THE STRUCTURE AND FUNCTION **OF GREEN-LIPPED MUSSELS**

NZ CURRICULUM ACHIEVEMENT OBJECTIVES LEVEL 1-4 SCIENCE

NATURE OF SCIENCE: UNDERSTANDING ABOUT SCIENCE, INVESTIGATING ABOUT SCIENCE, COMMUNICATING IN SCIENCE

ACTIVITY 1: Let's Investigate how they work

YOU WILL NEED

- Fresh green lipped mussels from your local supermarket
- Collect 5 litres of murky sea water from a local beach (the murkier the better)
- Make your own sea water by adding 35 grams (6 teaspoons) of salt to 1 litre of tap water
- To make it cloudy add 1 teaspoon of flour or 2-3 teaspoons of moist soil or mud
- 2 x 1000ml beakers or clear containers with wide necks like preserving jars
- Watch or timer
- Cellphone or device with timelapse software (free apps are available for cellphones)

ECOLOGY

MATHEMATICS AND STATISTICS: STATISTICAL INVESTIGATION

Fill your 2 clear containers with equal amounts of cloudy seawater. Keep the water below 20°C.

LET'S GET STARTED

- Place one green-lipped mussel into one of the containers. This is will be the test sample. Leave the other one as the control.
- Time the experiment and observe the mussel in action as it filters the seawater. Stop the experiment when the seawater becomes clear. Take photos throughout the experiment or take a time lapse movie.
- Express your results as time taken for seawater to clear /1 litre for 1 mussel, this is your filtration rate.



START OF EXPERIMENT



Increase the number of mussels sequentially and record their filtration times. Predict what might happen first.

- Collect your data and present it in a table. You can also express your results as a graph. What does the information in your table or graph tell you? Does it differ from your prediction? Explain why.
- Repeat this experiment but this time weigh the mussels and express your results by weight instead of number.
- Try a different type of shellfish like cockles and pipis.

FURTHER EXPERIMENTS YOU MIGHT LIKE TO TRY

Can you think of any other experiments you would like to try.

ACTIVITY 2: Let's look inside



INTERESTING FACTS

Mussels are a 'mollusc' and have a foot, a shell and a mantle. The mantle makes the shell and produces its colour. Ridges on the shell are growth lines and show how it grows, like the growth rings of a tree. Their shells are made of layers of calcium carbonate, a chemical similar to chalk. As the mussel inside the shell grows, another layer is added to the outer edge of the shell. The oldest part of a shell is called the umbo. The shell protects the mussel from waves and other physical damage, and predators. Mussels are a bivalve (they have 2 shells). Their two shells are connected together by muscles and a hinge and open up allowing the mussel to feed. At low tide the shells are pulled tightly together to prevent water loss. Mussels attach themselves to the seafloor with their byssal threads. Mussels feed by circulating water over their gills and filtering out plankton. They can filter 6-9 litres of seawater an hour.



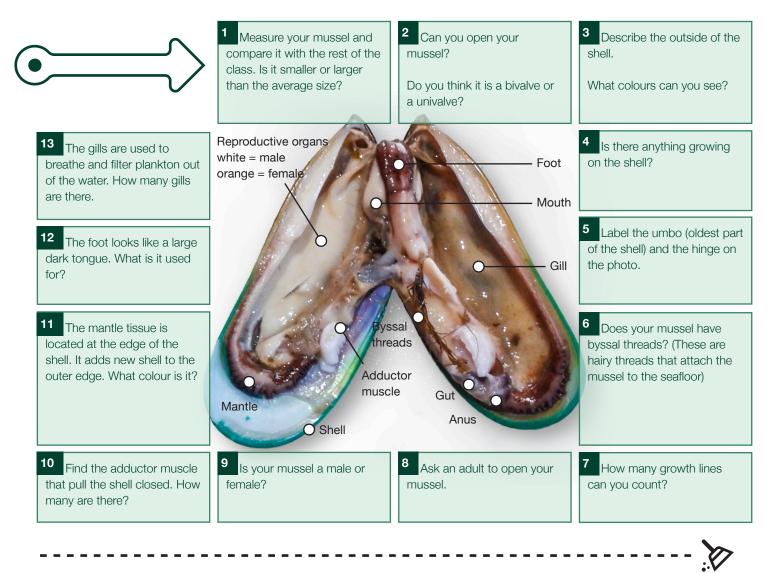
Prior to dissection establish the student's prior knowledge. Discuss the role of mussels in our marine envirronment. REFER TO:

reviveourgulf.org.nz

sciencelearn.org.nz/videos/730-revive-our-gulf

YOU WILL NEED

- Live mussels (in shells) from supermarket
- A knife and an adult to open the mussels
- Trays or newspaper to carry out the dissection on



Adapted from the NZ Rocky Seashore Activities, NZ marine studies centre University of Otago







Revive our Gulf have restored mussel beds near Waiheke and Mahurangi to bring back fish and clear the water. More here goo.gl/eHJHW6