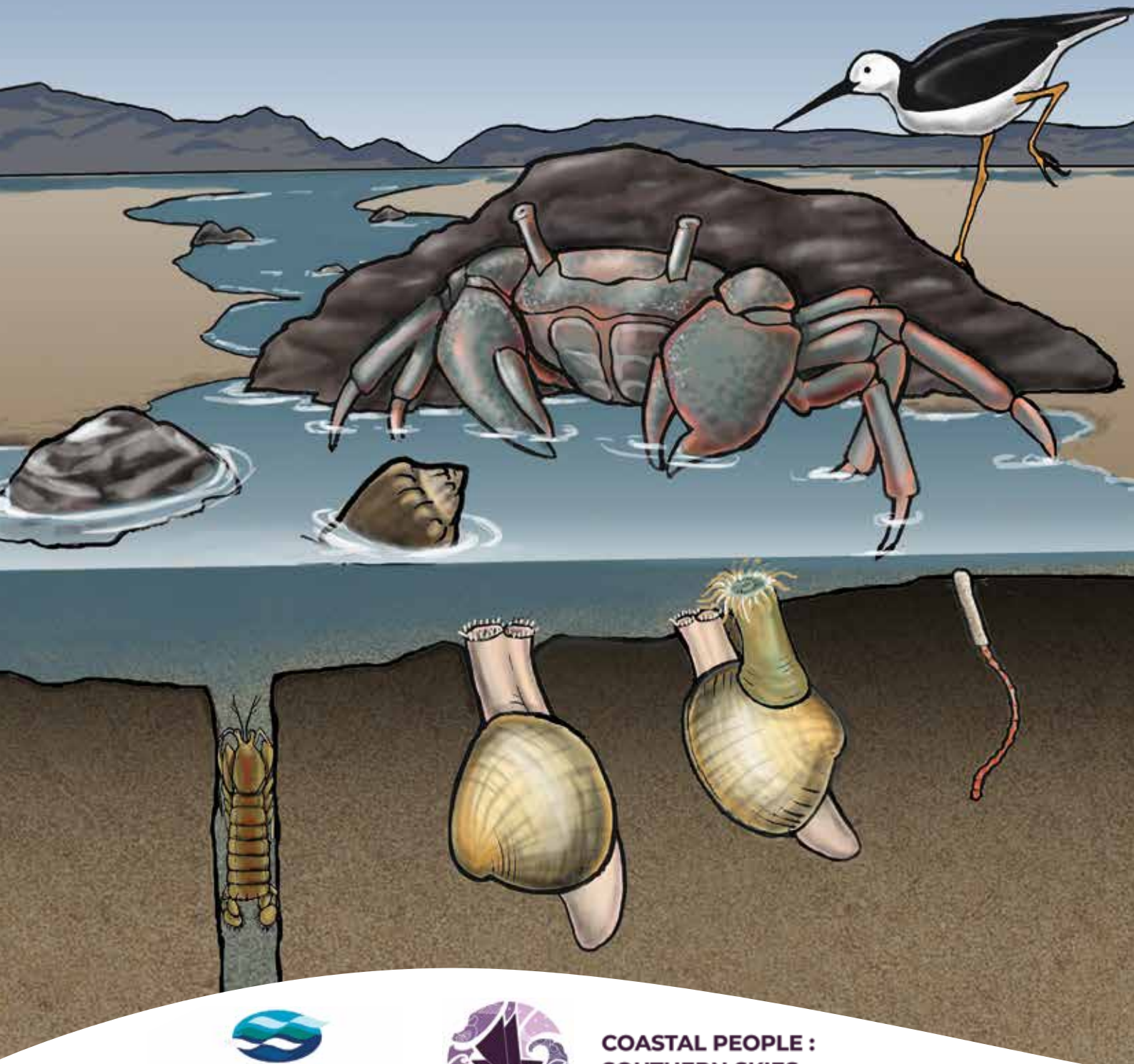
Ngā Kōraha Māminga
Mudflat Mysteries

He puka mahi
An educational workbook



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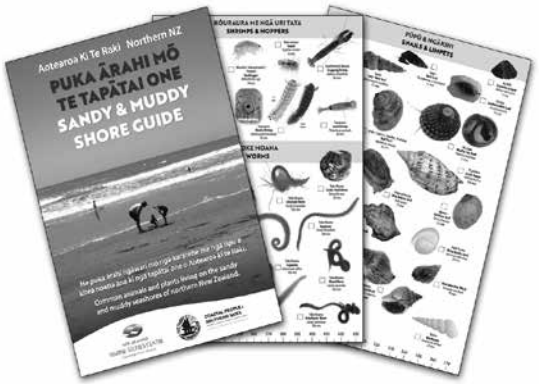

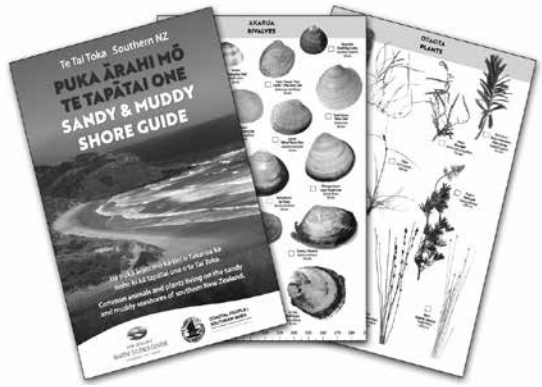

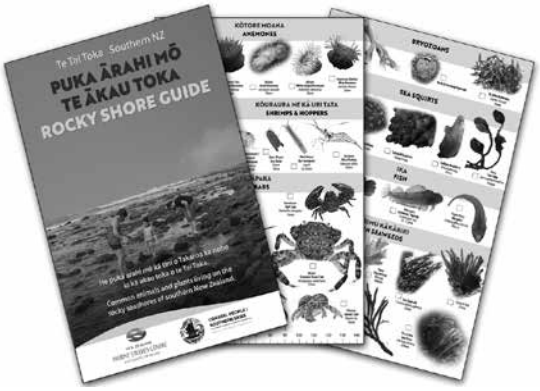

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Ngā Kōraha Māminga

He kōrero mā ngā kaiako me ngā mātua. He puka mahi tēnei e whakaatu ana i ngā kararehe me ngā tipu e noho ana i ngā takutai kōraha o Aotearoa. Mā ngā pikitia e āta whakaahua i ngā wāhi noho o ēnei kararehe, ā, mā ngā tohu e mōhio ai tātou he aha ngā tūmomo kararehe e noho ana i te karetai o te kōraha. Ka kite i ngā tūmomo whakatiki kai, ngā rautaki kai me ngā āhuatanga kohi kai o ia kararehe, me ā rātou rautaki hei karo i ngā kōnihi. He mea akiaki i ngā tamariki ki te whakaahua i ō rātou whakaaro mo ngā pikitia, ā, me whakautu hoki i ngā pātai kei ia whārangi. He kohinga kōrero anō kei te wharangi whakamutunga o te puka mahi nei mō ngā kararehe rerekē. Mā te mahi i tō tatauranga ake mo te takutai moana e kite ai koe i ngā kararehe e noho ana i ngā takutai o tō hau kainga (hono atu ki te whārangi ipurangi o www.mm2.net.nz mō ngā tohutohu). Ko ētehi whakaaro hei kōrerorero mā tātou ko ngā āhuatanga ka panoni i te taiao o ēnei kararehe me te pānga o tēnei ki a rātou. Ka taea e ngā tamariki te waihanga i tētehi pānui e whakaahua ana i ō rātou whakaaro mo tō tātou 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.

Mudflat Mysteries

Information for Teachers and Parents. This educational activity book features the animals and plants found between the tides on New Zealand's muddy shores. The illustrations show where the creatures live and what signs can be seen on the shore to indicate what lives below the surface. They give indications of the diet, feeding strategies and adaptations to find and capture food and avoid predators. Children should be encouraged to interpret what is shown in the scenes and to answer the questions posed on each page. Further information about a selection of the creatures can be found at the back of this book. Carrying out your own shore survey will show what creatures are living on your own local shore (see www.mm2.net.nz for instructions). Further discussion topics include factors that could alter the environment these creatures live in, and affect their ability to find or catch food. Children could then make a poster to illustrate their ideas of what they could do to look after our 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 te puka nei e ngā kaimahi
o te Whare Mātai Moana o Aotearoa,
ā nā Melissa Snider rauā ko Tessa Mills ngā whakaahua.
Nā Rangiiria Barclay-Kerr i whakamāori.

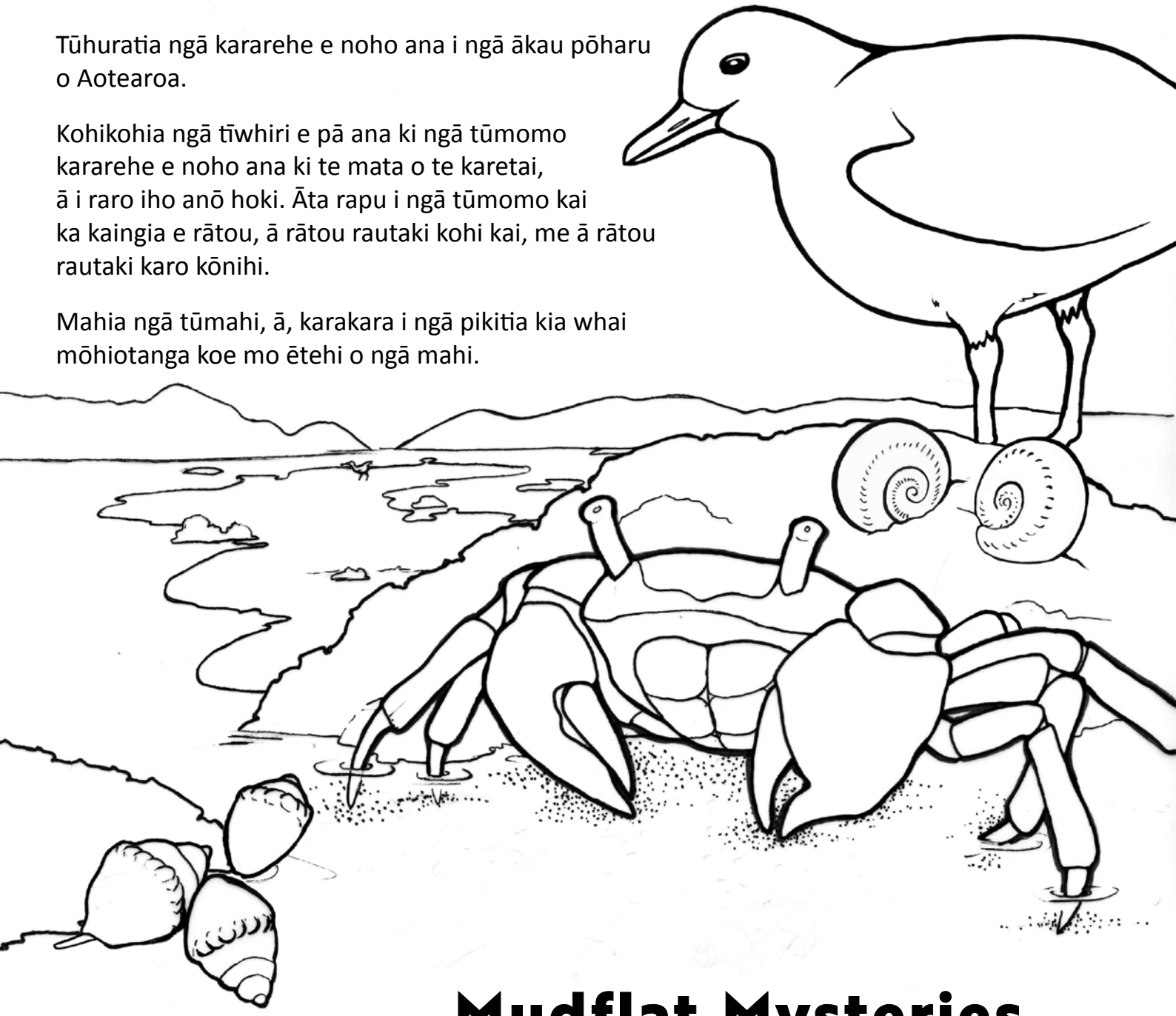
This educational activity book was designed by staff
at the New Zealand Marine Studies Centre.
It was illustrated by Melissa Snider and Tessa Mills
and translated into te reo Māori by Rangiiria Barclay-Kerr.

Ngā Kōraha Māminga

Tūhuratia ngā kararehe e noho ana i ngā ākau pōharu o Aotearoa.

Kohikohia ngā tīwhiri e pā ana ki ngā tūmomo kararehe e noho ana ki te mata o te karetai, ā i raro iho anō hoki. Āta rapu i ngā tūmomo kai ka kaingia e rātou, ā rātou rautaki kohi kai, me ā rātou rautaki karo kōnihi.

Mahia ngā tūmahi, ā, karakara i ngā pikitia kia whai mōhiotanga koe mo ētehi o ngā mahi.



Mudflat Mysteries

Discover the creatures that live between the tides on the muddy shores of New Zealand.

Gather clues about what lives on and beneath the surface. Find out what these creatures eat, how they catch their food and avoid predators.

To learn more, try the activities and colour in the pictures.

Kia ora! Ko Ruby ahau, he Tārāpunga ahau. Awhinatia au te hīraurau i ngā kōraha māminga.

Hi! I'm Ruby, the Red-Billed Gull. Help me solve the mysteries of the mudflat.

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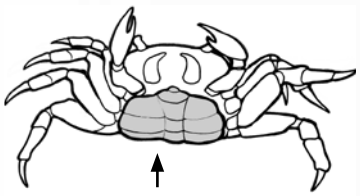
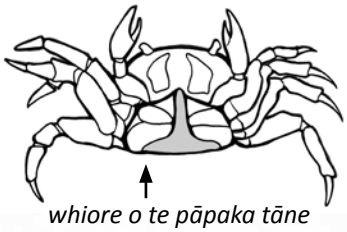
Whānonga Pāpaka
Crabby Behaviour



whiore o te pāpaka wahine
female crab tail



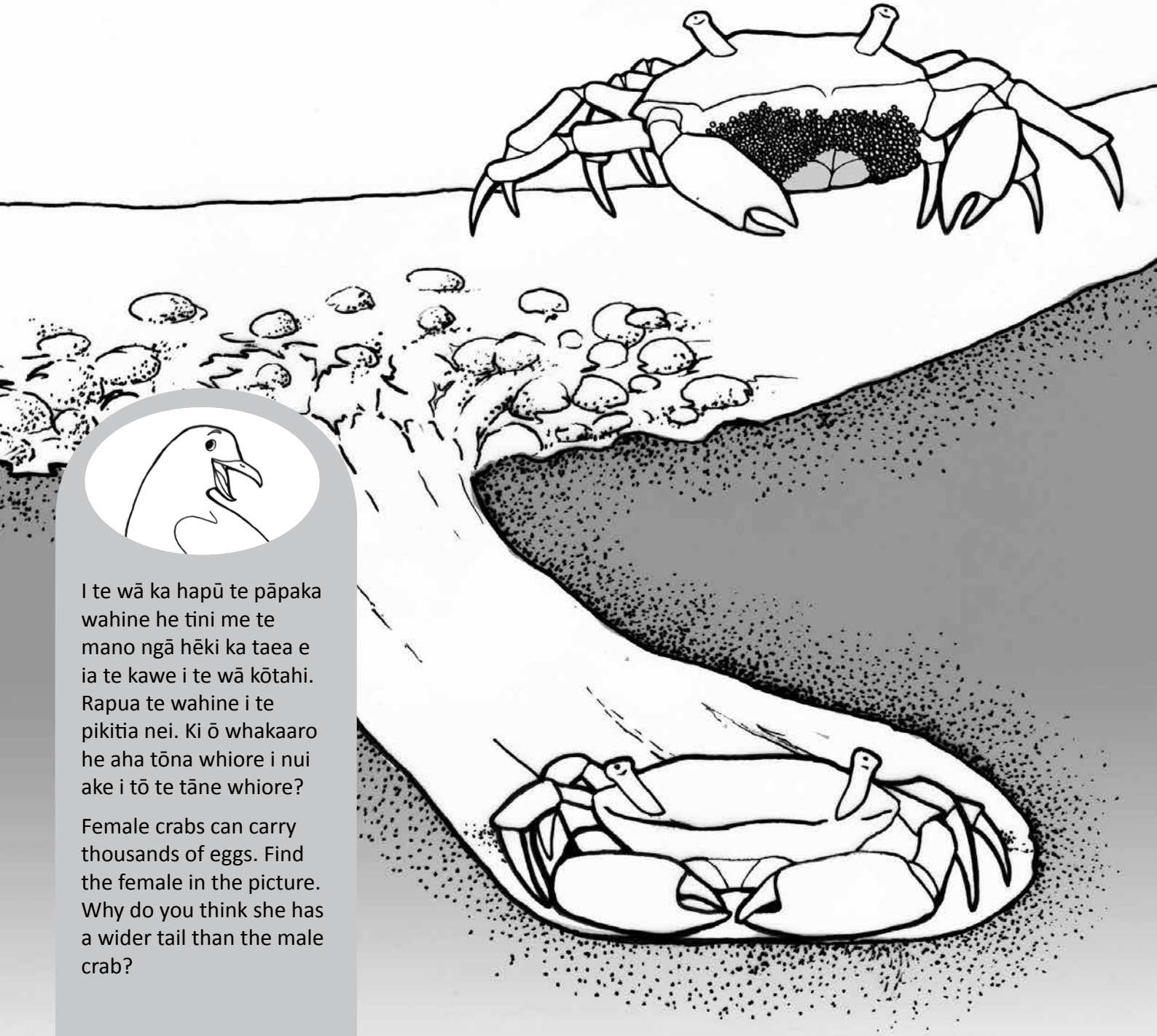
whiore o te pāpaka tāne
male crab tail

Rapua ngā rua pāpaka i te papa kōraharaha. E hautoki ana te onepū me te paru kua keria e ngā pāpaka i ngā tomokanga ki ō rātou rua.

Mā ngā rua ngā pāpaka e ārai, e tiaki mai i ngā kōnihi, ā, he wāhi mākū mā rātou i te wā ka timu te tai.

Look for crab burrows on the mudflat. The entrances are surrounded by pellets of sand and mud that the crabs have dug out to make their homes.

Crabs use these burrows to hide from predators and to stay damp and cool when the tide goes out.



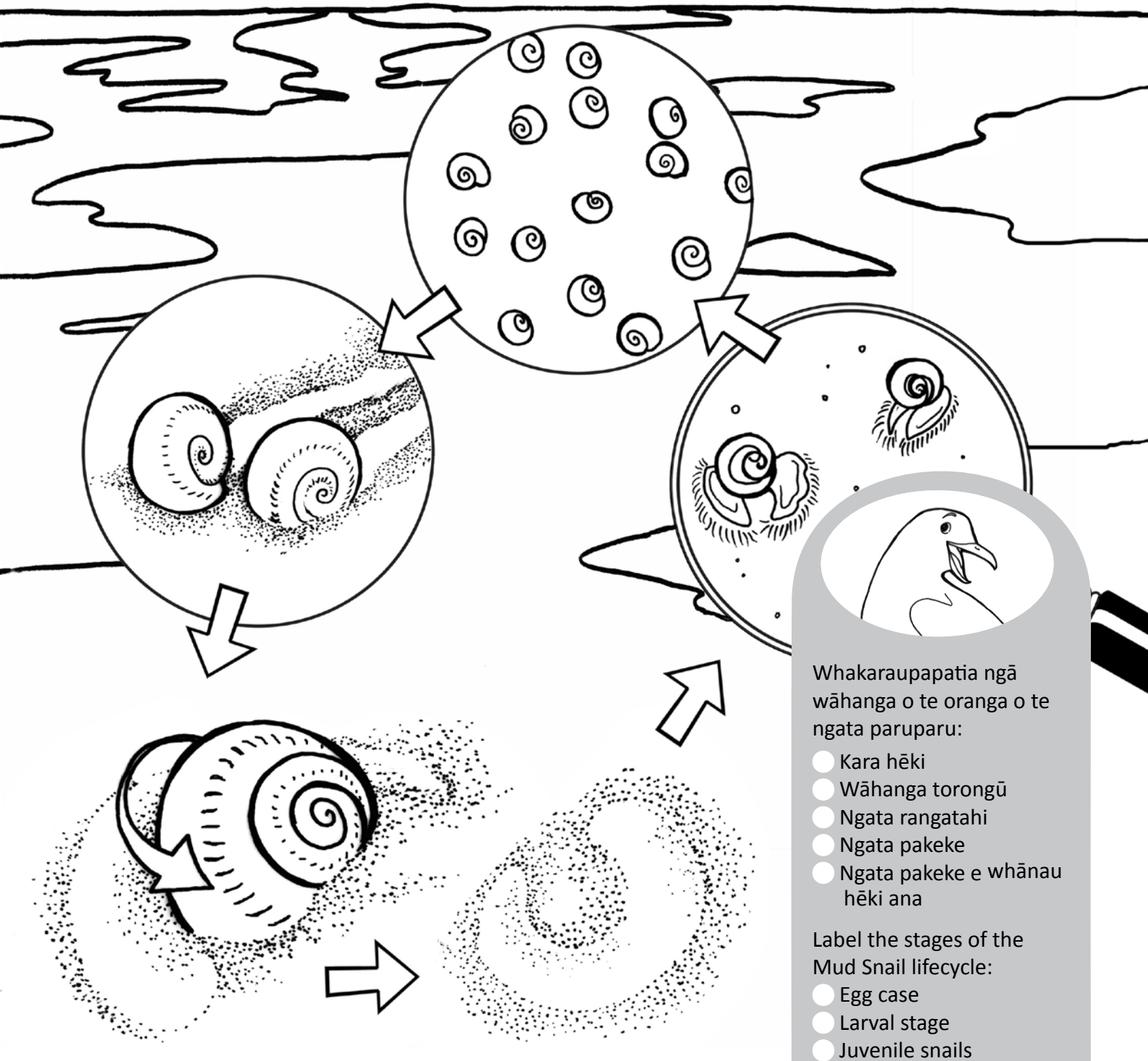
I te wā ka hapū te pāpaka wahine he tini me te mano ngā hēki ka taea e ia te kawe i te wā kōtahi. Rapua te wahine i te pikitia nei. Ki ō whakaaro he aha tōna whiore i nui ake i tō te tāne whiore?

Female crabs can carry thousands of eggs. Find the female in the picture. Why do you think she has a wider tail than the male crab?

Ngā Kara Onepū o te Raumati
Summer Sand Collars

Rapua te angaanga o te ngata paruparu. I te ngata e whānau pēpi ana ka huri ia i roto i te onepū, ā, ka waihanga ia i tētehi tūmomo kara i roto i te onepū. I mua i te pakeketanga o ngā ngata, ka noho rātou hei tūmomo torongū e kauhoe haere ana i te wai.

Look for the egg case of the Mud Snail. The snail turns as she releases thousands of eggs, creating a collar-shaped case in the sand. These hatch into free-swimming larvae before growing into juvenile snails that live in the mud.



Whakaraupapatia ngā wāhanga o te oranga o te ngata paruparu:

- Kara hēki
- Wāhanga torongū
- Ngata rangatahi
- Ngata pakeke
- Ngata pakeke e whānau hēki ana

Label the stages of the Mud Snail lifecycle:

- Egg case
- Larval stage
- Juvenile snails
- Adult snails
- Adult laying eggs

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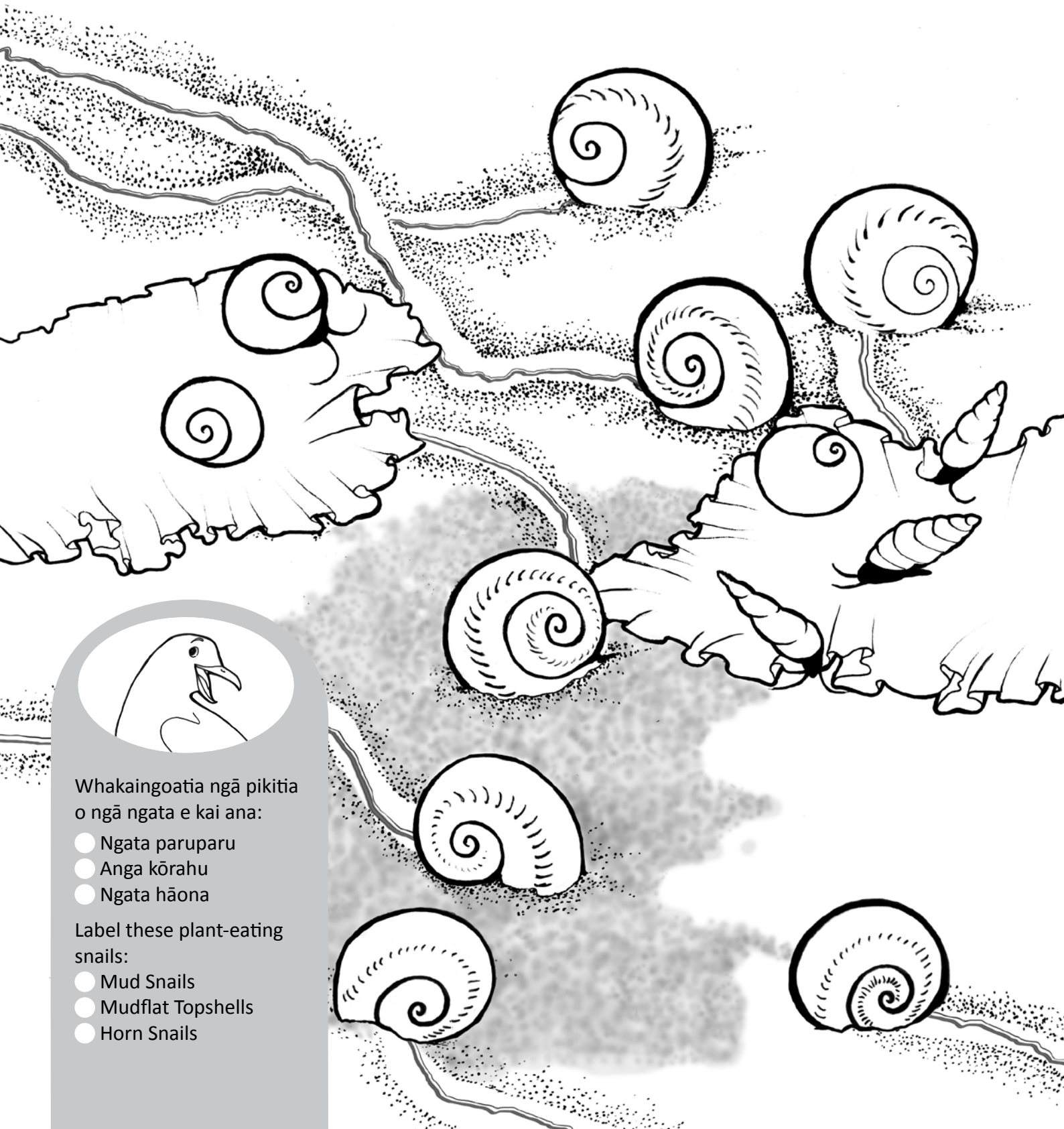
He Autō Tiko
Trails of Poo

Tirohia ngā taunakitanga o ngā wāhi kai a te ngata paruparu. Ka kai rātou i ngā tipu merowhetau i te karetai o te paru, ā, i a rātou e nekeneke haere ana ka waihōtia e rātou tētehi autō tiko.

Look for evidence of where Mud Snails have been feeding. They eat diatoms (microscopic plants) found in the surface mud and leave a poo trail of discarded sediment grains.



Whakaingoatia ngā pikitia o ngā ngata e kai ana:

- Ngata paruparu
- Anga kōrahu
- Ngata hāona

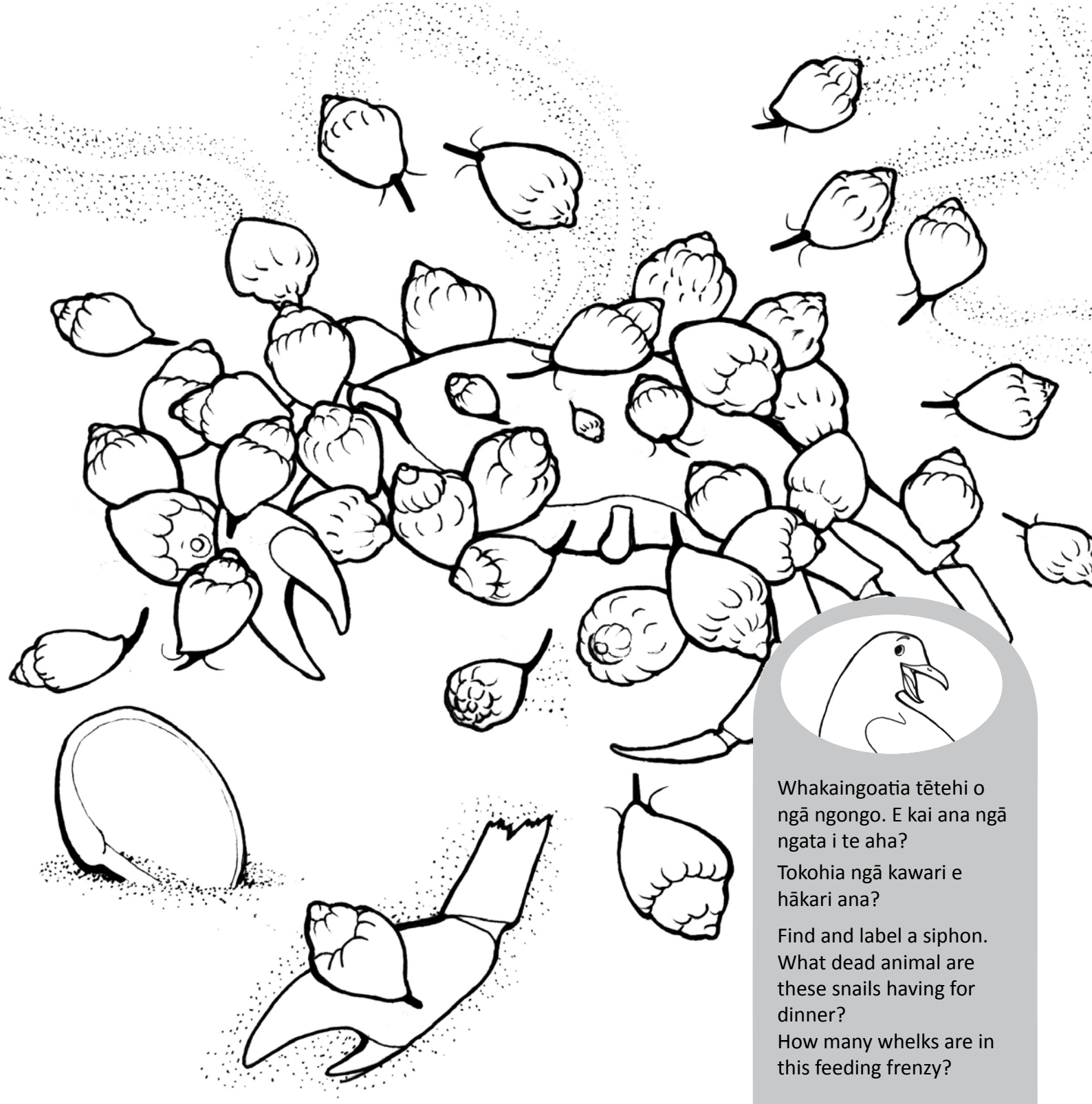
Label these plant-eating snails:

- Mud Snails
- Mudflat Topshells
- Horn Snails

He Kai Hākari
Feeding Frenzy

He kaihamu ngā kawari kōrahu, ka kaingia e rātou ngā pārurenga kua mate pēnā tonu i te pāpaka me te tūangi. Āta titiro mō ō rātou ngongo pango ka whakamahia e rātou ki te hongi haere i ngā tūmomo kai.

Mudflat Whelks are scavengers and will hunt out dead or dying prey like crabs or cockles. Look for the black siphon that they use to sniff out their dinner.



Whakaingoatia tētehi o ngā ngongo. E kai ana ngā ngata i te aha?

Tokohia ngā kawari e hākari ana?

Find and label a siphon. What dead animal are these snails having for dinner?

How many whelks are in this feeding frenzy?

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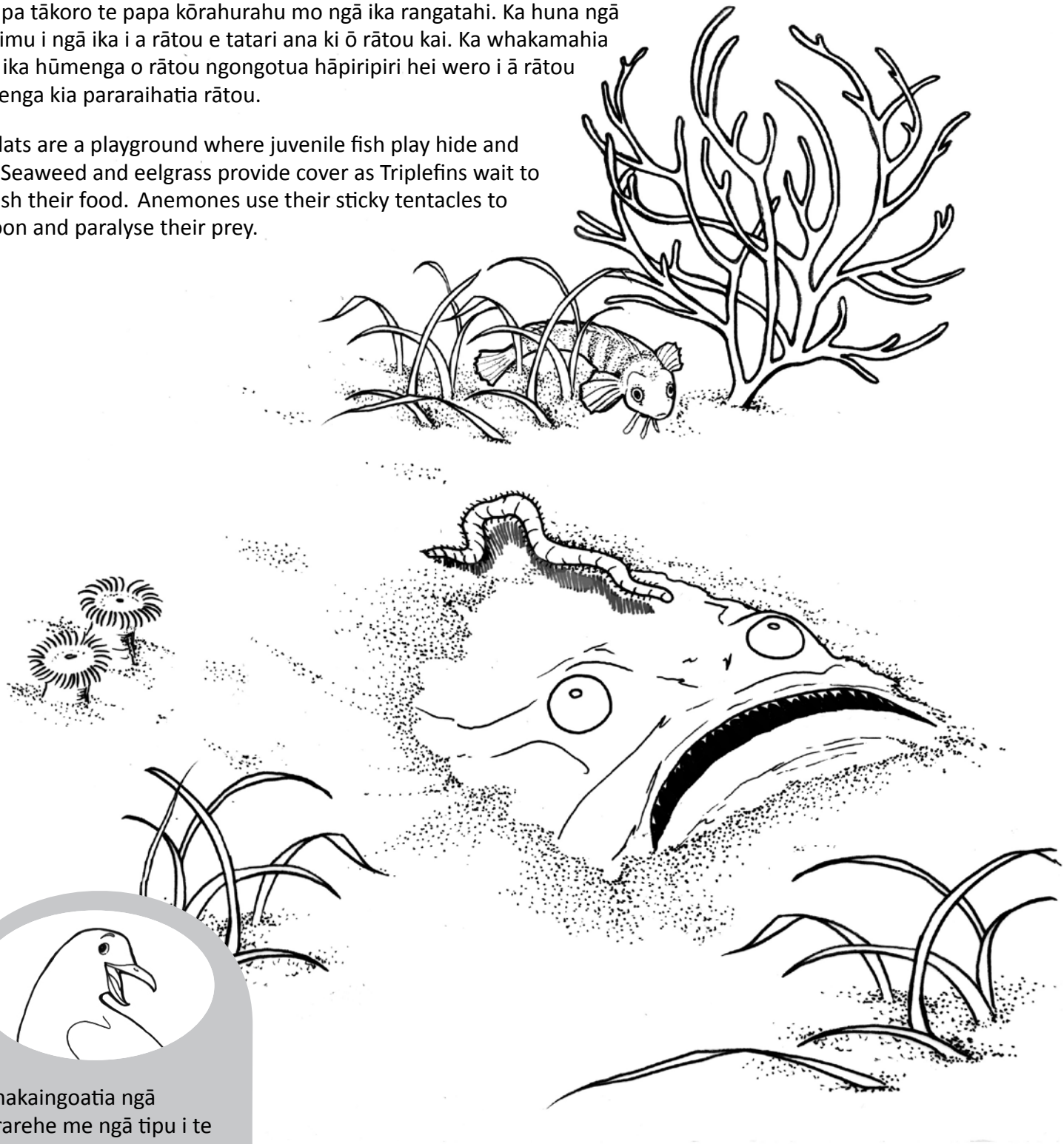
Ngā Kōnihi Manukāwhaki
Ambush Predators

He papa tākoro te papa kōrahurahu mo ngā ika rangatahi. Ka huna ngā rimurimu i ngā ika i a rātou e tatari ana ki ō rātou kai. Ka whakamahia e ngā ika hūmenga o rātou ngongotua hāpiripiri hei wero i ā rātou pārurenga kia pararaihatia rātou.

Mudflats are a playground where juvenile fish play hide and seek. Seaweed and eelgrass provide cover as Triplefins wait to ambush their food. Anemones use their sticky tentacles to harpoon and paralyse their prey.



Whakaingoatia ngā kararehe me ngā tipu i te pikitia nei. I pēhea i riro ai e te ika moamoa i tōna ingoa?

Label the animals and plants in the picture. How did the Stargazer get its name?

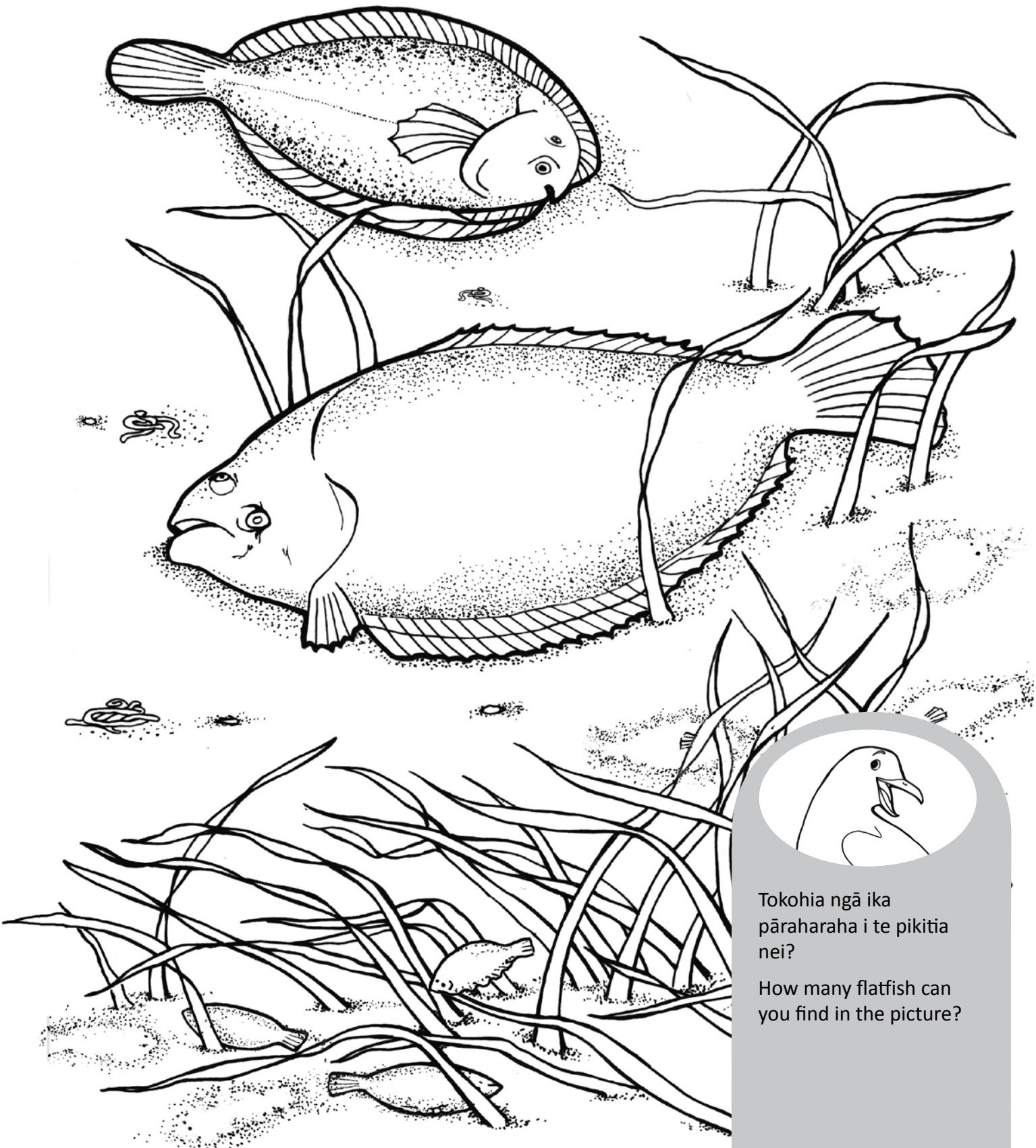
Ka huna ngā ika moamoa i raro iho i te paruparu. Ko tōna waha me ōna karu noa iho ka kitea i a ia e tatari ana ki te hopu i ngā noke o te moana.

Stargazers bury themselves in the mud to hide. Only their eyes and mouth are visible as they lie in wait to pounce on unsuspecting worms and small crustaceans.

Ngā Māpuna Koropuku
Hidden Gems

He tino pūkenga te rapu ika pāraharaha i te papa kōrehurehu. Ka panoni rātou i ō rātou tae kia rite tonu ki tērā o te taiao.

Finding flatfish on the mudflat is a real skill. They change their colour to match their environment and disturb the sand to disguise their body.



Tokohia ngā ika pāraharaha i te pikitia nei?

How many flatfish can you find in the picture?

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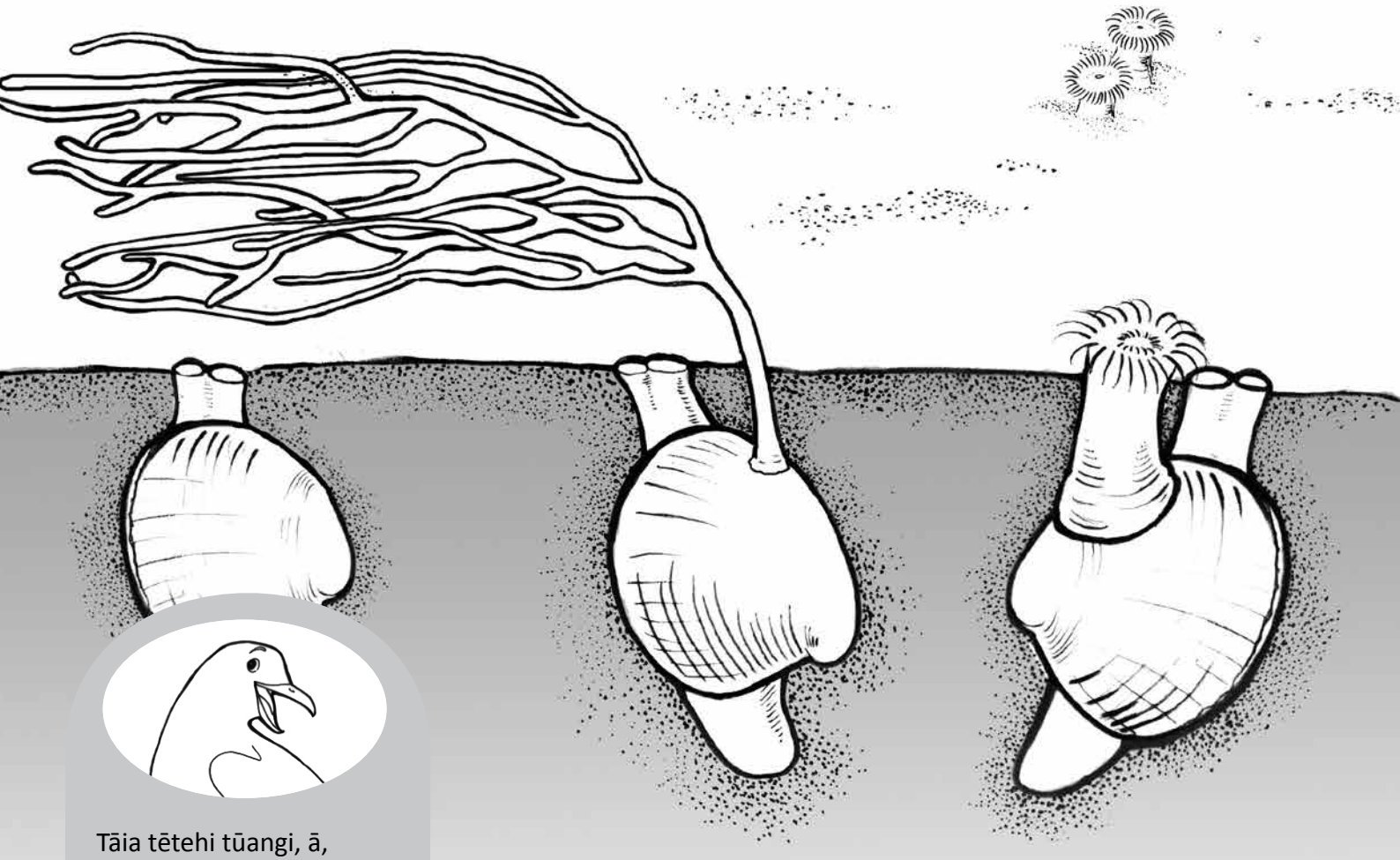
Kei Runga, Kei Raro
Above and Below

Mā ngā tūmomo oranga i te karetai o te paruparu e mōhio ai tātou he aha kē e huna ana ki raro iho. Ko ngā hūmenga kōrehurehu ka kitea i te karetai he tohu o te tūangi.

Life on the surface provides exciting clues as to what is lurking below. A Mudflat Anemone poking through the mud or a mound of seaweed often leads to a Cockle below.



Tāia tētehi tūangi, ā, whakaingoatia ōna wāhanga:

- Anga
- Waewae
- Ngongo
- Īnihi

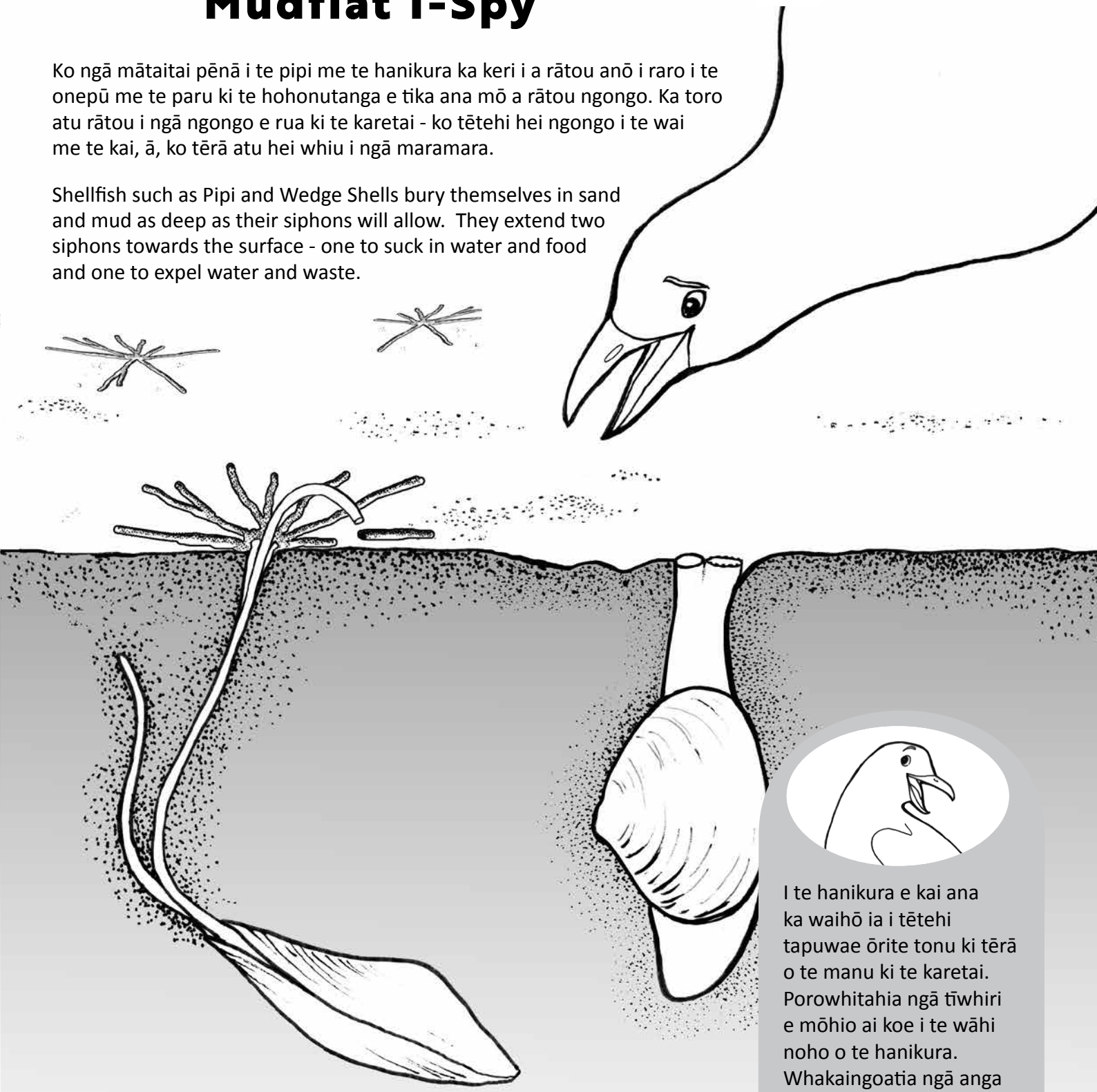
Draw a Cockle and label the parts:

- Shell
- Foot
- Siphons
- Hinge

Ka Kite ō Karu i te Aha
Mudflat I-Spy

Ko ngā mātaitai pēnā i te pipi me te hanikura ka keri i a rātou anō i raro i te onepū me te paru ki te hohonutanga e tika ana mō a rātou ngongo. Ka toro atu rātou i ngā ngongo e rua ki te karetai - ko tētehi hei ngongo i te wai me te kai, ā, ko tērā atu hei whiu i ngā maramara.

Shellfish such as Pipi and Wedge Shells bury themselves in sand and mud as deep as their siphons will allow. They extend two siphons towards the surface - one to suck in water and food and one to expel water and waste.



I te hanikura e kai ana ka waihō ia i tētehi tapuwae ōrite tonu ki tērā o te manu ki te karetai. Porowhitahia ngā tīwhiri e mōhio ai koe i te wāhi noho o te hanikura. Whakaingoatia ngā anga rerekē.

When a Wedge Shell is feeding it leaves a mark like a bird's footprint at the surface. Circle the clues that show you where Wedge Shells are. Label the different shells.

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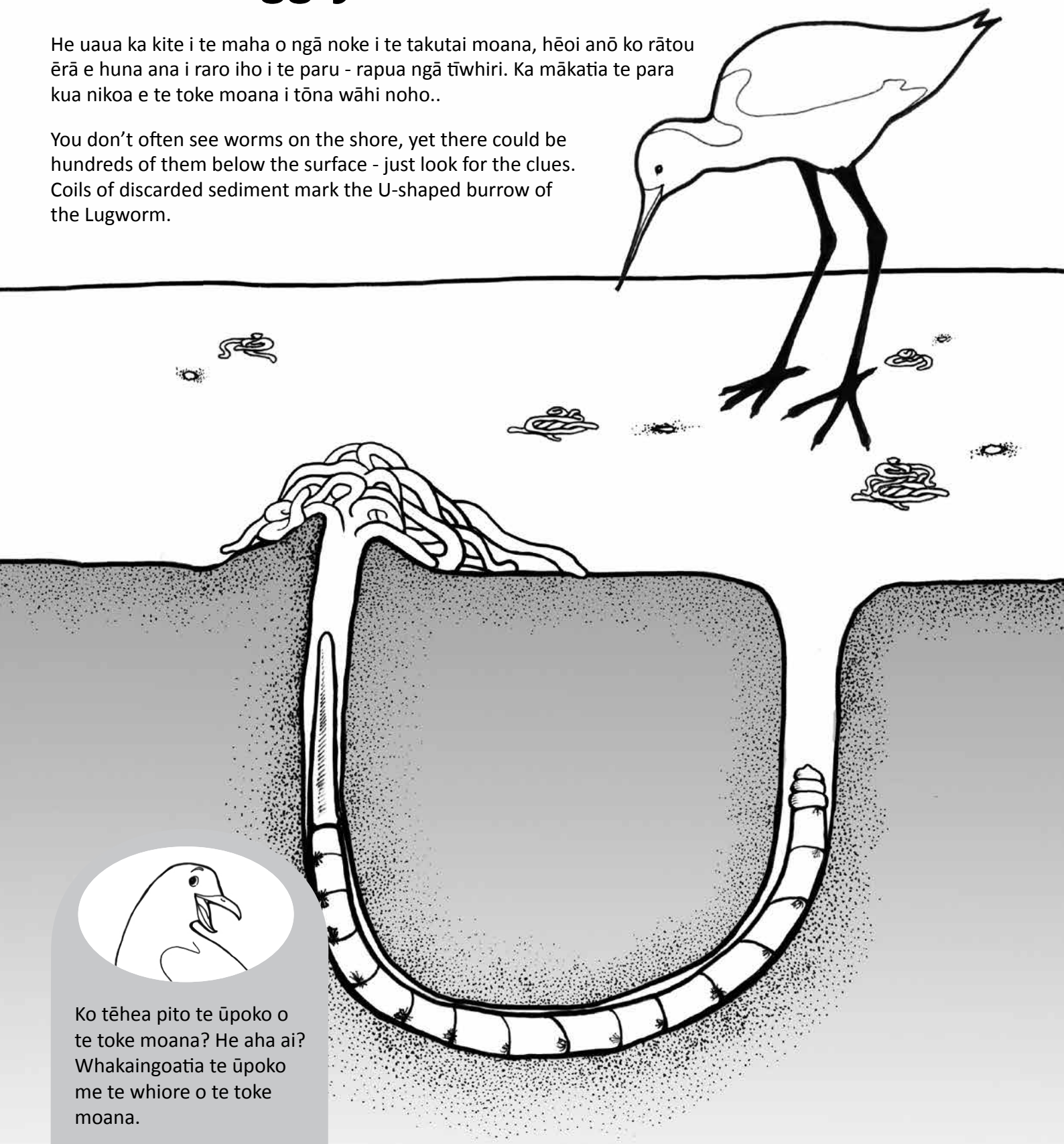
Noke Nekeneke
Wiggly Worms

He uaua ka kite i te maha o ngā noke i te takutai moana, hēoi anō ko rātou ērā e huna ana i raro iho i te paru - rapua ngā tīwhiri. Ka mākatia te para kua nikoa e te toke moana i tōna wāhi noho..

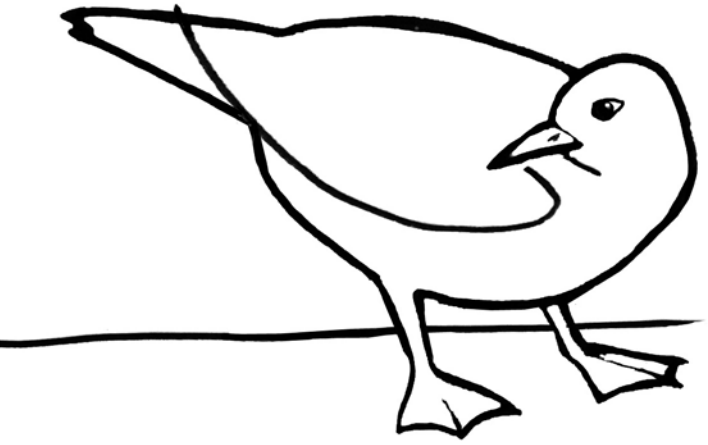
You don't often see worms on the shore, yet there could be hundreds of them below the surface - just look for the clues. Coils of discarded sediment mark the U-shaped burrow of the Lugworm.



Ko tēhea pito te ūpoko o te toke moana? He aha ai? Whakaingoatia te ūpoko me te whiore o te toke moana.

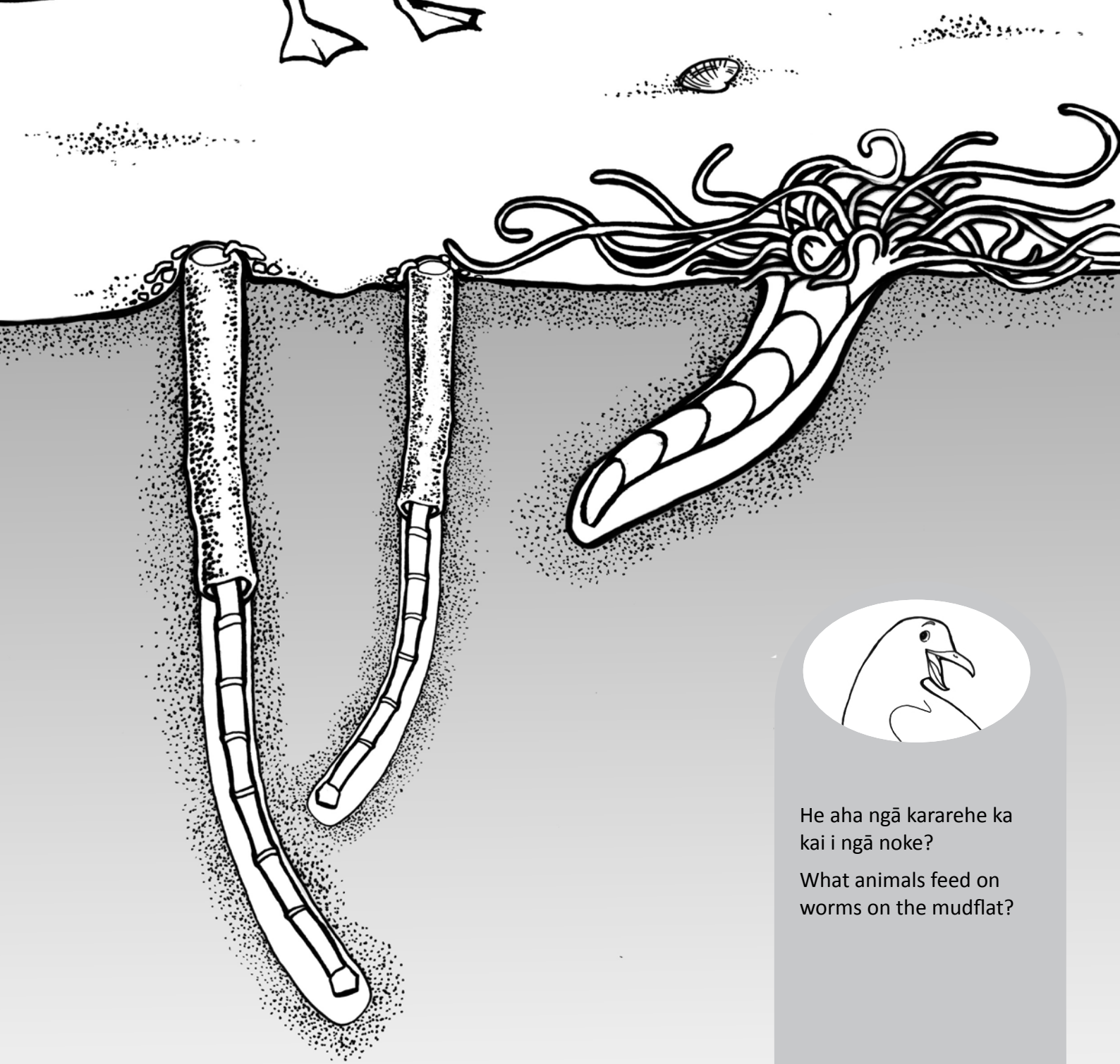
Which end do you think is the head. Why? Label the head and the tail of the Lugworm.

Ngā Kaineke Paruparu
Mud Movers



Ka kai ngā toke moana īnanga ki raro iho i te paru, ā, ka tiko i te karetai. Ka hāpai te tikoo te toke moana i te hauora o te paruparu. Ka whakamahi ngā noke rimurapa i ō rātou kawekawe ki te kohi i ngā kai rerekē mai i te papa.

Bamboo Worms eat at depth and poo at the surface which helps recycle the nutrients trapped in the lower layers. Spaghetti Worms use their many tentacles to pick up food particles from the surface.



He aha ngā kararehe ka kai i ngā noke?

What animals feed on worms on the mudflat?

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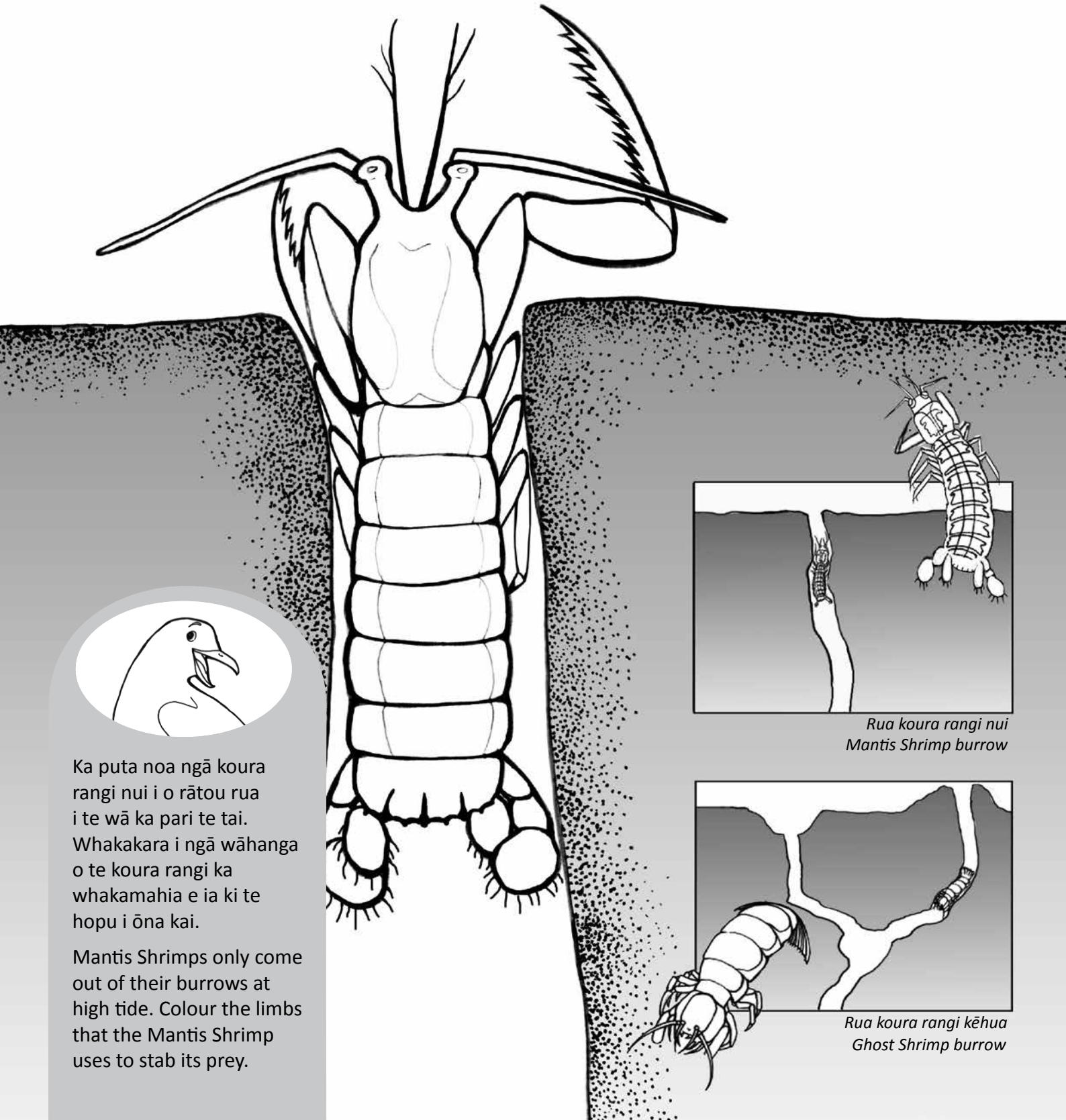
Ngā Puia Paruparu
Mud Volcanoes

Ka huna ngā koura rangi i roto i te paru i te wā ka timu te tai, ēngari ka kite tonu i ō rātou rua. He mā te rua o te koura rangi nui. Ko te rua anō nei he puia tōna hanga he tohu o te koura rangi kēhua.

Shrimps hide in the mud at low tide, but their burrows are easy to spot. A Mantis Shrimp burrow is marked by a clean hole. A volcano-shaped mound of mud and a crater close by is a sure sign of a Ghost Shrimp.



Ka puta noa ngā koura rangi nui i o rātou rua i te wā ka pari te tai. Whakakara i ngā wāhanga o te koura rangi ka whakamahia e ia ki te hopu i ōna kai.

Mantis Shrimps only come out of their burrows at high tide. Colour the limbs that the Mantis Shrimp uses to stab its prey.

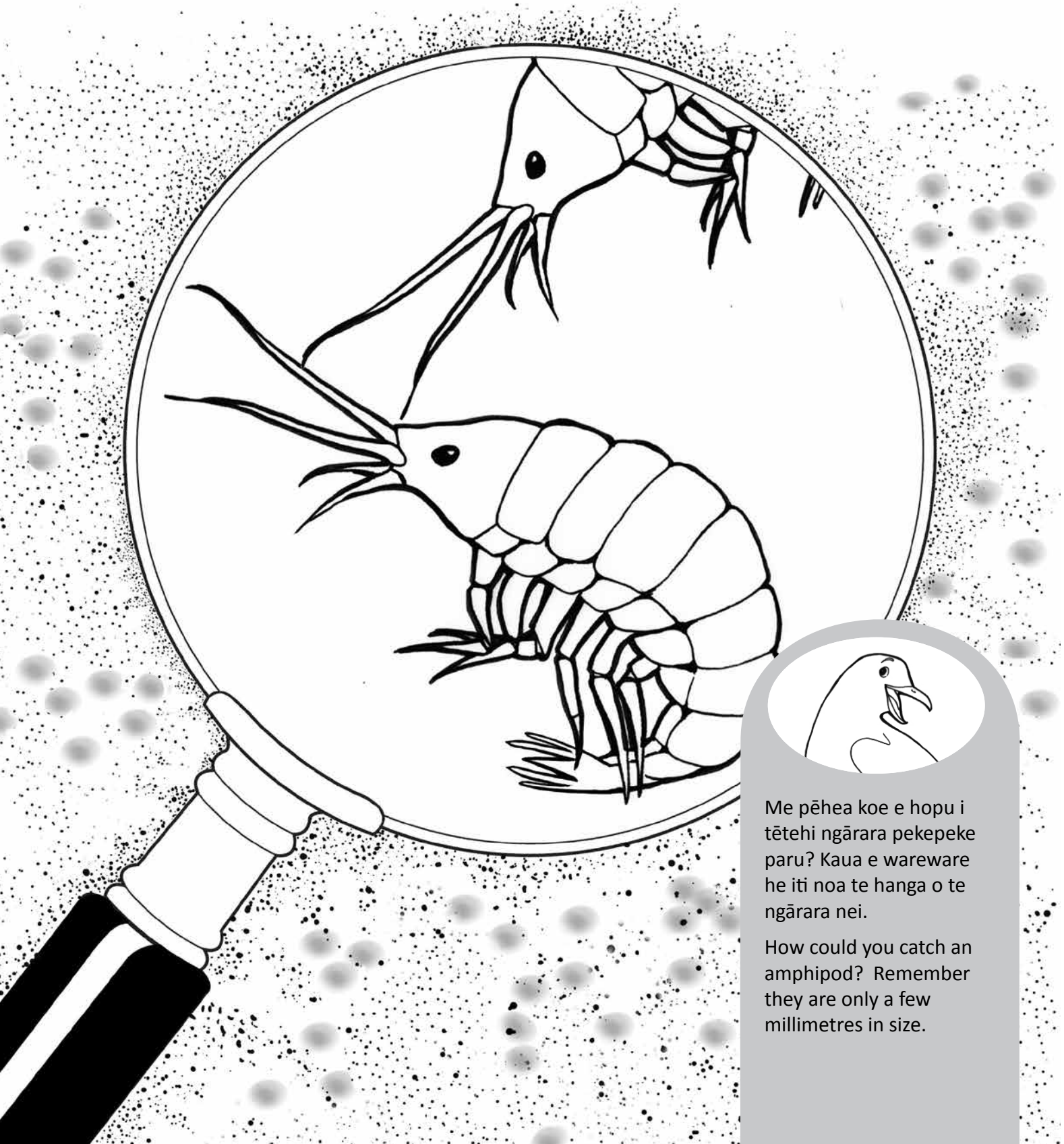
Rua koura rangi nui
Mantis Shrimp burrow

Rua koura rangi kēhua
Ghost Shrimp burrow

Ngā Ngārara Rua
Burrowing Bugs

Ko ngā puke paru ka kitea i te moana ngā rua o ngā ngārara pekepeke paru. He whānaunga no te ngārara peke onepū o te takutai onepū, he ōrite te tae o te kiri o te ngārara ki te paruparu e nohoia ana e ia.

Each little bump in the mud could be the temporary burrow of an amphipod. Closely related to the Sand Hoppers of the sandy shore, they are the same colour as the mud they live in.



Me pēhea koe e hopu i tētehi ngārara pekepeke paru? Kaua e wareware he iti noa te hanga o te ngārara nei.

How could you catch an amphipod? Remember they are only a few millimetres in size.

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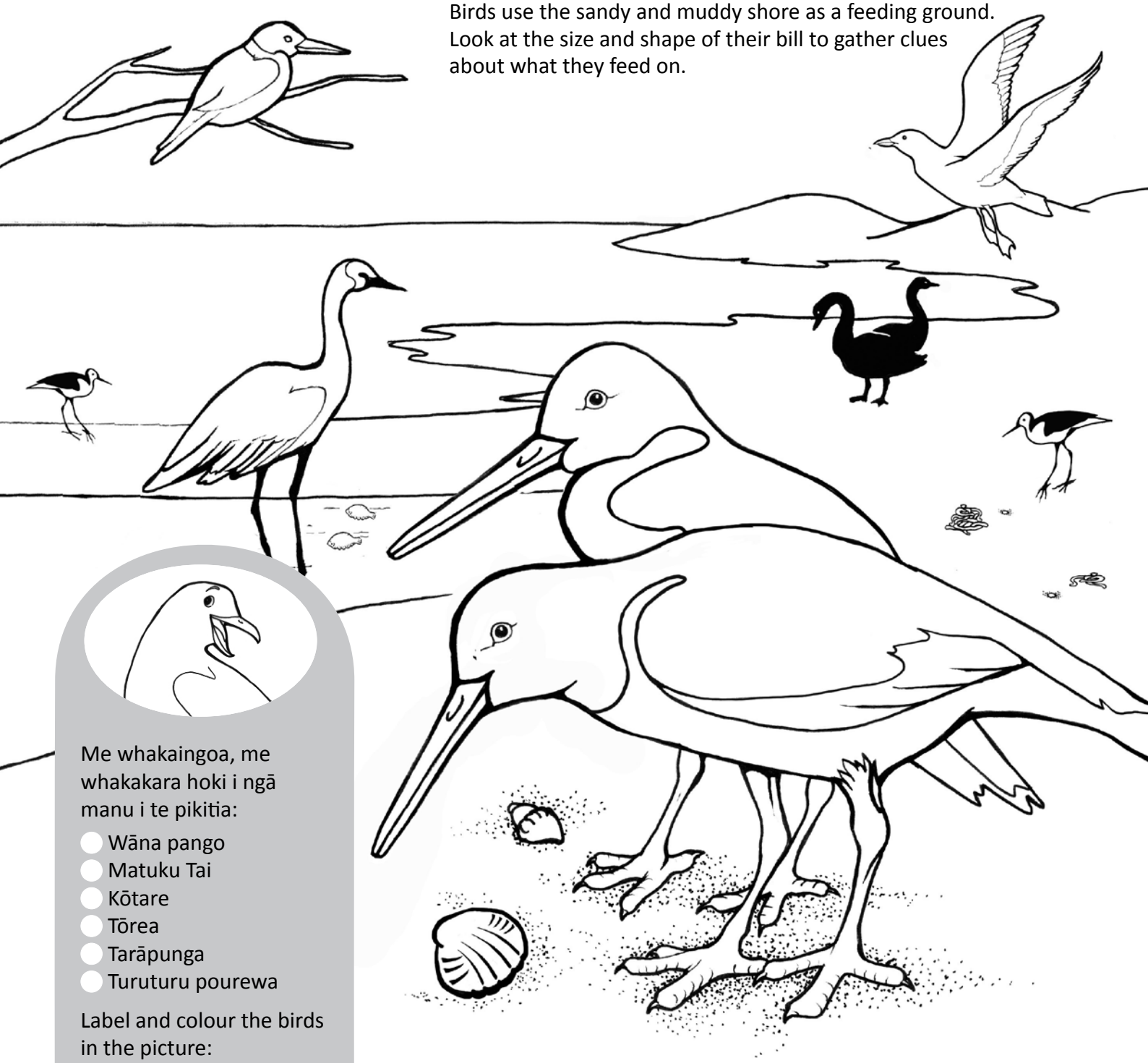
Ngā Manuhiri o te Ākau
Shore Visitors

Ka whakamahia e ngā manu ngā ākau onepū me ngā ākau paruparu hei papa kai. Tirohia te rahi o a rātou waha, ā, he aha hoki pea ētehi o ngā kai ka kainga e rātou.

Birds use the sandy and muddy shore as a feeding ground. Look at the size and shape of their bill to gather clues about what they feed on.



Me whakaingoa, me whakakara hoki i ngā manu i te pikitia:

- Wāna pango
- Matuku Tai
- Kōtare
- Tōrea
- Tarāpunga
- Turuturu pourewa

Label and colour the birds in the picture:

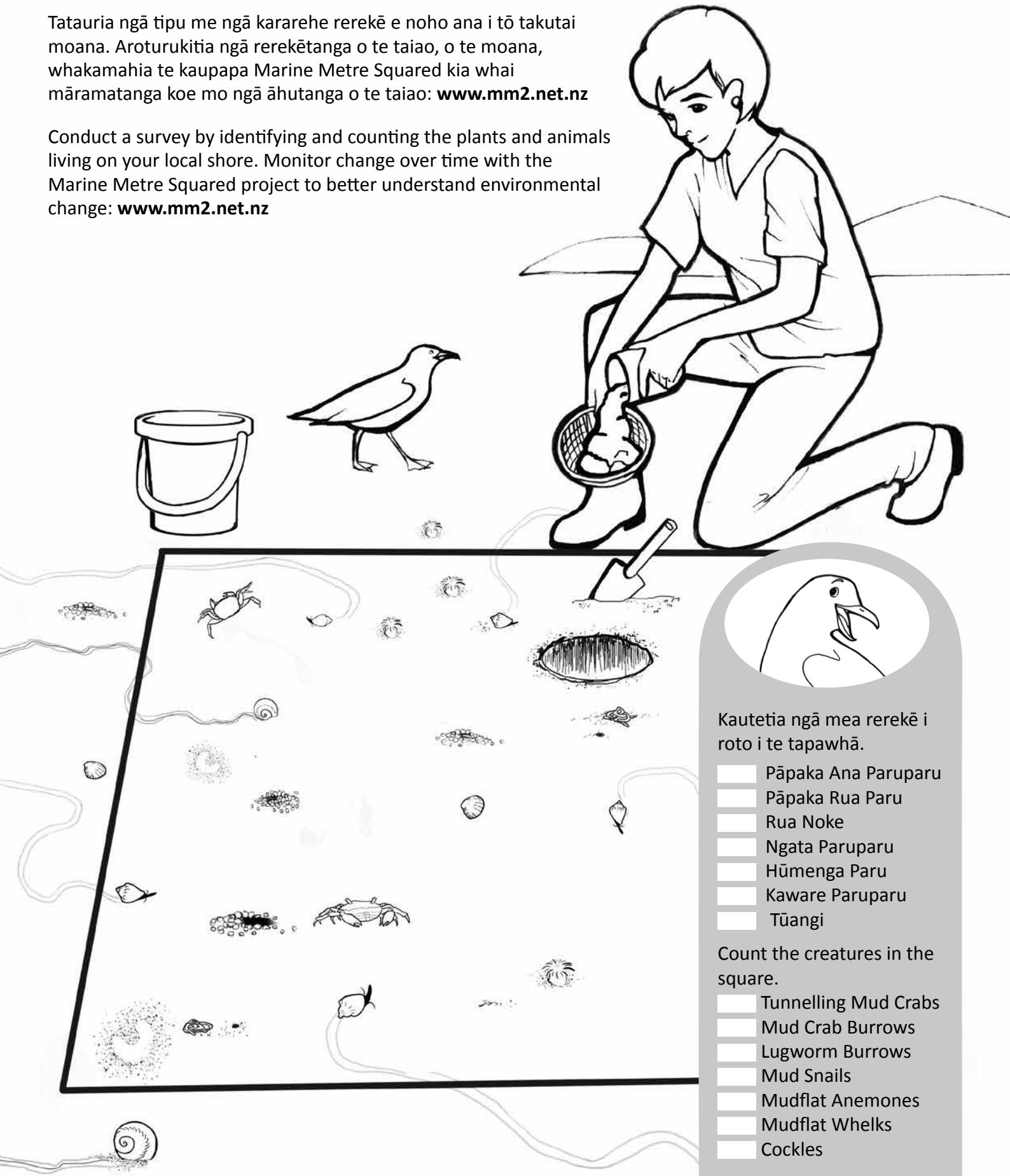
- Black Swan
- Heron
- Kingfisher
- Oyster Catcher
- Red-Billed Gull
- Pied Stilt

.

Tatauranga Tahatai
Seashore Survey

Tatauria ngā tipu me ngā kararehe rerekē e noho ana i tō takutai moana. Aroturukitia ngā rerekētanga o te taiao, o te moana, whakamahia te kaupapa Marine Metre Squared kia whai māramatanga koe mo ngā āhutanga o te taiao: **www.mm2.net.nz**

Conduct a survey by identifying and counting the plants and animals living on your local shore. Monitor change over time with the Marine Metre Squared project to better understand environmental change: **www.mm2.net.nz**



Kautetia ngā mea rerekē i roto i te tapawhā.

- ☐ Pāpaka Ana Paruparu
- ☐ Pāpaka Rua Paru
- ☐ Rua Noke
- ☐ Ngata Paruparu
- ☐ Hūmenga Paru
- ☐ Kaware Paruparu
- ☐ Tūangi

Count the creatures in the square.

- ☐ Tunnelling Mud Crabs
- ☐ Mud Crab Burrows
- ☐ Lugworm Burrows
- ☐ Mud Snails
- ☐ Mudflat Anemones
- ☐ Mudflat Whelks
- ☐ Cockles

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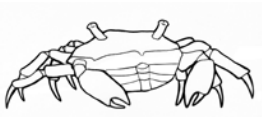
He Rārangi Ingoa



Pāpaka ana paruparu - Ko ōna karu kei runga i ngā kakau e rua kia kite ia i waho atu o tōna rua. Nā te āhua o tōna anga tē tāea te kite i a ia i te paruparu.

Ngata Hāona - He iti, he tūpuhi, he wheuri hoki tōna tai. Ka kitea te ngata nei i te paru i waenga i ngā kōhatu hoki. Ka kai ia i ngā pūkohu wai.

Ngata Paruparu - Ka kai te ngata nei i te wā ka timu te tai, ā, ka huna i a ia anō i te wā ka pari te tai. Ka kai ia i ngā tipu iti nei e noho ana i te karetai.

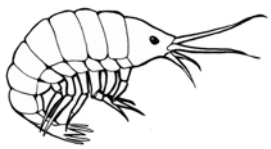
Kawari Paruparu - he kaihamu-hamu tēnei kāwari. Ka huna ia i raro i te paru, ā, ka puta ia ki te kai ki te hongi ia i tētehi mea pirau.

Ngata Paruparu kaimanga - Ka kitea tēnei ngata kaimanga i ngā tahataha o te rimurimu. I te wā ka timu te tai he kuaha pakupaku nei te hanga ka hangaia e te ngata nei ki kore tōna kiri e māroke haere.

Moamoa - He nui tōna hanga, ka huna ia i raro i te paru rite tonu ki te pātiki. Ka tipu ia ki te 45cm.

Pātiki - Ka noho ngā ika pāraharaha i ngā wai papaku, ēngari he uaua ka kite i a ia ki te kore ia e nuku haere. Ka panonitia e ngā pātiki o rātou tai kia ōrite ki te taiao e noho ana a ia. Ka huna rātou i o rātou paihau ki raro i te paru kia kore rātou e kitea e te tangata.

Paihau Toru - Ka kitea ia i ngā puna i te kōraha, ka panoni ia i tōna kiri kia rite tonu tōna āhua ki te taiao.



Ngārara Pekepeke - Ka noho te ngārara pekepeke i raro iho i te karetai, ko tōna kai he rimurimu, he ika pirau rānei. Ka pekepeke haere rātou pēnā rātou ka whakararua e tētehi mea.

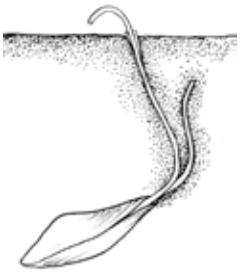
Koura Rangi Kēhua - Ka keri ia i tētehi rua he 60cm te hohonu. Ko te tomokanga he rite tonu ki te puia.

Koura Rangi Nui - Ka keria e ia tētehi rua poutū, ā, ka wehe ia i te rua i te wā ka pari te tai. He whero te ūpoko o te wahine, ā, he kākariki tōna tuara. Ko te tāne he āhua mangu tōna āhua.

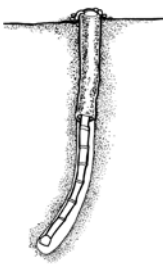
Hūmenga Koraha - He iti tōna hanga, he parauri tōna tai. Ka piri atu ia ki ngā mea māro, pēnā i te tūangi kia kore ia e horoia e te wai.

Tūangi - He kai nui tēnei o Aotearoa. Ka rapua te tūangi i raro iho i te onepū i te wā ka timu te tai.

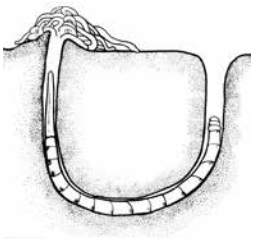
Pipi - Ka kitea te pipi i ngā wāhi oneone. He maeneene tōna anga.



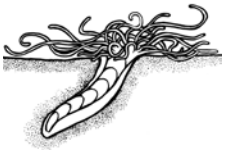
Hanikura - He tapatoru te hanga kia māmā noa tōna totohu i tōna rua. Ko tētehi o ōna ngongo ka ngote i ngā kai, ā, ka waihō i tētehi momo tapuwae i te onepū e rite ana ki tērā o te manu.



Noke Inanga - He noke itie noho ana i raro i te karetai, ā, kua haumarutia te noke inanga e tētehi momo hupe. Ko te tomokanga o tōna rua he pūhanga paruparu.



Noke nui - He noke mōmona, he parauri tōna tai. Ka takoto pērā ki te hangao te reta U kie tata tonu tōna whiore me tōna ūpoko ki te karetai. Ka mōhiotia tōna oranga na ngā niko paru.



Noke Rimurapa - Ka noho ia ki ngā rua. He rite tōnu tōna hanga ki te pāraoa rimurapa. Ko ōna ngongotua amakē ka kitea, ma ngā ngongotua ōna kai e kohi.

Wāna Pango - He manu mangu nō Ahitereiria, he whero hoki tōna waha. Ko ōna kai he pātiti moana, he tipu hoki. Ko tōna kōanga he rākau, he pātītī hoki.

Karoro - He maha ngā karoro rerekē i Aotearoa. Ko te karoro waha pango te mea nui rawa, he kōwhai ōna waewae, he mā ōna raukura, ā, he pango ōna parirau. Ko te Tarāpunga te karoro whero, he whero tōna waha me ōna waewae, ā, he kiwikiwi ōna parirau.

Matuku Waitai - Ka kitea tēnei manu i ngā tataha o te waitai, ki reira ia kohi kai ai. Ko tōna kōanga kei rō rākau.

Kōtare - Ka noho ia ki rō rākau, ki runga rānei i ngā pou kia āta mātaki ia i ngā mea hei kai mōna. Ko tōna kōanga kei rō rākau, kei ngā tahataha o te hiwi rānei.

Tōrea - He pango, he mā hoki ōna tae. He roa tōna waha kia māmā noa tōna kohi kai.

Turuturu Pourewa - Ka noho ēnei manu ki ngā ngutuawa, ko tōna kōanga he tata ki te wai. Ka kai ia i ngā noke, ngā pipi me ngā tio hoki.

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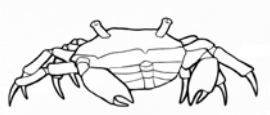
Creature Key



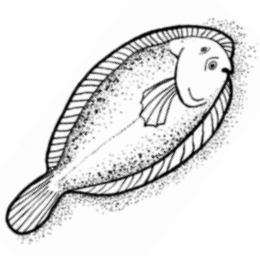
Tunnelling Mud Crab - It has eyes on stalks so it can peek out of its burrow. Its muddy colour provides camouflage to avoid predators.

Horn Snail - Small, narrow, and dark in colour, this snail is found on mudflats and between rocks. It eats algae and sediment to extract the nutrients.

Mud Snail - This snail feeds when the tide goes out, and then buries itself in mud when the tide comes in. It feeds on microscopic plants in the surface layer of the sediment.

Mudflat Whelk - This intertidal mudflat and shallow water snail is a scavenger. It burrows beneath the mud and comes out to feed when it smells dead and dying animals.

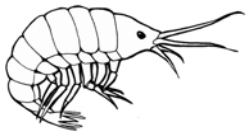
Mudflat Topshell - This vegetarian snail is usually found near seaweed and seagrass beds. At low tide, the snail pulls a door (called an operculum) across the shell opening, which prevents it from drying out.



Flatfish - Juvenile flatfish are present in shallow water off many of our beaches but are hard to find until they move. Flounders and Sole change their colouration pattern to match their surroundings. They wiggle their fins and throw sand over their fin edges obscuring their outline.

Stargazer - This fish is much larger than it seems as it buries most of its body in the mud, with only its head, large mouth and upward-facing eyes exposed. It grows up to 45 cm in size.

Triplefin - Found in shallow pools on the mudflat, this small fish changes colour to blend in with its surroundings. It gets its name from the three fins on its back.



Amphipod - Found on most shores, the amphipod lives just under the surface, eating and recycling nutrients from dead material, especially seaweeds. The species on sandy beaches jump when disturbed, hence the common name “Sand Hopper”.

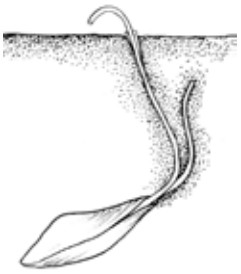
Ghost Shrimp - It constructs a burrow down to a depth of about 60cm. The entrance resembles a crater and the exit looks like a volcano-shaped mound. The Ghost Shrimp seldom leaves its burrow.

Mantis Shrimp - It excavates a vertical burrow, which it leaves at high tide for short periods, especially at night. The female has an irregular red band along the back flanked with dark green. The male has a sparse pepper-coloured body pattern.

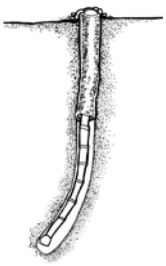
Mudflat Anemone - Small and brown in colour. It attaches to hard surfaces, often a Cockle. This prevents it from being washed away, but also camouflages the Cockle.

Cockle - This bivalve is common throughout New Zealand and prized as food. It is found just beneath the surface of sand and mud banks exposed at low tide. It has a ridged shell.

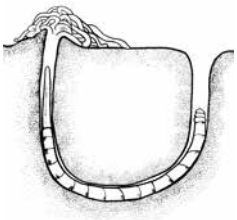
Pipi - A bivalve found on sandy beaches and in the silt and mud of estuaries. Its shell is smoother than that of the Cockle.



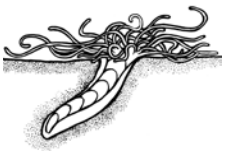
Wedge Shell - It has a large triangular foot and slender shell shape making deep burrowing easier. When buried it turns its shell to lie on its side, the bent shell edge allows its siphons to curve upward smoothly. When feeding, one siphon curls over to suck up food particles from the surface like a vacuum cleaner, leaving behind markings similar to a bird's footprint.



Bamboo Worm - A small worm that lives beneath the surface protected by a thin tube casing made of mucus and sand grains. Burrow openings are marked by small piles of mud.



Lugworm - A thick-bodied darkish brown worm with tufts of gills on the middle third of the body. It lies in a U-shaped mucus-lined burrow so the head and the tail almost reach the surface. Its presence is indicated by coils of mud.



Spaghetti Worm - This lives in burrows or crevices. Long spaghetti-like tentacles are often the only part of the worm that is visible. The tentacles are used to find food particles on the sediment surface and carry them to the worm's mouth.

Black Swan - Introduced from Australia, this large bird has black feathers and a red bill. It eats marsh and water plants such as sea grass. Its nest is a ground level mound of sticks, reeds and grasses.

Gulls - On the NZ seashore we see three species of gull. The Black-Backed Gull is the largest. It has a yellow bill and legs, white body and black wings. The Red-Billed Gull has a red bill, red legs and grey wings with black and white spotted tips. The Black-Billed Gull is similar in appearance, but has a finer black bill and reddish-black legs.

Heron - This bird is found by fresh water and on sea shores where it hunts for fish, standing in the shallows on its long legs. It builds its nest in a tree.

Kingfisher - Usually spotted perching on a pole or branch where it looks out for prey. It dives from a height when it spots a small fish. The Kingfisher nests in a burrow in a bank or a hole in a tree.

Oyster Catcher - The Pied Oyster Catcher is black and white; the Variable Oyster Catcher can be pure black. Both have long red bills which are good for probing for amphipods and for opening bivalves. The Oyster Catcher nests on the high shore.

Pied Stilt - Found in marshy areas and estuaries, it nests close to water. It eats worms, larvae and bivalves like clams and oysters which it often finds by wading in the water.

University of Otago
ŌTĀKOU WHAKAIHU WAKA

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