**ACTIVITY: Labelling a cockle/tuangi**

**Activity idea**

In this activity, students use online and/or paper resources to identify and label parts of a cockle/tuangi.

By the end of this activity, students should be able to:

* identify and label some of the structures of a cockle/tuangi
* consider the function of these structures
* discuss how these functions help the cockle/tuangi survive
* use literacy skills to learn about and discuss the functions of the structures.

**For teachers**

***Introduction/background***

The [New Zealand cockle](https://www.sciencelearn.org.nz/resources/148-cockles), also known as [tuaki](https://www.sciencelearn.org.nz/images/5018-tuaki) or tuangi, is endemic to Aotearoa New Zealand’s coastal areas. They are filter feeders and are well adapted to their preferred habitat of soft mud and fine sand in subtidal areas – living just a few centimetres under the sediment surface. The shellfish perform key [ecosystem services](https://www.sciencelearn.org.nz/images/4623-ecosystem-functions-and-services) and are a source of [mahinga kai](https://www.sciencelearn.org.nz/resources/3174-mahinga-kai).

***Structural adaptations***

Cockles are useful for exploring the concept of structural adaptation. They have specific structures that allow them to feed and stay safe within a dynamic marine environment.

Following are some examples of their structural adaptations.

External anatomy:

* Cockles have a sturdy shell that is made of several layers and protects the soft inner parts from predation and/or damage from wave action.
* The shell is watertight and able to hold a reservoir of water to sustain the cockle if it is dislodged or exposed during low tide.

Internal anatomy:

* Cockles have special structures including an inhalant siphon and gills that allow them to take in seawater and filter plant material and microscopic animals for food. Gills have a dual purpose: they obtain oxygen for respiration and direct food into the mouth.
* Cockles are able to select food filtered from the water. Indigestible food passed to the mouth is rejected by the palps and discarded as pseudofaeces.
* The foot is a muscular organ used to burrow into the sediment and anchor the shellfish. Cockles use this foot to move and even ‘jump’ by bending and straightening it.
* The exhalant siphon expels seawater after it has been filtered for food and oxygen.

***What to do***

1. Use the articles [Cockles](https://www.sciencelearn.org.nz/resources/148-cockles) and [Adapting to marine habitats](https://www.sciencelearn.org.nz/resources/1126-adapting-to-marine-habitats) for background information on cockles, their habitat, roles within the ecosystem and adaptations for life in a tidal environment. Other helpful resources include [tuangi (cockles)](https://niwa.co.nz/te-kuwaha/tuangi) from NIWA’s Taonga Species Series and the FAO’s [taxonomy and anatomy information on bivalves](https://www.fao.org/3/y5720e/y5720e07.htm).
2. Discuss what life is like in a tidal environment. What adaptations enable cockle/tuangi to live there?
3. Discuss the structures of these adaptations and how they help the cockles to function.
4. Complete the interactive [Label the cockle/tuangi](https://www.sciencelearn.org.nz/labelling_interactives/17-label-the-cockle-tuangi) or use the paper-based version in the [student handout](#bookmark=id.2jxsxqh).

***Extension ideas***

[Tuaki](https://www.sciencelearn.org.nz/images/5018-tuaki)/tuangi are an important food source for many people. Explore food and resource-gathering traditions practised by Ngāi Tahu whānau in Te Waipounamu – this is part of the interactive [Mahinga kai – natural resources that sustain life](https://www.sciencelearn.org.nz/image_maps/124-mahinga-kai-natural-resources-that-sustain-life).

[Mussels](https://www.sciencelearn.org.nz/resources/1421-mussels) are also filter-feeders. Compare the habitats and adaptations of mussels and cockles.

***Label the cockle/tuangi – answers***

Diagram

Description automatically generated

**For students**

***Label the cockle/tuangi***

Use labels to identify the parts of the cockle/tuangi.

Diagram

Description automatically generated

|  |  |
| --- | --- |
| **Labels** | **Description** |
| adductor muscles | Muscles that close the valves of the shell when they contract. |
| exhalant siphon | Expels seawater and inedible matter from the body. |
| foot | Muscular organ used for movement and for burrowing into the sediment. |
| gills | Filters seawater for oxygen and to capture food. |
| inhalant siphon | Draws seawater into the body. |
| intestine | Tightly curled structure connecting the stomach with the rectum. |
| palps | Directs large particles, which are not ingested, into the exhalant water stream. |
| shell | A hard layer made mostly of calcium carbonate that protects the soft body. |