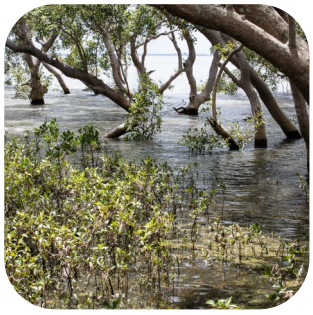
Moreton Bay
ENVIRONMENTAL EDUCATION CENTRE
Inspiring Champions for the Bay

Mangroves and the Environment

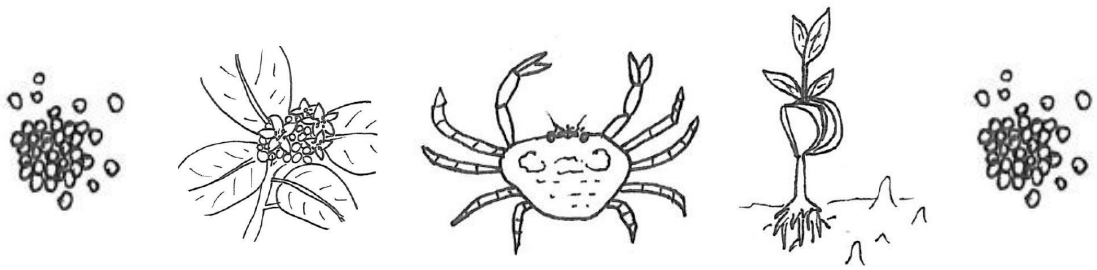
Teacher / Parent / Carer Information





Being connected to place and engaging in hands-on experiences, inspiring curiosity and thinking is always best. We hope that you can join us on Moreton Bay in the future to explore and discover why mangroves are important.

This booklet supports the student booklet providing curriculum links, background information, suggested answers and links for further learning and exploration.



Mangroves and the Environment Year 4 Program

Overview

In the virtual *Mangroves and the Environment* program, students adopt the role of Junior Ecologists to investigate the importance of mangrove forests along Wynnum/Manly foreshore. Students sequence key stages in crab and mangrove lifecycles and gain an understanding of how living things depend on each other to survive.

Throughout this virtual exploration there is a focus on feeding relationships between plants and animals in the ecosystems observed.

A letter-to-the-editor published in the Wynnum Herald provides stimulus, generating questions about the value of mangroves and their importance to humans and other organisms (See page 3).

Learning Intentions

Students, in the role of junior ecologists will:

- Explore open ocean and mangrove ecosystems virtually
- Sequence the key stages in the lifecycles of mangroves and crabs
- Identify the interconnections between plants, animals and the environment (food chains)
- Justify the importance of mangroves in Moreton Bay

Curriculum Intent

Science

Science Understanding

Biological sciences

Living things have life cycles (ACSSU072)

Living things depend on each other and the environment to survive (ACSSU073)

Science as a Human Endeavour

Use and influence of science

Science knowledge helps people to understand the effect of their actions (ACSHE062)

Humanities and Social Sciences

Knowledge and Understanding

Geography

The importance of environments, including natural vegetation, to animals and people (ACHASSK088)

General Capabilities

Critical and creative thinking

Identifying, exploring and organising information and ideas

Reflecting on thinking and processes

Ethical understanding

Understanding ethical concepts and issues

Cross-curriculum Priorities

Sustainability

All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival

Tip for use: used in conjunction with the student booklet, please have your learners watch the video on YouTube when directed (link: https://youtu.be/crGDSfG3kQA).

LETTER TO THE EDITOR

08 NEWS

NEWS 1-20 | LIFESTYLE 18-45 | REALEST 21-36

25 Jan 2017, Wynnum Herald, Megan Dolling

Conversations.

EMAIL editorial@wynnumherald.com.au
WEB questnews.com.au/east
MAIL GPO Box 130, Brisbane, 4001
TWITTER @wynnumherald
FACEBOOK wynnumherald

ARE BAY VIEWS MORE IMPORTANT THAN MANGROVES?

COUNCIL ASKED TO REMOVE PLANTS FROM LOTA TO WYNNUM

BRISBANE City Council has been asked to remove all the mangroves between Lota and Wynnum. Wynnum Manly councillor Peter Cumming said a petition calling for the clearing would be considered at the council's first meeting for the year, on February 7.

Cr Cumming said he was concerned about the growth of mangroves in the bayside, and Lota Park was a good example of an area where some clearing was needed. "In five to 10 years' time, there won't be any view from Lota Park," Cr Cumming said. "As it is, you can see St Helena Island, Green Island, Wellington Point and Stradbroke Island. I think there are grounds for keeping that gap open."

He said the council had previously committed to keeping this gap, but action had not been taken. "About five years ago, the council chairperson said they would keep mangroves down and keep that gap – I think that is important for park users".

Myrtle Beitz, in her book Mangroves to Moorings Revisited, said James Warner, a surveyor in the young colony of Brisbane, noted in his first survey of 1859, that mud and mangroves were fringing the shoreline, but beach breaks occurred north and south of Darling Point.

The council did not respond to detailed questions on the petition but said in a statement: "A petition with six signatures regarding the mangroves has been lodged and the matter is currently being investigated by council. Council's Environment, Parks and Sustainability Committee will consider this petition once this investigation has been finalised."

Have your say. Email editorial@wynnumherald.com.au with your thoughts on the removal of mangroves.

ARE BAY VIEWS MORE IMPORTANT THAN MANGROVES?

What are mangroves?

Mangroves are salt-tolerant plants found along coastal areas and rivers. The Moreton Bay region is home to 7 of the 34 mangrove species in Queensland. Due to salt water flooding their roots and trunks each high tide, these amazing trees have adapted to survive. Their adaptations include:

- Aerial (above-ground) roots called pneumatophores to take in oxygen from the air
- Expelling salt through specials gland in their leaves, allowing only water to be absorbed
- Taking in oxygen through tiny pores in the trunk called lenticels, when even the pneumatophores (roots) are submerged in water.

The key question for students to consider in this booklet is:

ARE BAY VIEWS MORE IMPORTANT THAN MANGROVES?

With so many of these trees living right on our coastline here in Moreton Bay, exploration and investigation in our own backyard will allow students to form opinions on local issues. You may like to visit the North Wynnum Mangrove Boardwalk with your young learners.

1. Mangroves protect shorelines

For thousands of years, mangroves have stood strong on Australian coastlines. Their root systems and structure hold shorelines in place by reducing erosion from wind and wave damage. While they may block views for houses built along the coastline, they reduce wave energy by 37 to 71%, protecting property to the value of $2.7 billion across south-eastern Australia alone. The benefit of mangroves along a coastline prevents people needing to relocate due to property damage, saving the economy massively.

Students are asked to observe the area behind the coastline at Lota Park. By comparing coastlines A and B from the diagram, they will explain what would happen to each coastline if a storm coming from the ocean were to hit. A possible response to this question can be seen below.

If a storm were to hit Coastline A, the mangroves would protect the coastline and the houses behind by slowing down the speed and force of the waves and wind before it reaches the coast. If a storm were to hit Coastline B, the houses may be damaged by the wind and waves as there are no mangroves to slow the wind and water down.

2. Mangroves keep water clear

When land erodes from the coastline at high tide, sediment will travel out to the open ocean with the changing tide unless mangroves are there to trap this sediment. Moreton Bay is home to diverse ecosystems including seagrass and coral reefs. As these producers rely on sunlight for energy, if the water is too murky, they will not survive as sunlight is not able to penetrate the water down to the ocean floor. Marine life that feeds on these producers such as dugongs and turtles will then struggle for food, so the entre ecosystem is affected.

Students are asked to explain why mangrove forests are muddy.

A possible response can be seen below:

Mangroves are muddy because their roots, also called pneumatophores, trap mud when the water comes in and it stays there when the tide goes back out.

3. Mangroves provide habitats for animals

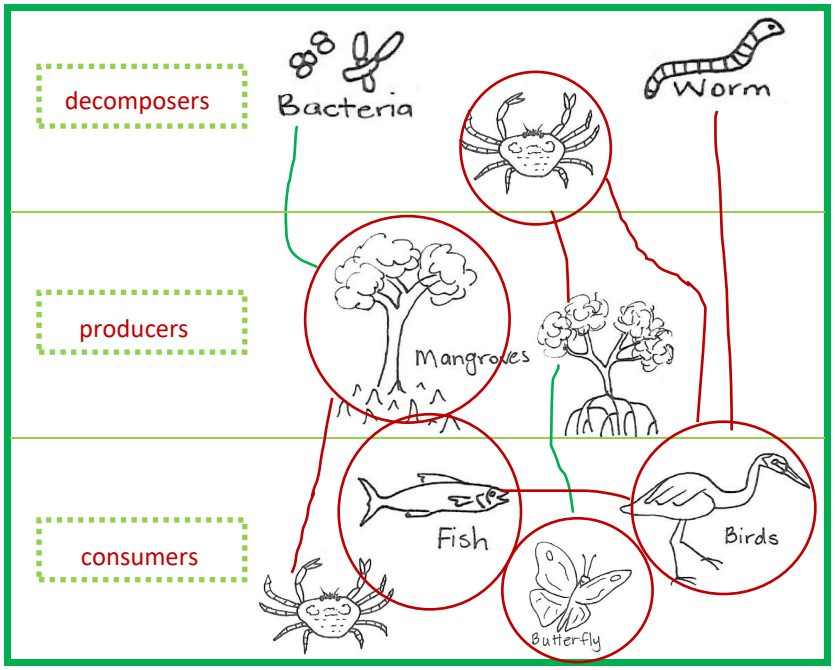
A mangrove forest provides shelter and food for many animals. For many juvenile marine species, mangroves are a nursery, providing a safe, sheltered habitat for them to grow up until they are ready for the open sea. Other examples of habitats include:

- Algae on the surface of pneumatophores (roots) is eaten by snails and crustaceans
- The snails and fish are food for wader birds
- Spiders can make webs and flying fox can rest in trees due to a lack of large wandering animals
- The mud is home to many invertebrates as well as crabs, worms and snapping shrimp
- Oysters and mussels attach to the roots and trunk

After viewing the video highlighting animals found in a mangrove ecosystem, students will:

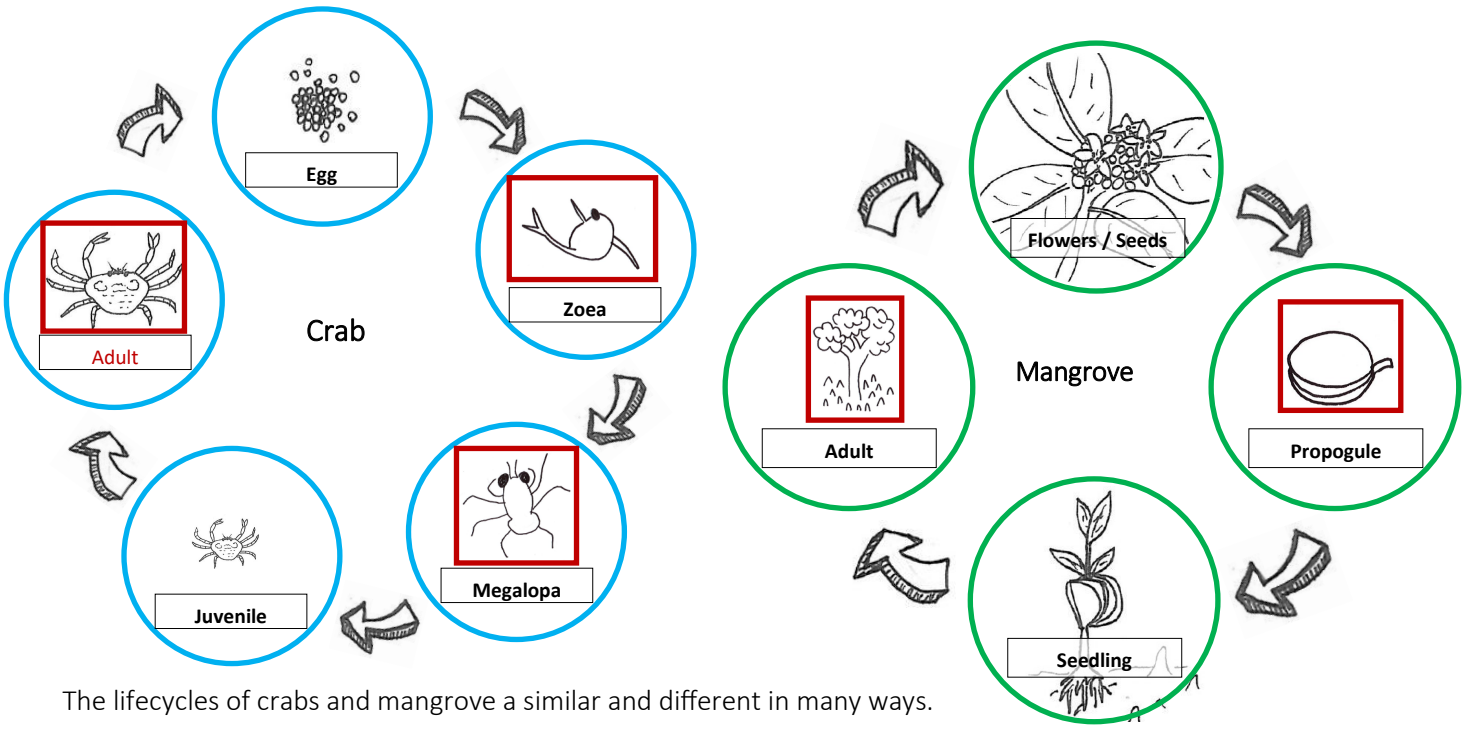
1. Circle the animals identified
2. Label them as decomposers, producers or consumers
3. Connect the organisms that feed on each other

A filled in diagram can be seen below (some links are provided– can you find more?):



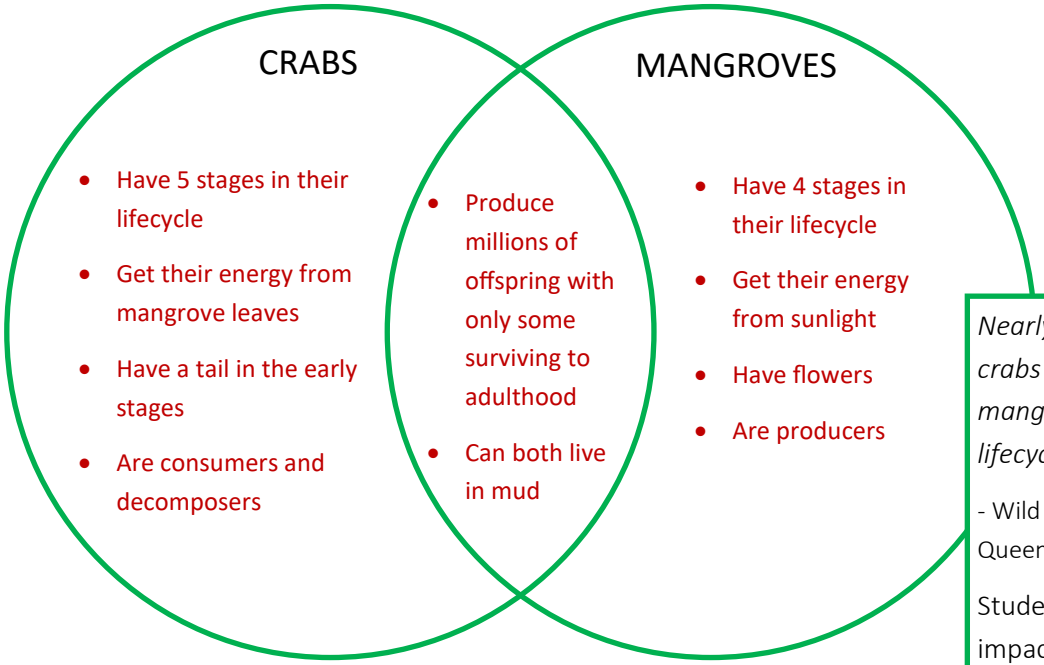
Some crabs live within mangroves and they begin their life as plankton, drifting in the open ocean

Students watch the video and use the attached plankton guide to identify different stages of the crab and mangrove lifecycle to fill out the diagram below



The lifecycles of crabs and mangrove a similar and different in many ways.

Students are asked to organise their ideas in a Venn diagram. Possible responses can be seen below:



Crabs and mangroves are interconnected

Students use the information from the video to complete the following sentences:

Crabs help mangroves by decomposing leaf litter by eating fallen leaves and provide nutrients for the mangroves through their waste

Mangroves help crabs by providing protection and food for crabs

Nearly 70% of the fish, prawns and crabs we eat are dependent on mangroves for at least part of their lifecycle.

- Wild Guide to Moreton Bay, Queensland Museum

Students are asked to explain one impact of removing mangroves on fish, prawns and crabs. A possible response is:

The numbers of fish, crabs and prawns would significantly decrease if they do not have mangroves as one of their habitats. Animals that rely on fish, crabs and prawns for survival will have less access to this food source.

Letter to the Editor

Moreton Bay Environmental Education Centre's vision is 'Inspiring Champions for the Bay.' Each program concludes with a call to action for students to consider how they can make a difference in the future.

The final activity in the booklet requires students to use the information gathered throughout the virtual study to form their own opinion on whether bay views or mangroves are more important in Moreton Bay. A template is provided for students to write their responses in a letter to the editor.

This task also aligns to the Australian English Curriculum:

- Interpret ideas and information in spoken texts and listen for key points in order to carry out tasks and use information to share and extend ideas and information (ACELY1687)
- Identify characteristic features used in imaginative, informative and persuasive texts to meet the purpose of the text (ACELY1689)

Hearing students' ideas at the end of a program day is always our teachers' favourite part of the day. We would love to read any student responses that come our way! You can email us at info@moretoneec.eq.edu.au.

Useful Websites

Check out these other learning sites– they are fabulous too!

Mangrove Watch

http://mangrovewatch.org.au/

ABC Education

https://education.abc.net.au/home#!/media/85976/how-do-mangrove-trees-survive-

ABC Behind the News video

https://www.abc.net.au/btn/classroom/mangrove-warning/10524722

ABC Behind the News teacher resource

https://www.abc.net.au/btn/resources/teacher/episode/20160524-mangrovewarning.pdf

References

The Nature Conservancy Austraila. 2020. *Mapping Ocean Wealth: The Nature Conservancy Australia*. [online] Available at: <https://www.natureaustralia.org.au/what-we-do/our-priorities/oceans/ocean-stories/mapping-ocean-wealth/?gclid=EAIaIQobChMIz8O1rZuy6QIVmHwrCh3J3QzwEAAYASAAEgJJJ_D_BwE> [Accessed 14 May 2020].

Authority, W., 2020. *Mangroves | Wet Tropics Management Authority*. [online] Wettropics.gov.au. Available at: <https://www.wettropics.gov.au/mangroves-info> [Accessed 14 May 2020].

Wetlandinfo.des.qld.gov.au. 2020. *Mangroves And Associated Communities Of Moreton Bay (Department Of Environment And Science)*. [online] Available at: <https://wetlandinfo.des.qld.gov.au/wetlands/ecology/components/flora/mangroves/mangrove-moreton.html> [Accessed 14 May 2020].