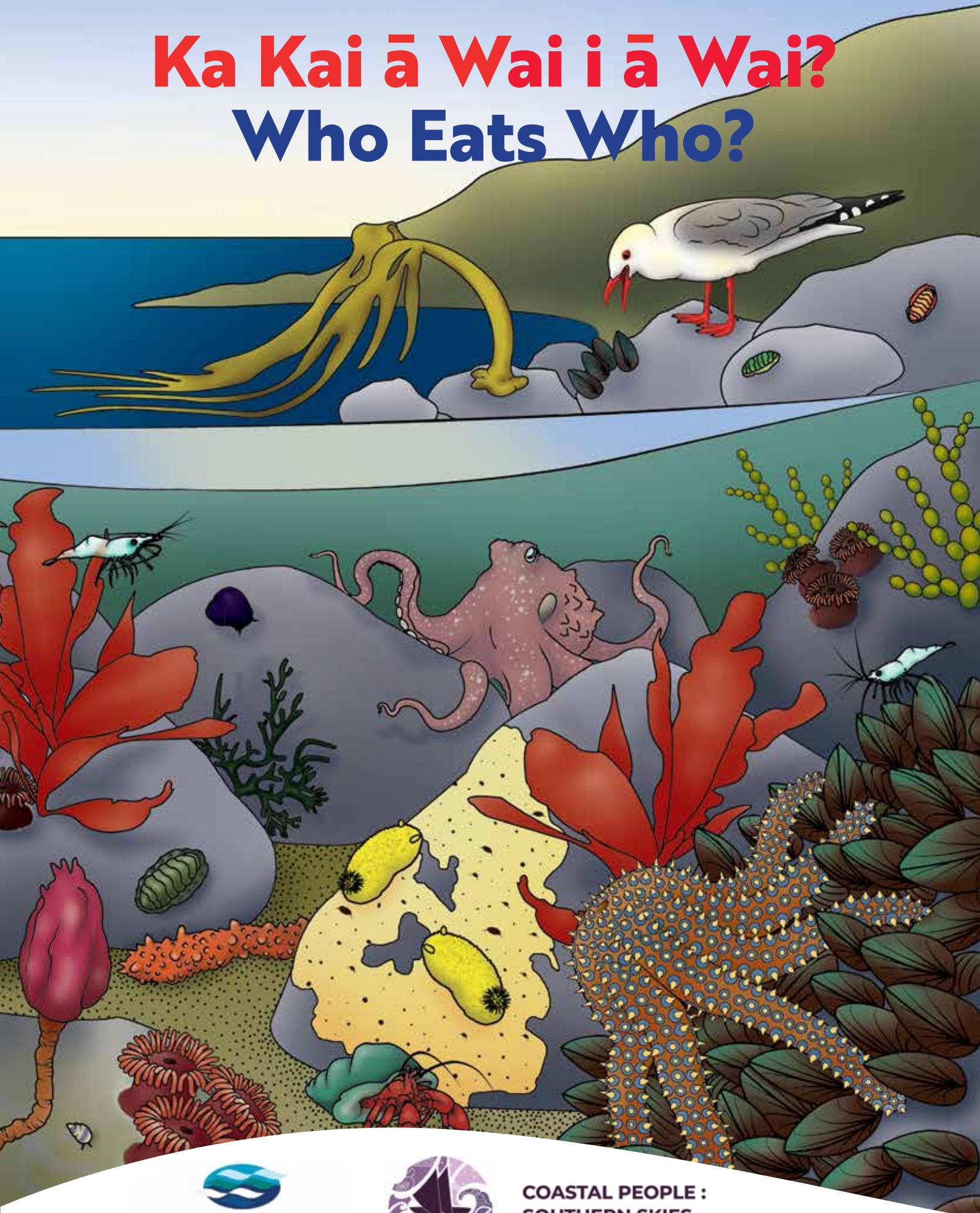


Te Ākau Pōhatuhatu
The Rocky Shore

Ka Kai ā Wai i ā Wai? Who Eats Who?



NEW ZEALAND
MARINE STUDIES CENTRE



COASTAL PEOPLE :
SOUTHERN SKIES

Centre of Research Excellence



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Ngā karahe o ngā ākau pōhatuhatu o Aotearoa

He kōrero mā ngā kaiako me ngā mātua. He puka mahi tēnei e hāngai ana ki ngā kararehe me ngā tipu e ora ana i ngā ākau pōhatuhatu o Aotearoa. Ko ngā pikitia ēnei e whakaatu ana i ngā kai a ngā kararehe, i ngā āhuatanga kohi kai, me ā rātou rautaki hei huna mai i ngā kōnihi hoki. He mea akiaki i ngā tamariki ki te whakaahua i ō rātou whakaaro mo ngā pikitia, ā, he aha hoki ētehi o ngā āhuatanga e whai pānga ana ki ēnei e ora nei ki ngā ākau pōhatuhatu o Aotearoa. He kohinga kōrero anō kei te whārangi whakamutunga o te puka mahi nei mō ngā kararehe rerekē. Mā te waihanga i tētehi tukutuku kai e matatau ai ngā tamariki ki ngā kararehe rerekē e noho ana i te taiao o te moana. Ko ētehi kaupapa hei wānanga ake mā koutou ko ngā āhuatanga e panoni ai ngā tukutuku kai a ngā kararehe, he aha hoki i pērā ai. Ka tāea e ngā tamariki ētehi pikitia te tā hei whakaatu i ō rātou whakaaro hei tiaki, hei whakarauora i tēnei momo taiao.

E whakaae ana kia whakamahia ngā pikitia i te pukapuka nei mo ngā whakaakoranga anake.

Ka hono atu te Whare Mātai Moana o Aotearoa ki te Te Tari Pūtaiao Taimoana o Ōtākou Whakaihu Waka, ka whakaahua rātou i te oranga taimoana o ngā wai o Aotearoa ki te Tonga, ā, ka whakapuaki i ngā mātauranga e hāngai ana ki te taiao taimoana o Aotearoa. Ko te take matua o te kaupapa nei kia matatau ngā tamariki ki ngā āhuatanga o te taiao taimoana. Whakapā atu ki te Whare Mātai Moana o Aotearoa pēnā he pātai anō ā koutou.

He kōrero anō mō ngā mahi o Coastal People: Southern Skies ki te whārangi ipurangi o cpss.org.nz.

Creatures of the NZ rocky shore

Information for Teachers and Parents. This educational colouring book features the animals and plants found between the tides on New Zealand's rocky shores and in shallow coastal waters. The illustrations show diet, feeding strategies, adaptations to find and capture food and avoid predators. Children should be encouraged to interpret what is happening in the scenes and predict what might happen next. Further information about a selection of the creatures can be found at the end of this book. Creating a food web will highlight the role of these creatures in the ocean environment. Further discussion topics include factors that could change their food web or affect the animals' ability to find or catch their dinner. Children could then make a poster to illustrate their ideas of what they could do to look after this unique environment.

The illustrations in this book may be copied for educational purposes.

The New Zealand Marine Studies Centre, part of the University of Otago's Department of Marine Science, provides expert knowledge and education about New Zealand's marine environment. The educational programmes involve students in the excitement of scientific discovery, help them develop knowledge and skills, and encourage individuals to take responsibility and action for the future of our ocean resource. Contact the NZ Marine Studies Centre for further information about the range of educational programmes and resources available for schools and interest groups.

The publication of this book has been supported by Coastal People: Southern Skies. For more information about their work see: cpss.org.nz.

I waihangatia tēnei puka karakara e ngā kaimahi
o te Whare Mātai Moana o Aotearoa.
Nā Corlis Schneider ngā pikitia, nā Tessa Mills i whakaemī,
ā, nā Rangiiria Barclay-Kerr i whakamāori.

This educational colouring book was conceived by staff
at the New Zealand Marine Studies Centre.
It was illustrated by Corlis Schneider, edited by Tessa Mills
and translated into te reo Māori by Rangiiria Barclay-Kerr.

NGĀ ĀKAU PŌHATUHATU O AOTEAROA

Ka kai ā wai i ā wai?

Tūhuratia ngā kararehe rerekē e noho ana ki waenganui i ngā tai o ngā ākau pōhatuhatu o Aotearoa.

Karakara i ngā pikitia, ā, me rapu tiwhirī e mōhio ai koe ki ā rātou kai, ārātou rautaki rapu kai, me ā rātou rautaki huna hoki.

Hangaia tētehi tukutuku kai kia matatau koe ki ngā kararehe me ngā tipu o te moana.

NEW ZEALAND'S ROCKY SHORE

Who eats who?

Discover the creatures that live between the tides on the rocky shore and in the shallow coastal waters of New Zealand.

Colour the pictures and gather clues about what they eat, how they catch their food and avoid their predators.

Create a food web to understand the importance of these plants and animals in the ocean environment.

Hupa Meroiti

Plankton Soup

Ko ngā meroiti ngā kai matua o ngā kararehe o te moana. He nui noa atu ngā kai o ngā kararehe o te moana, ēngari ka pēhea tā rātou hopu i ēnei kai?

Tiny PRODUCERS (phytoplankton) and animals (zooplankton) form the base of the food chain in the ocean. Sea creatures have food all around them, but how do they catch it?

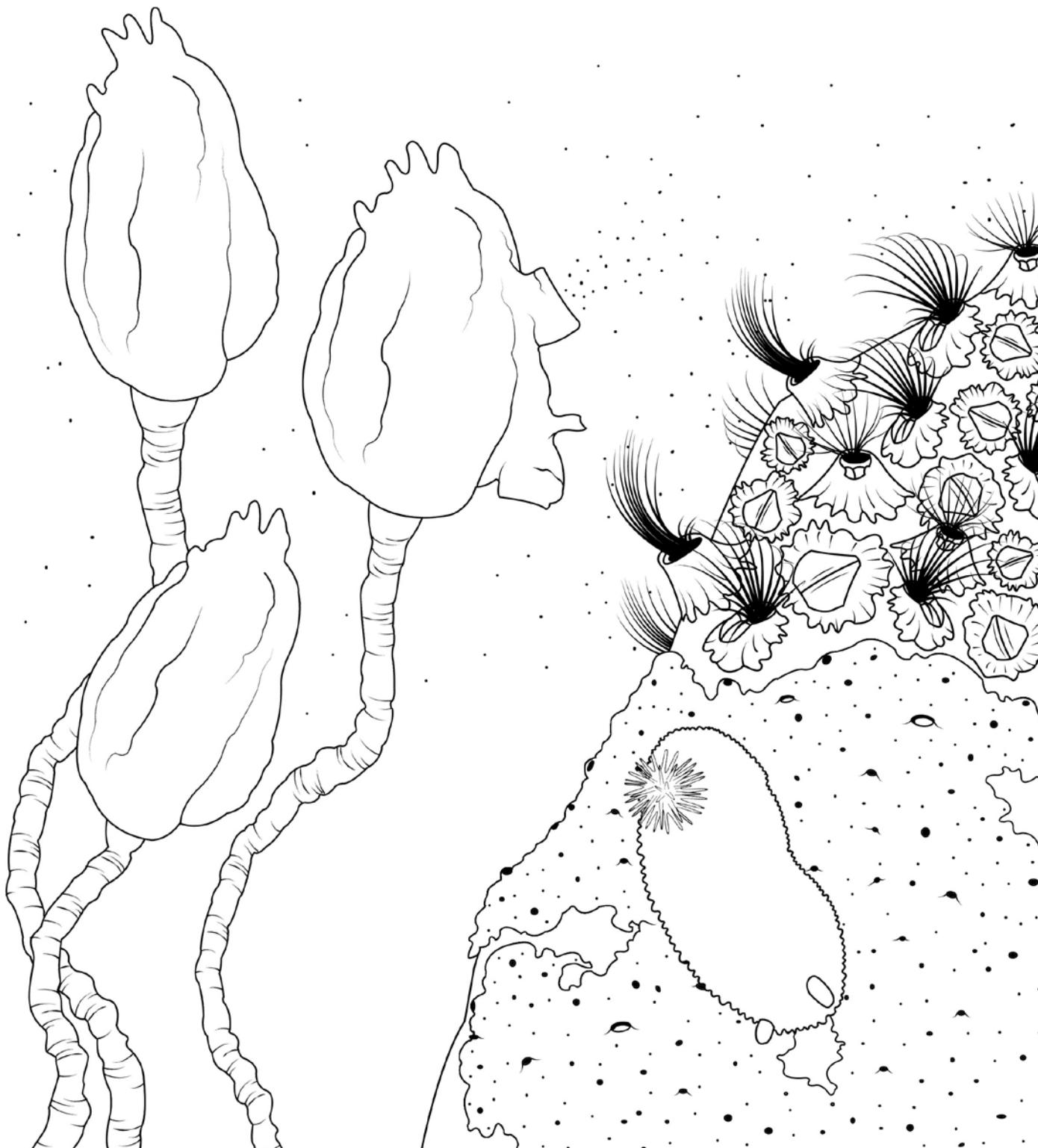


Kararehe Tātari

Filter Feeders

He waewae iti tō ngā tiotio hei hopu i ngā meroiti. Ka ngongo ake ngā kāeo i te wai ki roto i te tomokanga kotahi, ā, ka rere ki roto i tētehi tātari ki te whakawehe i ngā meroiti mai i te wai, nā, ka panaia te wai ki waho i tētehi tomokanga rerekē.

Barnacles have tiny feet that they kick out to trap and filter plankton. Sea tulips suck water into one opening, pass it through a sieve to filter out the plankton and then push the water out of another opening.



Ngā Rimurimu **Seaweeds**

He kaiwhakaputa ngā rimurimu. Ka whakamahia e rātou ngā hīhī o te rā ki te whakatipu kai mo ngā kararehe maha o te moana pērā tonu ki te kina. He kākāriki ētehi rimurimu, hēoti, ko ētehi atu he whero, he parāone ngā tae.

Seaweeds are PRODUCERS. They use the sun's energy to grow and provide food for many marine animals like kina. Some seaweeds are green but others are brown or red.



Ngā Kaitītongi Grazers

He kaimanga ngā kaitītongi. Kei te kite koe i te rori pango, i te pāua, i ngā papatua, i ngā kākahī, i ngā ngaeti me ngā māhi i tēnei pikitia? Ka rapirapi rātou i ngā kōhatu ki ō rātou ārero roa hei tango haere i ngā rimurimu.

Grazers are the vegetarians of the rocky shore. Can you find the black duck's bill limpet, paua, chitons, limpets, periwinkles and top snails in this picture? They scrape seaweed off the rocks with their long zipper-like tongues.

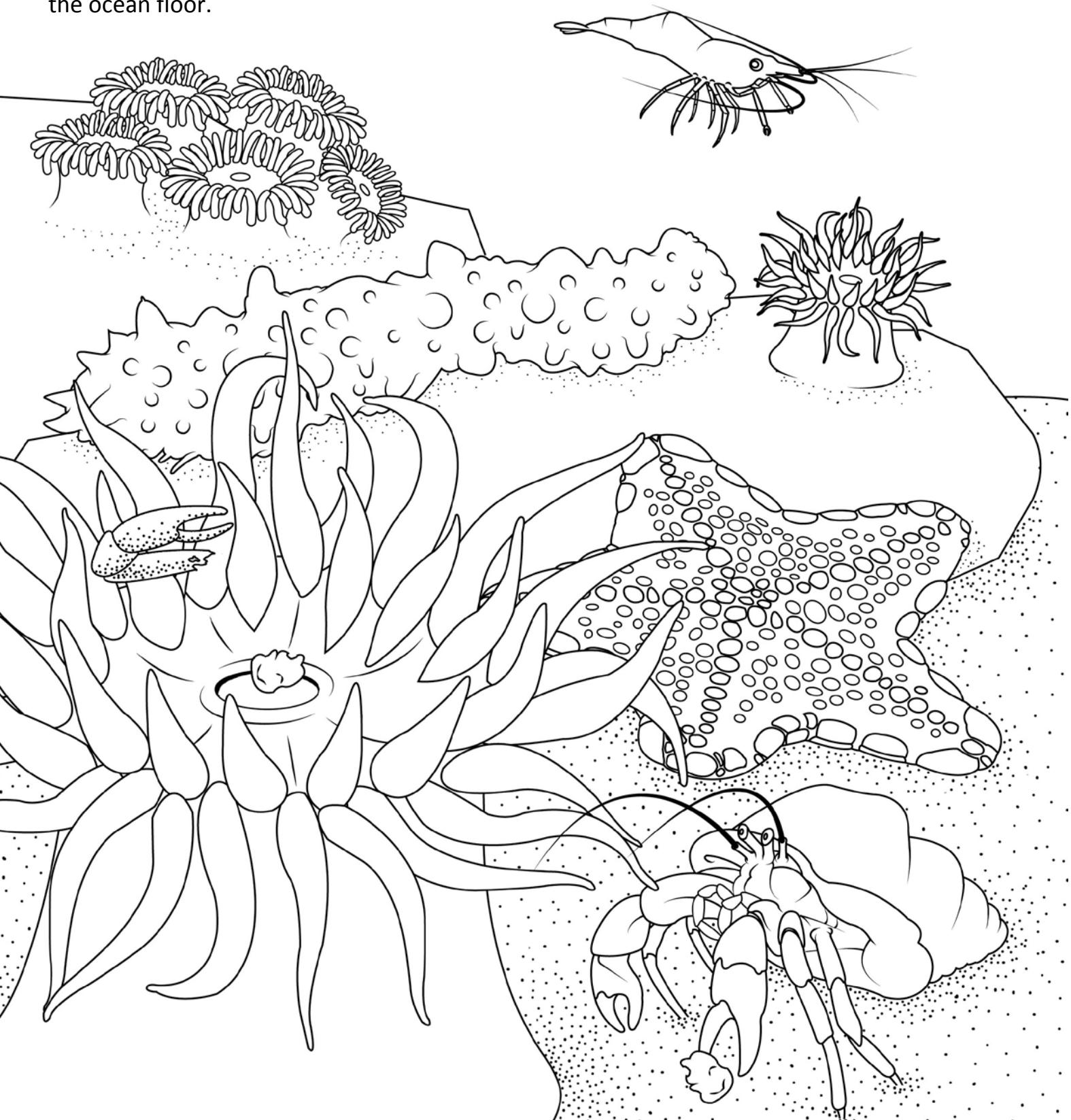


Ngā Hamuhamu

Scavengers

He tāpua ēnei kaikohi rāpihi mo te oranga o te moana. Ka kainga e ngā waerau, nga kōtore moana, ngā rori, ngā kōuraura me ngā papatangaroa i ngā tipu kua mate, ā, e takoto noa ana i te papa o te moana.

These rubbish collectors - or recyclers - play an important role in the sea. Hermit crabs, sea anemones, sea cucumbers, shrimp and some sea stars eat the dead plants and animals left on the ocean floor.

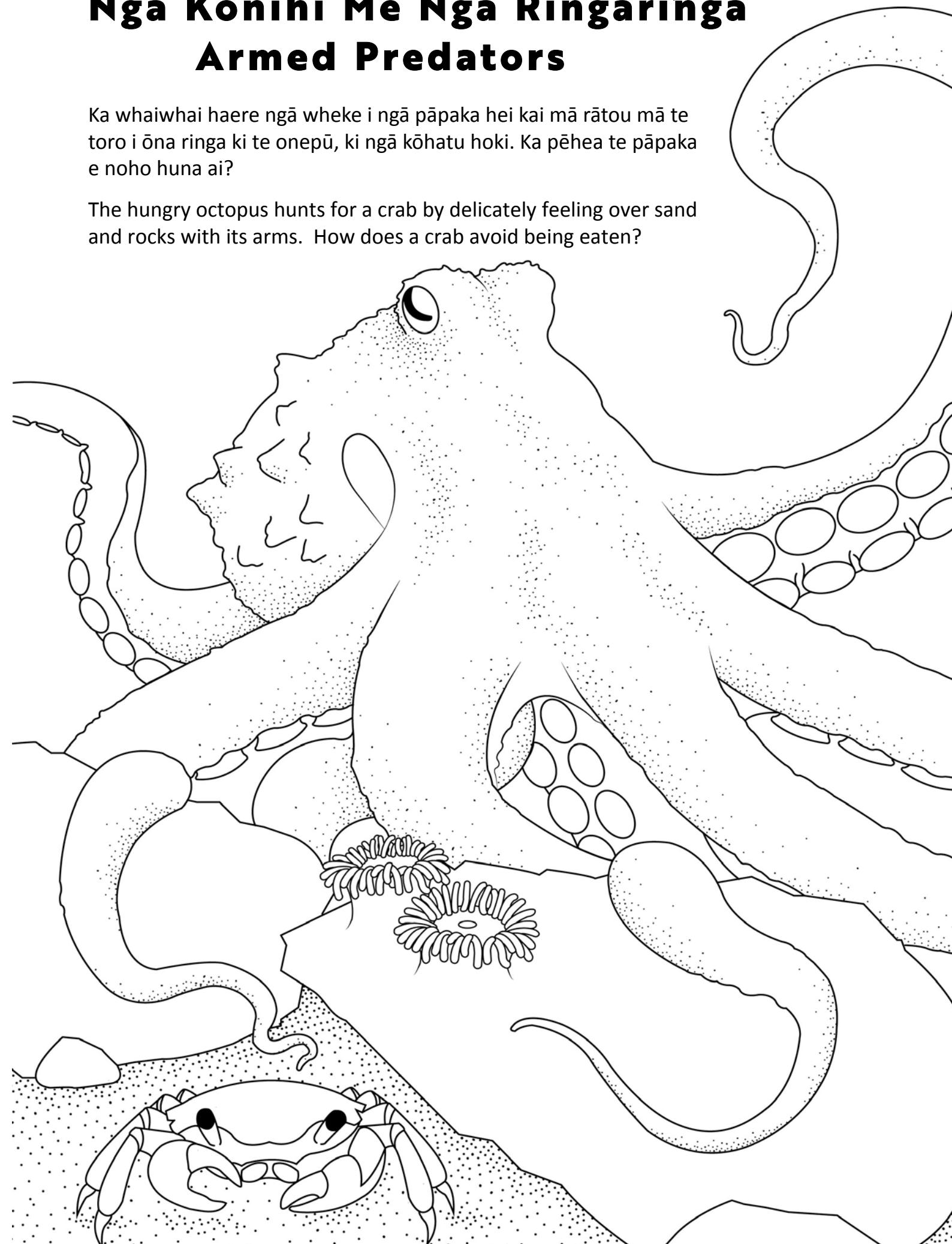


Ngā Kōnihi Me Ngā Ringaringa

Armed Predators

Ka whaiwhai haere ngā wheke i ngā pāpaka hei kai mā rātou mā te toro i ōna ringa ki te onepū, ki ngā kōhatu hoki. Ka pēhea te pāpaka e noho huna ai?

The hungry octopus hunts for a crab by delicately feeling over sand and rocks with its arms. How does a crab avoid being eaten?



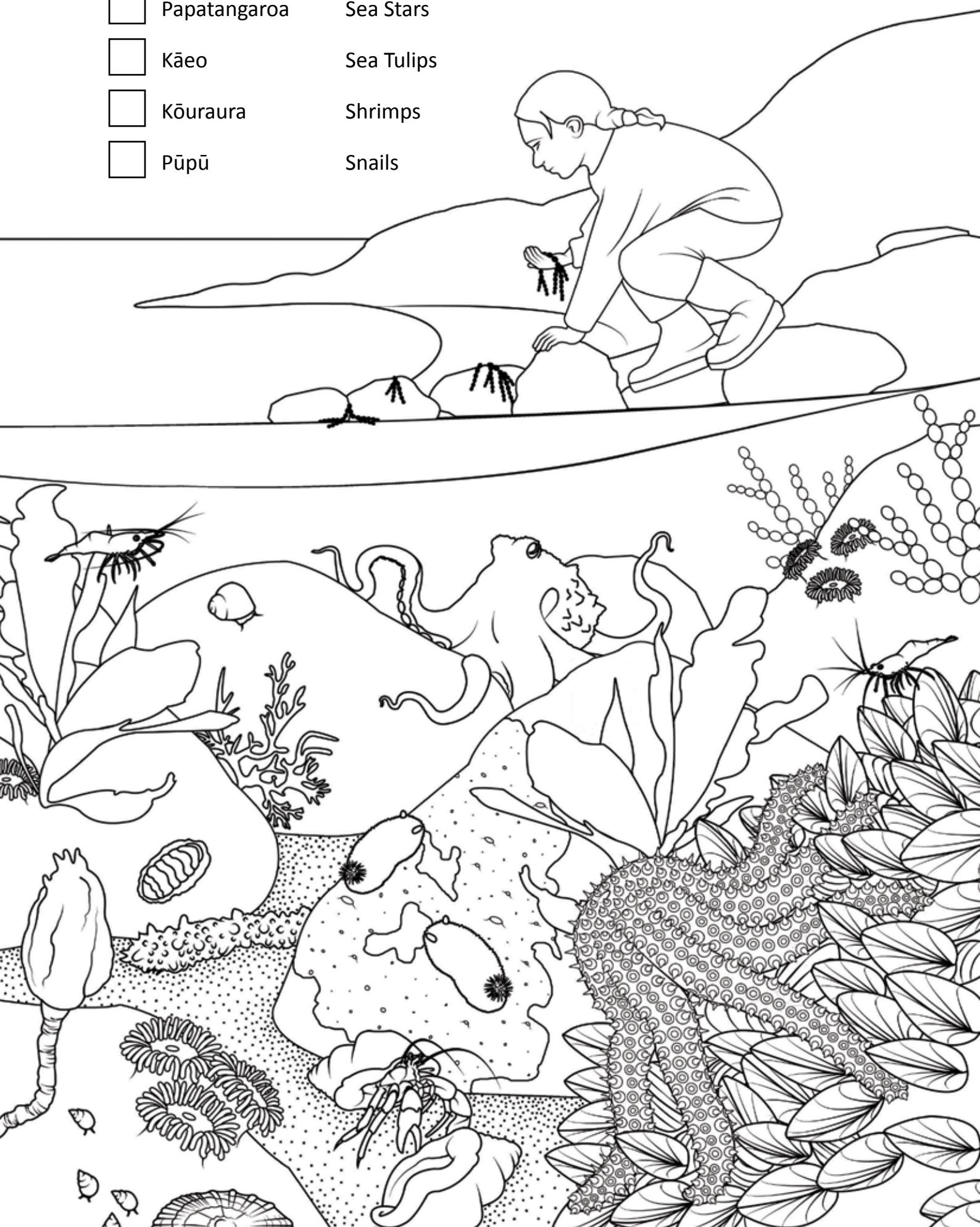
He mea hou i ngā wā katoa hei tirotiro mā tātou i te takutai moana. E hia ngā kararehe ka taea e koe te kite i te pikitia nei?

Every time you visit the rocky shore you discover something new! How many creatures can you find in the picture?

<input type="checkbox"/>	Kōtore Moana	Anemones
<input type="checkbox"/>	Papatua	Chitons
<input type="checkbox"/>	Pāpaka	Crabs
<input type="checkbox"/>	Tarāpunga	Gulls
<input type="checkbox"/>	Piha-kau	Nudibranchs



<input type="checkbox"/>	Wheke	Octopus
<input type="checkbox"/>	Papatangaroa	Sea Stars
<input type="checkbox"/>	Kāeo	Sea Tulips
<input type="checkbox"/>	Kōuraura	Shrimps
<input type="checkbox"/>	Pūpū	Snails



Ngā Kōnihi Ika

Fishy Predators

Tēnā pea ka kainga e koutou te ika rāwaru, ēngari he aha hoki tāna kai? E rata ana ngā ika rāwaru ki ngā pāpaka. He aha te āhua o te huna o te pāpaka i te pikitia nei?

You might eat blue cod for your tea, but what does the blue cod like to eat?
Crabs are a favourite. How is the crab in this picture hiding?



Ngā Kōnihi Whai Niho

Predators With Teeth

Ka kitea ngā mango whāriki i ngā takiwā kōhatuhatu e tata ana ki te ākau. E rapu ana rātou i ngā pāpaka me ngā pūpū.

Carpet sharks are found in rocky areas near the shore. They are looking for crustaceans and molluscs.

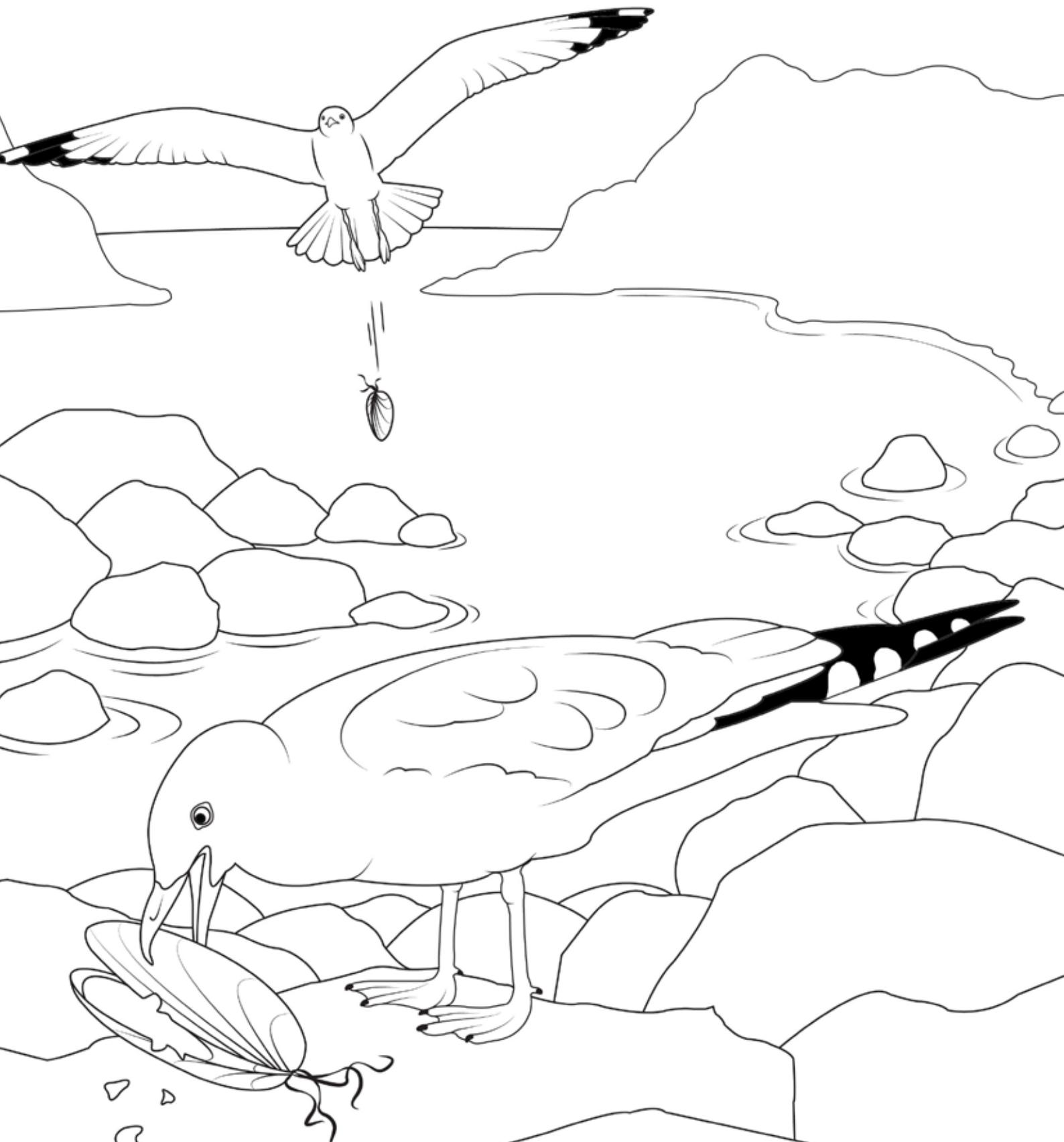


Ngā Kōnihi Manuhiri

Visiting Predators

E rata ana ngā tarāpunga ki ngā mātaitai kaiota, eaoia, he uaua hoki te kuhu o te ihu ki ngā angaanga. Ka pēhea tā rātou pakaru i te anga kia tāea ai e rātou te kūtai te kai?

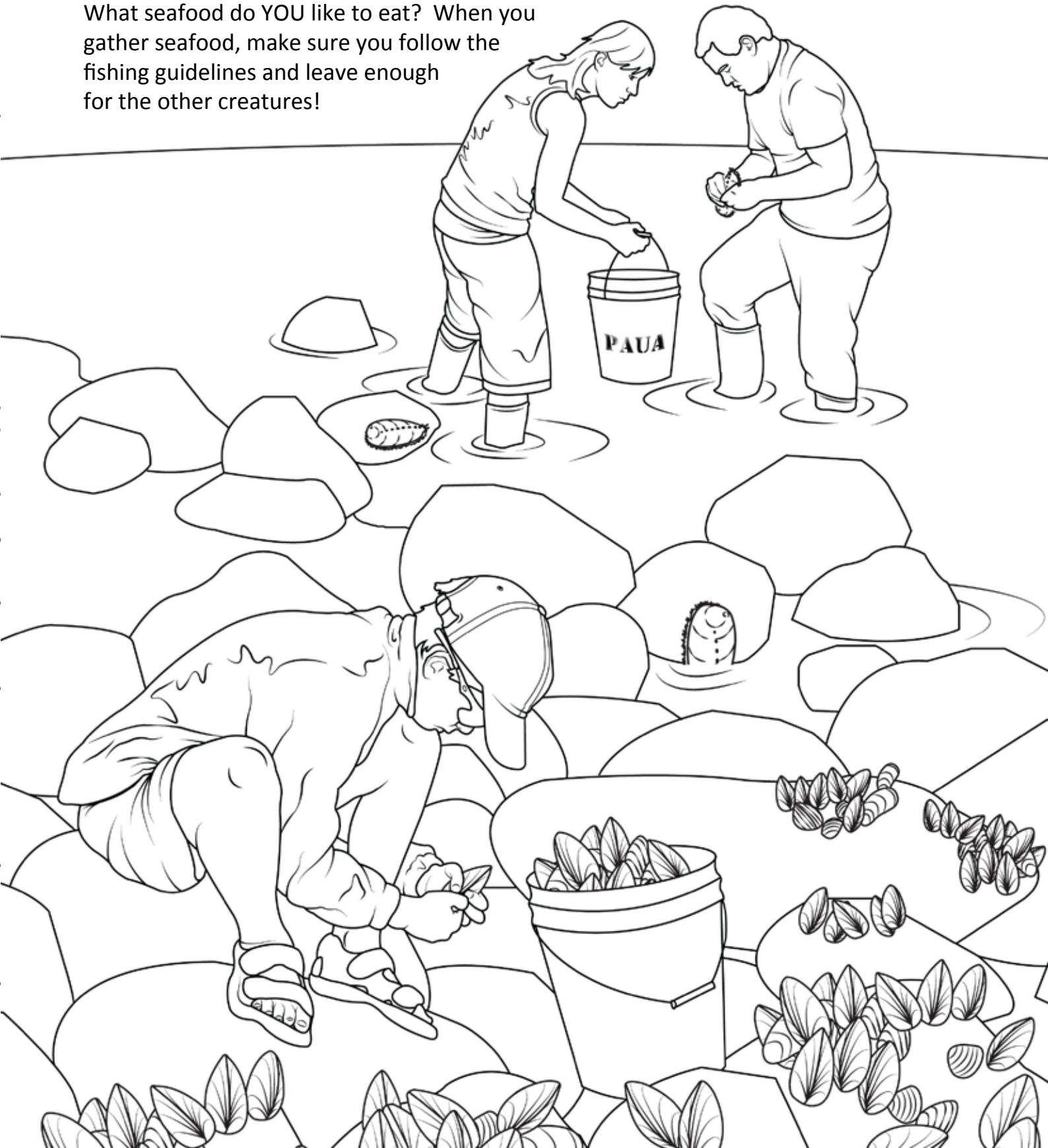
Gulls like fresh shellfish but find it difficult to get into the closed shell. How do they break the shell so they can eat the mussel?



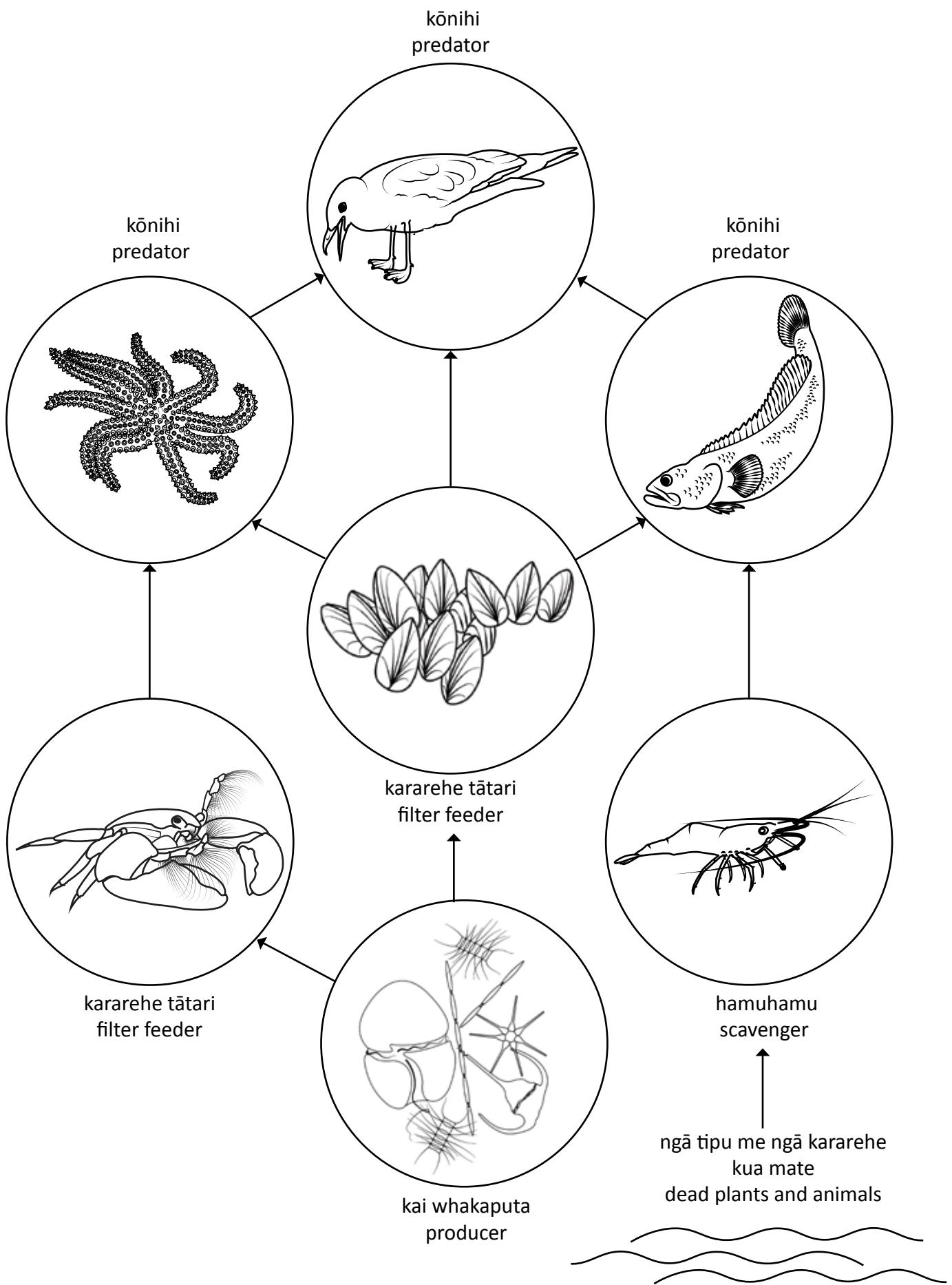
Ngā Kaikohikohi Human Gatherers

He aha te kaimoana reka rawa ki a KOE? I a koe e kohi kai moana ana, me mātua whai i ngā ture hī ika, i ngā ture kohi kai moana, ā, kia tāea tonu ai e ngā kararehe o te moana te rapu kai mā rātou.

What seafood do YOU like to eat? When you gather seafood, make sure you follow the fishing guidelines and leave enough for the other creatures!



Tukutuku Kai Food Web

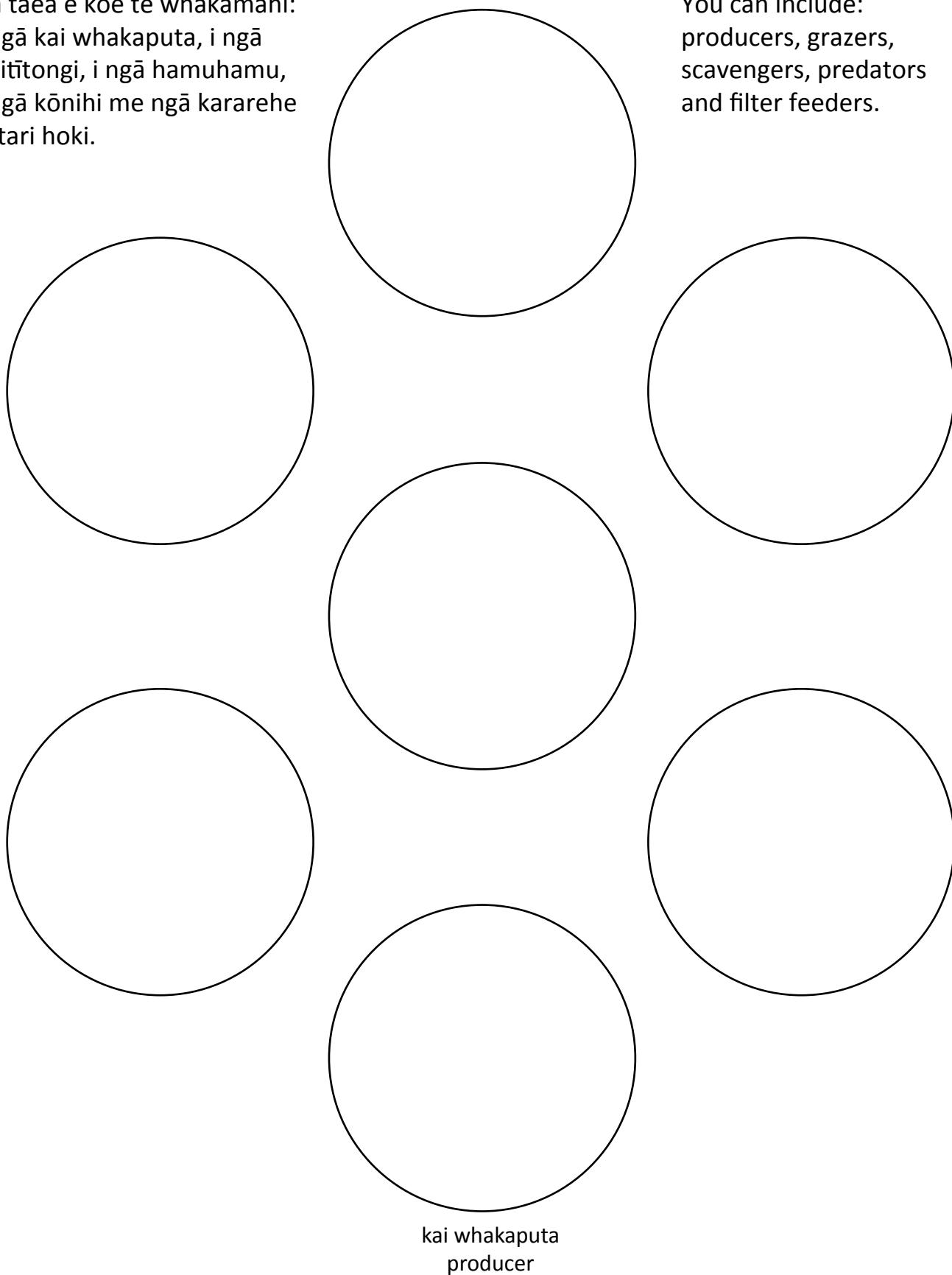


Hangaiā Tētehi Tukutuku Kai

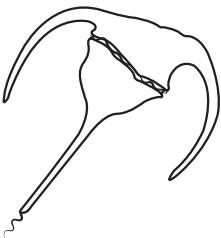
Make Your Own Food Web

Ka tāea e koe te whakamahi:
i ngā kai whakaputa, i ngā
kaitītongi, i ngā hamuhamu,
i ngā kōnihi me ngā kararehe
tātari hoki.

You can include:
producers, grazers,
scavengers, predators
and filter feeders.



Hē Rarangi Ingoa



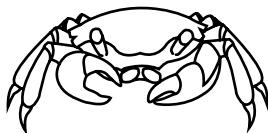
He raupi pūtautahi **ngā meroiti**, ka whakamahi rātou i ngā hīhī o te rā ki te hanga i a rātou kai. He haerere noa te mahi a ngā meroiti nei, ā, ka noho rātou hei kai mā ngā kararehe tātari.



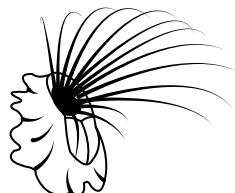
Ko **ngā rimurimu** ngā tipu o te moana, ka whakamahia e rātou ngā hīhī o te rā hei hanga i ā rātou kai pērā i tērā o te meroiti. He iti ētehi, ā, ko ētehi ka tipu neke atu i te 50 mita te roa hei hanga i ngā ngahere moana. Ka kainga ngā rimurimu e ngā kararehe maha o te moana.



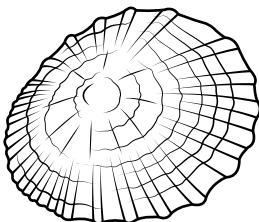
He kai tātari **ngā pāpaka kawekawe**. Ka whakamahia e rātou ngā kupenga hei hopu i ngā meroiti. Kīhai rātou e whakamahi ana i a rātou matihao hei kohi kai, engari kē ka whakamahia e rātou hei ārai i a rātou anō.



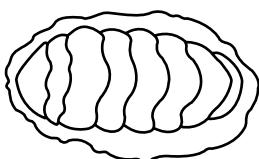
He hamuhamu **ngā pāpaka o te ākau**. Ka whakamahia e rātou o rātou matihao hei wetewete haere i ngā tipu me ngā kararehe kua mate hei kai mā rātou.



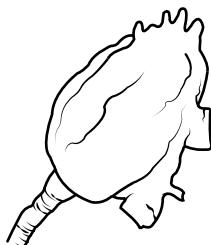
He whanaunga **te totito** nō te pāpaka me te kōura, engari he mea mau rātou ki ngā wāhi māro pērā ki tērā o te kōhatu. Tē tāea e rātou te whaiwhai haere i ā rātou kai. Ka whakamahia e rātou o rātou waewae ki te hopu i ngā meroiti hei kai.



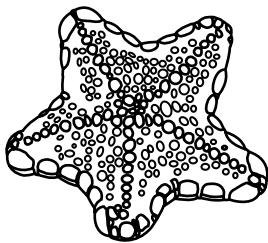
Ko te anga o **te ngākihi** anō nei he kōko te hanga, he waewae kaha ō rātou hei pupuri ki ngā kōhatu. He kaitītongi ngā ngākihi. He arero roa tō te kākihi hei kohi rimurimu, nā, ka nekeneke haere i a rātou e rapu kai ana kātahi ka hoki anō ki te wā kāinga.



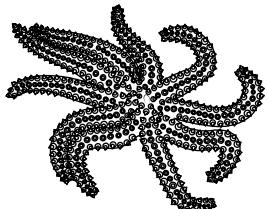
E waru ngā wāhanga rerekē o te anga o **te papatua**, he waewae kaha hoki ōna hei pupuri kōhatu. Ka kai hoki ngā papatua i ngā rimurimu, he niho kaha ō rātou kia kore ai e pakaru i a rātou e kohi kai ana. Me āta titiro atu ki ā rātou tapuwae.



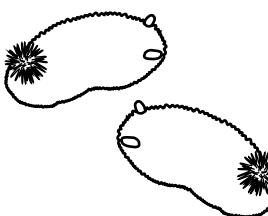
He ūrite te hanga o **te kāeo** ki tētehi tipu, engari he kararehe kē. Ahakoa tē tāea te tūripi moana te nuku, ka toro rātou i ō rātou pakiaka ki ngā wai e rere ai ngā meroiti.



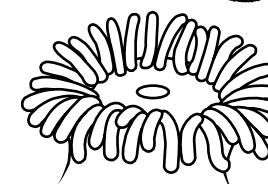
He maha ngā āhuatanga rerekē o **te papatangaroa**. He kai hamuhamu te whetū pihikete, ka kitea āna kai i te papa o te moana. Ka pana ngā whetū moana i ō rātou puku ki waho atu i te tinana ki te kai.



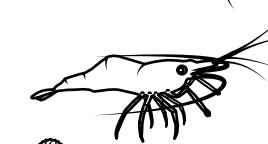
Ka whakamahia e **ngā papatangaroa kōnihi** ō rātou waewae hei wetewete haere i ngā kūtai me ērā atu o ngā mātaita hoki. Tekau mā tahi ngā ringa o tēnei momo whetū moana.



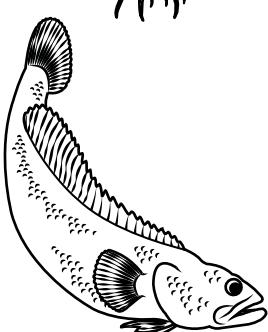
He kaikōnihi **te piha-kau**, ka kai rātou i ngā kōpūpūtai. I ētehi wā ka huri te tae o te piha-kau ki tērā o te kōpūpūtai i kainga e ia.



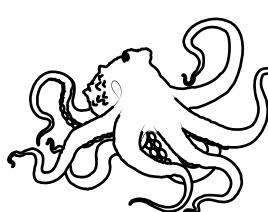
He kaikōnihi hoki **te kōtore moana**. Ka hopu rātou i ā rātou kai mā te wero i te kai me ō rātou wetewete. Ka kai rātou i ngā mea katoa ahakoa te aha.



He kaihamuhamu **te kōura**, he uua ka kite i te kōura karaehe nōna i noho pūataata ai.



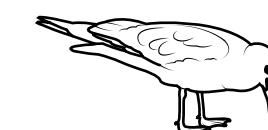
Ka kai **ngā ika tuamaka** i ngā potipoti e noho ana i ngā puna o te ākau. Ka huna rātou ki raro i ngā kōhatu i te wā ka timu te tai kia kore rātou e kainga e ngā ika nui.



He kaikōnihi **te wheke**, anō nei he ihu o te kākā tōna waha. Ka whakamahia ūna ngutu hei puaki i te anga o te potipoti. Nā te kaha o te panoni haere o te tae o te wheke, me uua ka kite i a ia.

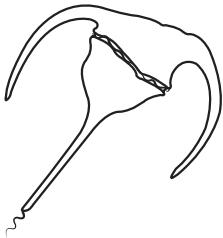


Ka kai **ngā mango** i ngā pārurenga katoa o te moana, ahakoa e ora ana, ahakoa kua mate rānei.



Pērā i te mango, ka kai hoki **ngā tarāpunga** i ngā mea katoa. Ka whakataka rātou i ngā kūtai, i ngā pūpū hoki mai i te rangi hei pakaru i te anga kia māmā ake tā rātou kai i te mīti o roto.

Creature Key



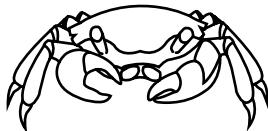
Phytoplankton are single-celled organisms that use the sun's energy to make their own food by the process of photosynthesis. They are free-floating and are eaten by zooplankton and filter feeders.



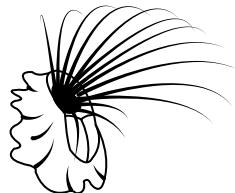
Seaweeds are the plants of the sea. They use photosynthesis to make their own food. Some are tiny and encrust rocks. Others grow to lengths of 50 metres and form underwater forests. Many animals feed on seaweeds.



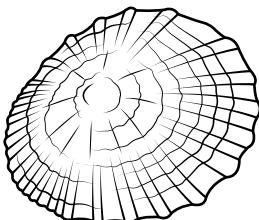
Crabs such as the half crab, are filter feeders. They use nets to filter plankton from the surrounding water. Their large claws are used for defence, not feeding.



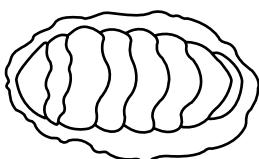
Shore crabs are scavengers. They use their claws to tear dead plants and animals into small bite-sized pieces.



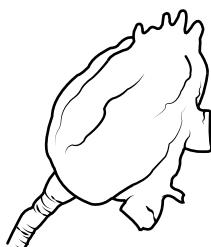
Barnacles are related to crabs and lobsters but are glued to the rock surface, so chasing their food is not an option. They use their feathery legs to filter plankton from the water around them.



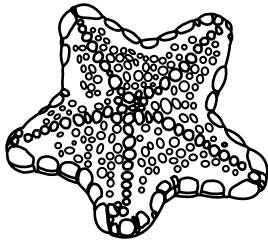
Limpets have a cone shaped shell and a muscular foot for holding onto rocks. They are grazers. They have a long zipper-like tongue called a radula that they use to scrape seaweed off rocks. They move around to graze, but return to a favourite spot to rest.



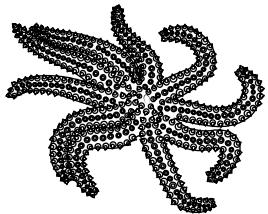
Chitons have eight separate shell plates and a muscular foot to hold onto rocks. Chitons graze on seaweed using their rasping radula. The teeth on their radula are made of iron so they don't wear away when scraping seaweed off rocks. Look carefully for their feeding trails.



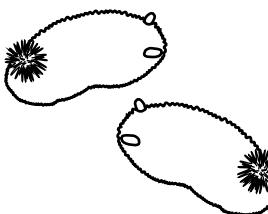
The sea tulip looks like a plant, but it is an animal - a filter-feeding sea squirt. Although sea tulips cannot move, their long stalks allow them to reach plankton-rich water.



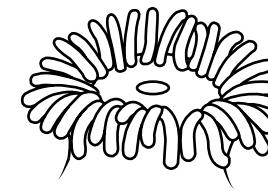
Sea stars come in many shapes and sizes and usually have five arms. The biscuit sea star is a scavenger, scouring the ocean floor for food. Sea stars push their stomachs outside their bodies to absorb their food.



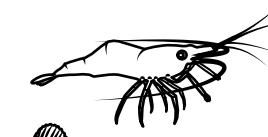
Predatory sea stars, like the spiny sea star, use their tube feet to slowly pull apart mussels and other shellfish. They squeeze their stomachs between the two shells and begin to digest the mussel inside. These sea stars may have up to eleven arms.



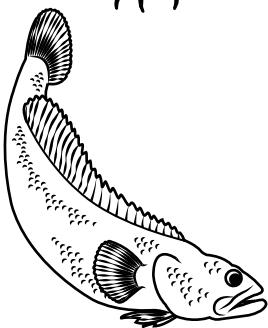
Nudibranchs are predators. They feed on sponges which encrust rocks. Some nudibranchs take on the colour of the sponges they eat. They breathe through feathery gills on the outside of their bodies.



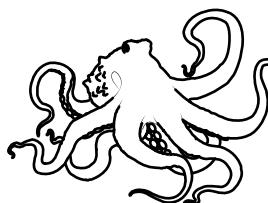
Anemones are predators. They trap passing prey with their stinging tentacles, pulling it into their stomach to digest. They will also scavenge any food that comes their way.



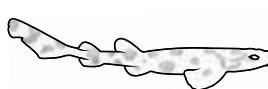
Shrimps scavenge for their food. The glass shrimp is difficult to spot in tide pools because it has a mostly transparent body.



Rock pool fish, such as the olive rock fish, hunt for small crustaceans in tidepools and along the shore. They hide under rocks at low tide so they don't get carried into deeper water where bigger fish might eat them.



Octopus are predators. The mouth of an octopus looks like the beak of a parrot. It uses its beak to crack the hard shells of crustaceans. The ability of octopus to change colour allows them to surprise their prey and hide from other predators.



Sharks will take live prey or scavenge for dead animals. The carpet shark has tiny teeth and eats small crustaceans and molluscs. The largest fish in the ocean is a whale shark which is a filter feeder.



Gulls eat many kinds of live and dead creatures they find on the shore. When they find a mussel or snail, they carry it into the sky and drop it onto the rocks from a height to break the shell open.

