

The New Zealand cockle (tuangi)

Austrovenus stutchburyi (called *Chione stutchburyi* in older books)

Cockles have two similar shells (valves) hinged together -they are bivalve molluscs. They grow to 40mm wide and live for up to 20 years.

They live just below the substrate surface in muds of fine sand or sandy silts in the intertidal zone. They survive best when the tides cover them for about 18 hours a day, and they cannot survive if covered for less than 3 hours. They withstand some dilution of sea water by fresh water but are harmed if the mixture is more than half fresh water.

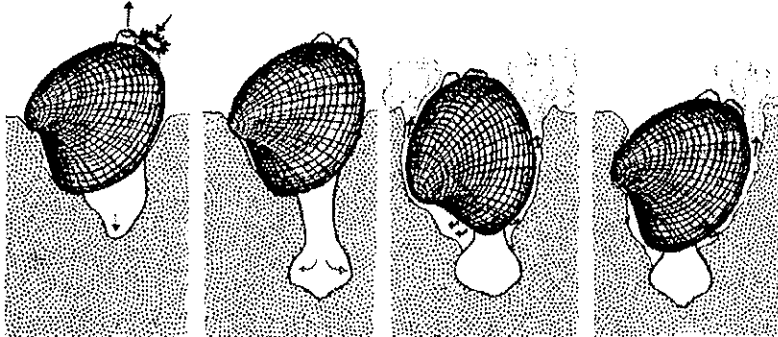
Burrowing

Cockles move using a hollow tongue-shaped foot. When burrowing downwards the muscular foot pushes into the sand and the tip agitates. This changes hard wet sand into quicksand for a moment. The cockle then closes its shell a little and pushes blood into the foot which makes it swell at the tip, and form an anchor. Then it shortens the foot and pulls hard down against this anchor. It rocks first the front, then the back of the shell down into the sand. At the same time it squirts out little jets of water beside the shell so it is more easily pulled into the sand.

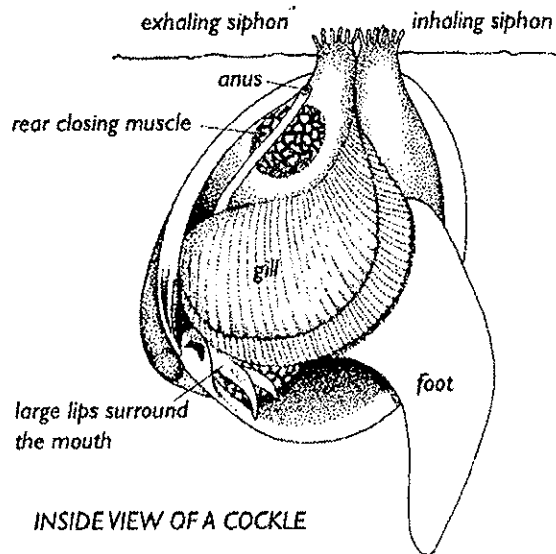
Feeding

Cockles are filter feeders. They draw water in (inhale) through a tube-like siphon and pump it out (exhale) through another siphon.

How a cockle burrows



Adapted from Walsby, *Nature Watching at the Beach*. 1990. The diagram of the interior of a cockle is from Healy (ed), 1980. Other illustrations are from Walsby.



INSIDE VIEW OF A COCKLE

The cockle is usually just below the surface of the mud, with its siphons opening just above. When the tide comes in, sea water brings microscopic floating plants (plankton) which are the main cockle food. Sea water also carries dissolved oxygen from the air. Water is drawn in and passes through the gills. The gills do two jobs — take in oxygen, and filter out food particles. Tiny hairs wave the food over the gills towards large lips around the mouth.

The cockle pumps water, undigested food and body wastes out through the exhaling siphon.

— What could be the effects of heavy rains and muddy water on cockles?

Key words

- anus
- bivalve
- dilution
- exhale
- inhale
- intertidal
- intestine
- filter
- mollusc
- sieve
- silt
- siphon
- substrate

Information on adaptations to environment
Science L4.2; 5.2

Investigating the cockle

(Maori name tuangi)

Investigating the special features a cockle uses to feed and protect itself

Your teacher will arrange for you to watch a cockle feeding. A few drops of soup added just above the cockle will help you see what happens.

Key words
 filter
 hinge
 inhale, exhale
 microscopic
 pump
 sand, silt,
 clay, mud
 siphon

Questions

- How much of the cockle is under the sand?
- Is it helpful for a cockle to be under the sand while it feeds?

Can you see two tubes peeping through the tops of the shells into the water? The inhaling tube draws water in. The exhaling tube pumps water out.

Sea water carries microscopic floating plants that are food for cockles.

Rule lines from these labels to the correct places on the picture:

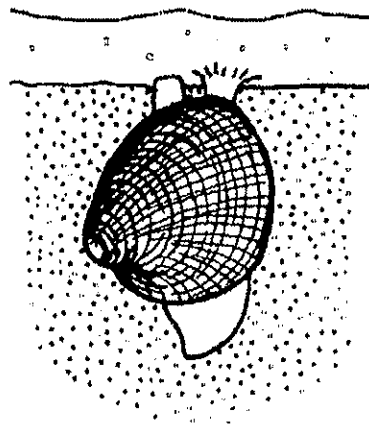
Cockles' food floats in sea water

Level of top of sandy mud

Exhaling tube (siphon)

Most of the cockle is under the sand

Foot used for movement

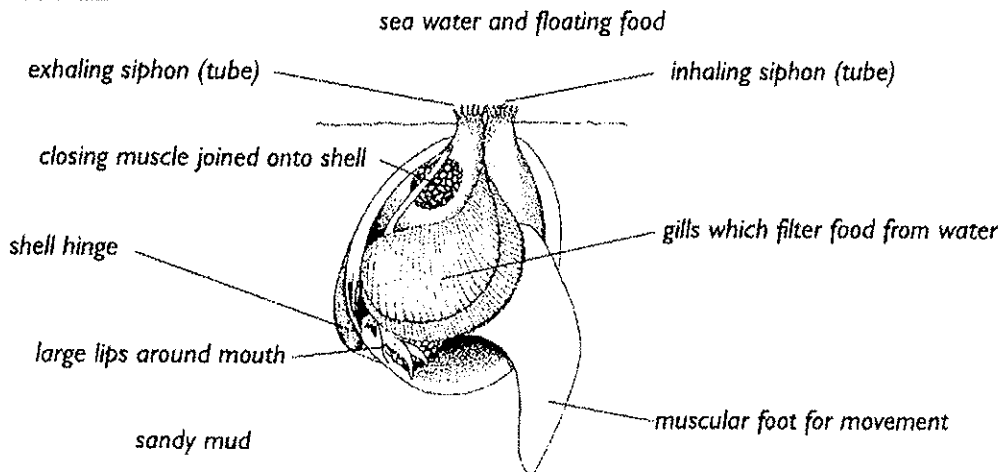


Inhaling tube (siphon)

Hard shell protects the soft body parts

- What two things protect the cockle while it is feeding?

INSIDE A COCKLE



Reference: Walsby, *Nature Watching at the Beach*, 1990
 Illustrations from Walsby (upper) and Healy 1980 (lower)

Group investigation
 Science L3 2

Cockle Cards: How cockles feed

Sharing information about special features that help cockles feed and stay alive

Before trying the activity, groups should watch a cockle feeding, either in its habitat or in a glass jar with sandy mud collected from its habitat.

- Cut around the cards below. Each person in the group has one card, but does not show it to anyone else.
- Each person in their own words tells others in the group what is on their card. The group writes a report describing how a cockle feeds.

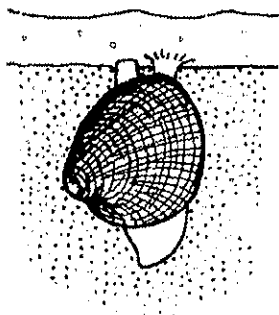
Key words

digest
exhale
filter
inhale
siphon
tentacles

How cockles feed — A

Cockles are filter feeders.

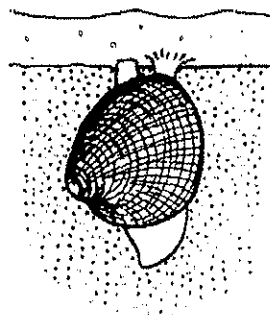
Water and small pieces of food are drawn in through a tube called a siphon.



How cockles feed — B

Cockles' food includes tiny floating plants and animals, and eggs of animals.

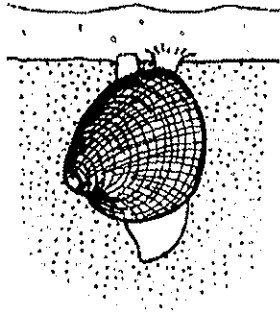
The inhaling siphon draws water in.



How cockles feed — C

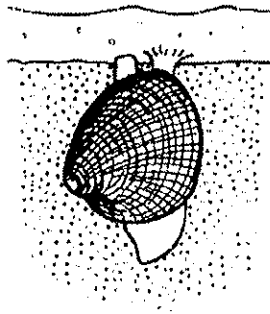
The exhaling siphon squirts out undigested food and wastes.

A crown of tentacles surrounds the openings to the siphons.



How cockles feed — D

Short tubes that reach up to the surface of the mud are called siphons. Water is drawn in, filtered through gills, and pumped out again.

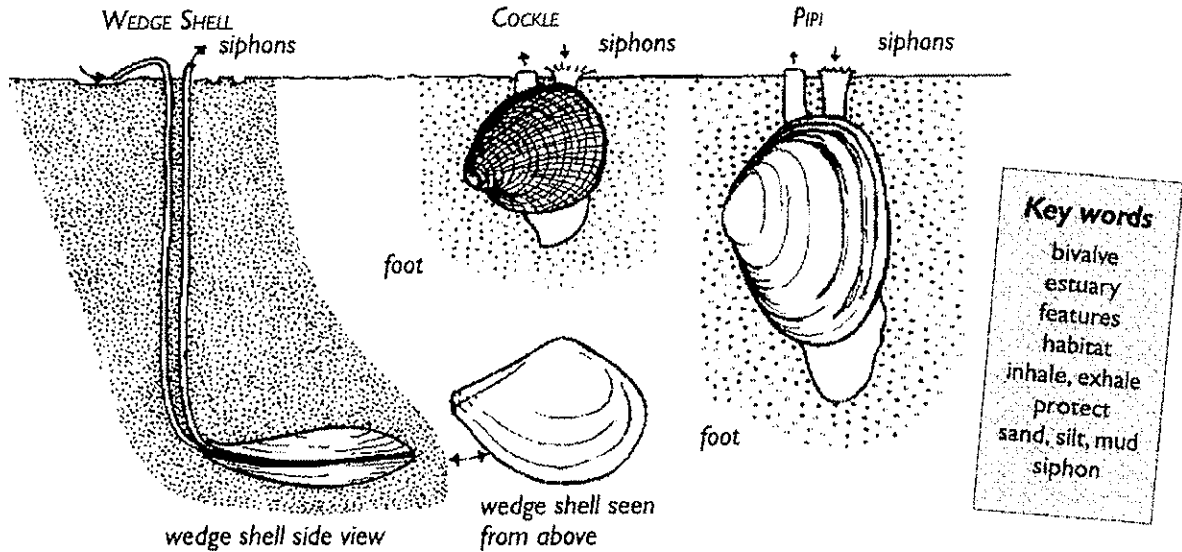


Comparing shellfish of the mud flats

Investigating features of the pipi, cockle and wedge shell that help these animals stay alive

At the estuary you may find several different sorts of shellfish. The picture below shows three common bivalve shellfish found in Pauatahanui Inlet

THE THREE SHELLFISH AT HOME



Look carefully at the pictures, or look at live animals if you found them.

— How are they ALIKE? What features are the same in these three animals?

The pipi, cockle and wedge shell all have these parts to their bodies:

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The three shellfish usually live below

and feed by

What features protect them while they are feeding?

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What are their DIFFERENCES?

• How deeply is each shellfish buried?

• What does the shading around the shellfish in the pictures tell us?

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• How are the shellfish protected from birds or fish that might eat them?

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