



Australian Government
Great Barrier Reef
Marine Park Authority

G R E A T B A R R I E R R E E F

— J U N I O R —

OUTLOOK



ACTIVITY
SHEETS

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The Great Barrier Reef Marine Park Authority is an organisation committed to child safety and to the implementation of Child Safe principles and procedures.

The Great Barrier Reef Marine Park Authority acknowledges the continuing sea country management and custodianship of the Great Barrier Reef by Aboriginal and Torres Strait Islander Traditional Owners whose rich cultures, heritage values, enduring connections and shared efforts protect the Reef for future generations.

IT ALL STARTED WITH A POLYP



Australian Government

Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
JUNIOR
OUTLOOK

reef beat

Activity 1: Coral themed print art

Year level

Year 2 and upwards

Overview

Students create a coral-themed print using string, glue and cardboard.

Outcome

Students will create a work of art to reinforce the information provided in the poster. The artwork will highlight a key learning from the poster for easy reference.



Materials

- String
- Cardboard
- A4 paper
- PVA glue
- Printing ink/paint
- Roller/s
- Newspaper
- Drying rack

What to do

1. Look at display pictures of corals for inspiration.
2. Create a draft plan on a piece of paper including the different corals found on the Great Barrier Reef to create your own coral reef scene.
3. When happy with your design translate the scene by sticking the string onto the cardboard mimicking the shapes you've created. Make sure you use enough glue to make the string stick to the cardboard.
4. When finished allow the string and cardboard to dry.
5. When dry use ink/paint and a roller to coat the string.
6. Place the coated cardboard and string ink coated side down onto a fresh A4 piece of paper and press evenly with your hands or even a clean roller.
7. Carefully lift the cardboard from the paper to reveal your design.
8. Place the finished print onto a drying rack or clear space and allow to dry.

Extend this activity

Carefully coat different areas of the string with separate colours to produce a multi coloured design. You may wish to use a paintbrush to carefully coat the string sections using this method.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability, critical and creative thinking and personal and social.

Visual arts:

Explore ideas, experiences, observations and imagination to create visual artworks and design, including considering ideas in artworks by Aboriginal and Torres Strait Islander artists (ACAVAM106)

Explore ideas and artworks from different cultures and times, including artwork by Aboriginal and Torres Strait Islander artists, to use as inspiration for their own representations (ACAVAM110)

Explore ideas and practices used by artists, including practices of Aboriginal and Torres Strait Islander artists, to represent different views, beliefs and opinions (ACAVAM114)

Use and experiment with different materials, techniques, technologies and processes to make artworks (ACAVAM107)

Use materials, techniques and processes to explore visual conventions when making artworks (ACAVAM111)

Develop and apply techniques and processes when making their artworks (ACAVAM115)

Create and display artworks to communicate ideas to an audience (ACAVAM108)

Present artworks and describe how they have used visual conventions to represent their ideas (ACAVAM112)

Plan the display of artworks to enhance their meaning for an audience (ACAVAM116)

Information links

<http://www.gbrmpa.gov.au/the-reef/corals>

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/climate-change>

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/extreme-weather>

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/declining-water-quality>

<http://www.gbrmpa.gov.au/our-partners/get-involved>

Activity 2: A to Z Great Barrier Reef coral book



Year level

Year 2 and upwards

Overview

Students create a book about coral in the Great Barrier Reef (using Book Creator app) and what can be done to help them become more resilient.

Outcome

Students will develop a ready reference on coral in the Reef, with actions they can take and tell others about how to protect them and be more aware of what impact individual actions can have on the Reef (positive and negative).

Materials

- Device
- Book Creator App

What to do

1. Students research and create an alphabetical list of words for the Great Barrier Reef and include at least five different corals.
Tip: this could be animals, ecosystems or any words associated with coral reefs. For older students you could even use scientific names.
2. Students also research threats and actions which can be taken to help corals.
3. Using the Book Creator app, create an alphabet book of the Great Barrier Reef, one page per letter including a picture of the subject.
4. After the letter 'Z', make one page addressing the threats to corals and a final page with actions we can take to help corals become more resilient. Include pictures.

Curriculum links

General capabilities:

Literacy, numeracy, information and ICT capability, critical and creative thinking and personal and social.

English:

Understand that different types of texts have identifiable text structures and language features that help the text serve its purpose (ACELA1463)

Understand how different types of texts vary in use of language choices, depending on their purpose and context (for example, tense and types of sentences) (ACELA1478)

Understand how texts vary in complexity and technicality depending on the approach to the topic, the purpose and the intended audience (ACELA1490)

Understand how texts vary in purpose, structure and topic as well as the degree of formality (ACELA1504)

Information links

<http://www.gbrmpa.gov.au/the-reef/reef-facts>

<http://www.gbrmpa.gov.au/the-reef/corals>

<http://www.gbrmpa.gov.au/the-reef/animals>

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef>

<http://www.gbrmpa.gov.au/the-reef/reef-health>

Activity 3: Living and non-living diorama

Year level

Year 3 and upwards

Overview

Design and construct a diorama displaying living and non-living things found on the Great Barrier Reef. Include examples of threats to corals and solutions.

Outcome

Students will create a visual, interactive representation of the Reef, reinforcing the learnings from the coral poster and links, including the threats and mitigation actions which they can take.

Materials

- Magazines or tourism brochures with photos of the Reef, corals and other Reef animals
- Scissors, glue, cardboard box, string

What to do

1. Students research corals and marine animals found on the Great Barrier Reef, as well as the threats corals face and possible solutions for inspiration.



View general videos:

- National Geographic: Great Barrier Reef (4:14mins) <https://video.nationalgeographic.com/video/00000144-0a20-d3cb-a96c-7b2de9850000>
- ABC BTN: Great Barrier Reef Problems (3:40mins) <http://www.abc.net.au/btn/classroom/great-barrier-reef-problems/10488602>
- ABC BTN: Great Barrier Reef Solutions (3:12mins) <http://www.abc.net.au/btn/classroom/great-barrier-reef-solutions/10488606>

Great Barrier Reef Marine Park Authority videos:

- <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3040/2/Reef-Beat-Climate-Change-720.mp4>
 - <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3040/3/Reef-Beat-Costal-Development-720.mp4>
 - <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3040/5/Reef-Beat-Land-Based-Run-off-720.mp4>
 - <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3040/4/Reef-Beat-Impacts-of-Fishing-Clip-720.mp4>
 - <http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3040/6/Reef-Beat-Marine-Debris-720.mp4>
2. Students design and construct a diorama displaying examples of living and non-living things which are found on the Great Barrier Reef. Use a cardboard box as the shell for the work. Students need to also include threats faced by corals and other inhabitants on the Great Barrier Reef.
 3. On the outside of the cardboard box, include pictures and written descriptions of positive reef actions we can take to help corals become more resilient.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking

Science:

Living things can be grouped on the basis of observable features and can be distinguished from non-living things (ACSSU044)

Science knowledge helps people to understand the effect of their actions (ACSHE051) & (ACSHE062)

Represent and communicate observations, ideas and findings using formal and informal representations (ACIS060) & (ACIS071)



CRYPTIC CRAWLY CREATURES



Australian Government

Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

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Activity 1: Tiny world art

Year level

Year 3 and 4

Overview

Students create tiny world art to represent the coral crab chasing away the crown-of-thorns starfish.

Outcome

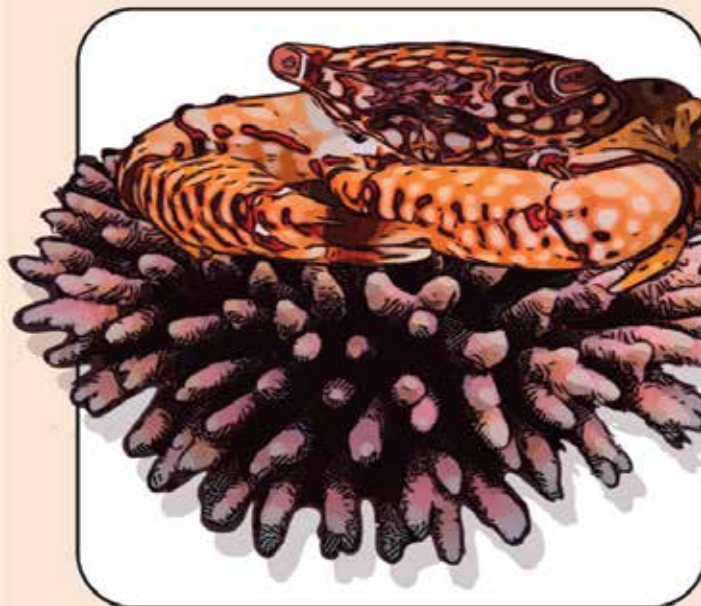
Students learn interactively how natural reef animals, such as the coral crab, can keep natural reef threats in check, and why human intervention can be beneficial when the Reef is under threat from other influences.

Materials

- Household items which can double as miniature items, such as celery tops, broccoli and twigs
- Plasticine
- Camera

What to do

1. Provide example images of tiny world art to students. Helpful websites: <http://littleworldsbigadventures.com/>
<https://www.hellowonderful.co/post/12-incredibly-creative-small-world-play-ideas-for-kids/>
2. View videos to inform students about crown-of-thorns starfish and coral crabs: ABC BTN: Reef Warning (3:40mins) <http://www.abc.net.au/btn/classroom/reef-warning/10531780>
ABC Education: Tackling the crown-of-thorns starfish <http://education.abc.net.au/home#!/media/525269/tackling-the-crown-of-thorns-starfish>
YouTube: Guard crabs defend coral home from crown of thorns starfish (0:56mins) https://www.youtube.com/watch?v=9gpEcFrgE_U
YouTube: This crab doesn't take kindly to home intruders (1:26mins) <https://www.youtube.com/watch?v=lyU27qG9I68>
3. Read Science Magazine: Crabs protect corals from voracious starfish <https://www.sciencemag.org/news/2014/09/crabs-protect-corals-voracious-starfish>
4. Students build a tiny world art piece using broccoli, cauliflower, celery with leaves or other items to creatively represent the coral.
5. Use plasticine to make coral crabs and crown-of-thorns starfish. Students position the crabs amongst the coral and several arms of the crown-of-thorns starfish on top.
6. Students take close-up photos of their creation.
7. Extension opportunity is to use stop motion app to create a scene where the tiny world crab fights off the crown-of-thorns starfish.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking

Visual Arts:

Explore ideas and artworks from different cultures and times, including artwork by Aboriginal and Torres Strait Islander artists, to use as inspiration for their own representations (ACAVAM110)

Use materials, techniques and processes to explore visual conventions when making artworks (ACAVAM111)

Information Links

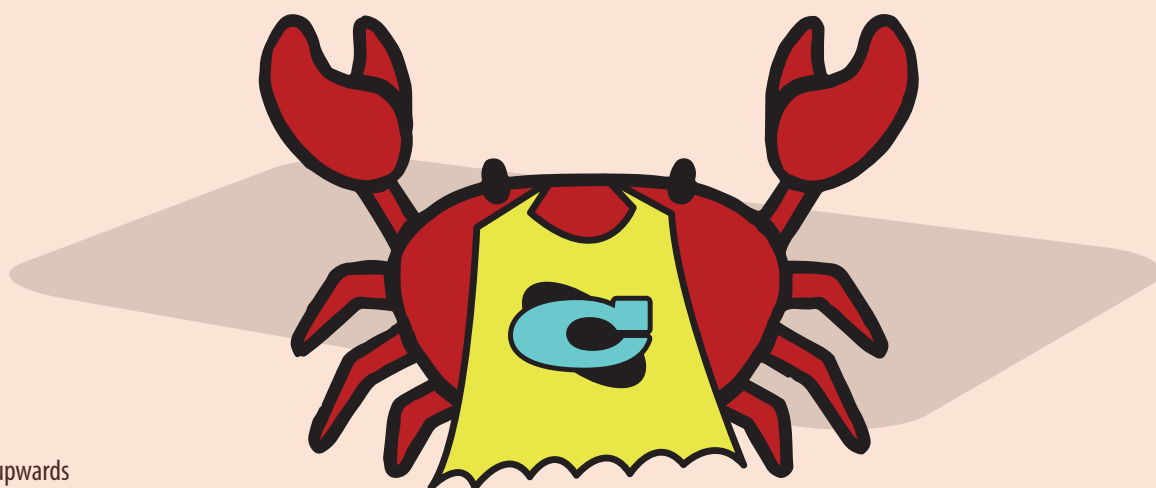
<https://tinyurl.com/yaf5chs9>

(Crown-of-thorns starfish control program)

<https://tinyurl.com/yc9r43av>

(Statement about the crown-of-thorns starfish control program)

Activity 2: Coral crab superhero poster



Year level

Year 2 and upwards

Overview

Design a super hero poster of the coral crab using PowerPoint, Keynote or a handmade poster.

Outcome

Students understand the dynamics between a large predator and a small but determined predator. They learn about natural predators and how the state of the environment can change behaviour. Students learn to present information in a poster format, or as presentation. Students learn to use PowerPoint, Keynote or other presentation program.

Materials

- Cardboard or paper, colouring pens, pencils
- Access to computer for PowerPoint or Keynote

What to do

1. View videos to inform students about crown-of-thorns starfish and coral crab: ABC: Reef warning (4:04mins) <http://www.abc.net.au/btn/classroom/reef-warning/10531780>
ABC Education: Tackling the crown-of-thorns starfish (1:51mins) <http://education.abc.net.au/home#!/media/525269/tackling-the-crown-of-thorns-starfish>
YouTube: Guard crabs defend coral home from crown of thorns starfish (0:56mins) https://www.youtube.com/watch?v=9gpEcFrgE_U
YouTube: This crab doesn't take kindly to home intruders (1:26mins) <https://www.youtube.com/watch?v=lyU27qG9l68>
2. Read Science Magazine: Crabs protect corals from voracious starfish <https://www.sciencemag.org/news/2014/09/crabs-protect-corals-voracious-starfish>
3. Read Reef Beat Poster — Cryptic crawly creatures.
4. Students brainstorm layout of poster. Consider superhero name, the crab's super hero uniform, and the villain. Describe the coral crab's super power.
5. On the poster, include how everyday citizens can help the coral crab on the Great Barrier Reef fight the crown-of-thorns starfish.
6. The poster can be made using PowerPoint, Keynote or on a piece of cardboard.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative Thinking.

Curriculum links Information Links

<https://tinyurl.com/yaf5chs9> (Crown-of-thorns starfish control program)

Visual arts:

Use materials, techniques and processes to explore visual conventions when making artworks (ACAVAM111)



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Great Barrier Reef
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The Junior Outlook Reef Beat presents a series of posters focused on results from the Authority's Outlook Report 2019, introduces some amazing animals seen along the Reef and the actions students can take to protect the Reef.

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BE FISH FRIENDLY



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GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

reef beat

Activity 1: Cubist fish

Year level

Prep and upwards

Overview

This activity can be structured to suit different year levels. Students apply different skill levels to produce a poster or work of art relating to fish and their threats.

Outcome

Students will gain an understanding of fish species in the Great Barrier Reef, and the threats they face, as well as examples of ways individuals can take action to increase fish populations and habitats. They will also learn about the Cubist art movement.

Materials

- Dependent on year level and activity, see each year level.

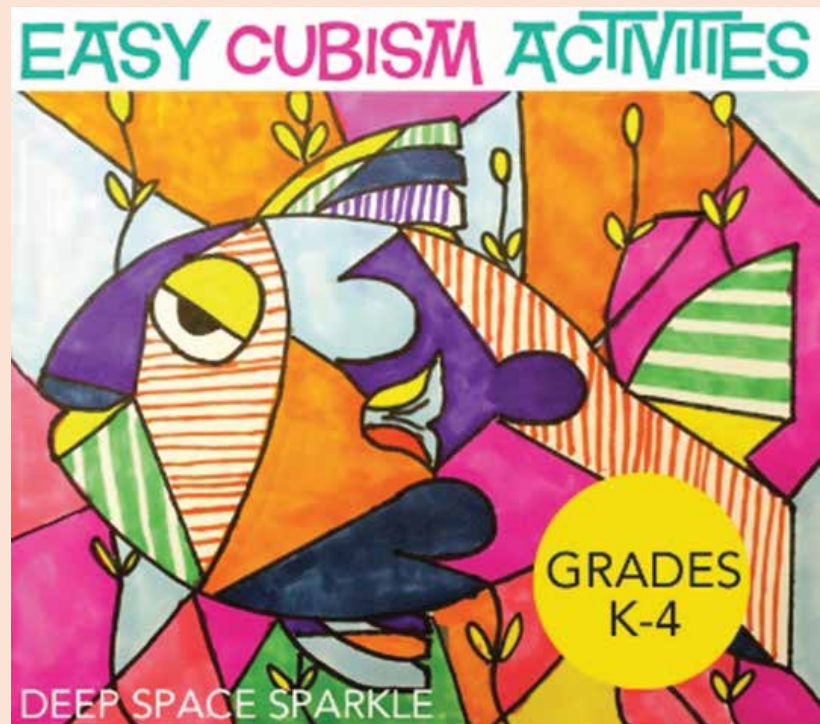
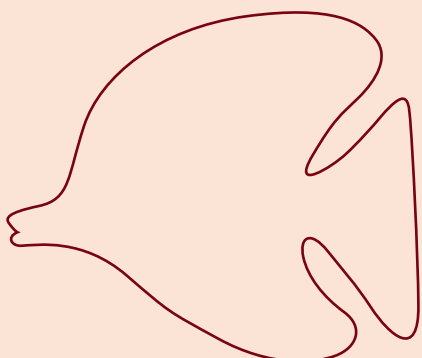
What to do

Prep and Year 1

Provide students with a fish design with lines and segments already included for students to colour in sections. Alternatively, students can draw a fish, cut it up and glue back in a new way. See examples below.

Year 3 and 4

Students can be given a template of a fish and they create their own patterns and lines.



Activity 1: Cubist fish

Year 5 and upwards

Students can create their own piece of Cubist art using a fish commonly caught from the Great Barrier Reef as inspiration. The following videos gives tips and techniques for Cubist art:

YouTube: How to draw cubism art (3:52mins)

<https://www.youtube.com/watch?v=V15rXg1nJ6w>

YouTube: Cubism art drawing tutorial (3:08mins)

<https://www.youtube.com/watch?v=01kEVCxDIVU>

Include a label for the piece of artwork. Frame piece of work using black cardboard, including:

1. artist's name.
2. title of the work and year made.
3. medium used.
4. technique used.
5. information regarding fishing regulations (e.g. size/bag limits and open/close seasons).
6. positive reef practices to help the fish.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking

Visual arts:

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Explore ideas and artworks from different cultures and times, including artwork by Aboriginal and Torres Strait Islander artists, to use as inspiration for their own representations (ACAVAM110)

Explore ideas and practices used by artists, including practices of Aboriginal and Torres Strait Islander artists, to represent different views, beliefs and opinions (ACAVAM114)

Use and experiment with different materials, techniques, technologies and processes to make artworks (ACAVAM107)

Use materials, techniques and processes to explore visual conventions when making artworks (ACAVAM111)

Develop and apply techniques and processes when making their artworks (ACAVAM115)

Create and display artworks to communicate ideas to an audience (ACAVAM108)

Present artworks and describe how they have used visual conventions to represent their ideas (ACAVAM112)

Plan the display of artworks to enhance their meaning for an audience (ACAVAM116)

Information Links

<http://www.gbrmpa.gov.au/access-and-use/responsible-reef-practices>

<http://www.gbrmpa.gov.au/our-work/outlook-report-2019>

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3482>

<http://www.gbrmpa.gov.au/access-and-use/zoning/about-zoning>

Activity 2: Design and create a new fish species to live on the Reef

Year level

Year 5

Overview

Students design and construct a new creature to live on the Great Barrier Reef using the ChatterPix app, and record themselves explaining the adaptations, threats it faces and positive actions which can be taken to reduce the threats. Students should think about the role of their fish and how it benefits the Reef. Additionally, what would happen if it was overfished and removed completely from the Reef.

Outcome

Students will consider structural and behavioural adaptations (sustainability) when creating the new creature. They will learn how to use the program app ChatterPix. They will develop skills in communicating ideas through presentation.

Materials

- ChatterPix app: <http://www.duckduckmoose.com/educational-iphone-itouch-apps-for-kids/chatterpix/>
- Access to the internet for research
- A way to draw their new fish concept and write their descriptive paragraph – pen and paper, keyboard and computer
- Plasticine, sticks, paper, pipe cleaners and more, to create the new fish

What to do

1. Show students an example of a new fish using ChatterPix. See the video:
YouTube: Clownangler Fish https://www.youtube.com/watch?v=R9Jrpu0_iSM
2. Display pictures of fish species found on the Great Barrier Reef for inspiration.
3. View videos to show examples of shapes, sizes, colours and patterns.
YouTube: Types of saltwater aquarium fish (2:51mins) <https://www.youtube.com/watch?v=jllulkrXKqQ>
YouTube National Geographic: Great Barrier Reef | Exploring Oceans (4:06mins) <https://www.youtube.com/watch?v=wbNelN3vVKM>
YouTube: Fishworks adaptation video for elementary students (9:58mins) <https://www.youtube.com/watch?v=0vQedxuFexg>
4. Students draw a design of their new fish to live on the Great Barrier Reef, considering structural and behavioural adaptations.
5. Students construct their creations using plasticine, sticks, paper, pipe cleaners and more.
6. Students then write a paragraph stating the name of their creature, two adaptations, one threat and one positive action we can take to minimise the threat.
7. Using the ChatterPix app, students can take a photo of the fish, draw in a mouth and record their paragraph. ChatterPix has a time limit of 30 seconds.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative Thinking.

Science:

Living things have structural features and adaptations that help them to survive in their environment (ACSSU043)

Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (AC SIS093) & (AC SIS110)

Information links

http://www.gbrmpa.gov.au/__data/assets/pdf_file/0006/247848/Coral-Recovery-A4-Flyer_4Print.pdf

<https://www.youtube.com/watch?v=TS6dMIY0itM&feature=youtu.be>

https://www.youtube.com/watch?time_continue=67&v=DygyYL4dyIU&feature=emb_logo



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DUGONGS

FLOATING FERTILISER FACTORIES



Australian Government

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Marine Park Authority

GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

reef beat

Activity 1: **ozobot** coding challenge

Year level

Year 3 and upwards

Overview

Students program an Ozobot to model how a dugong dodges many threats while travelling to a seagrass meadow for food (e.g. boat strikes we learnt about in the poster). This challenge needs to be in at least A3 size, reducing the size will change code box sizes and it will not work.

Outcome

Students will understand through interactive design and play the challenges facing dugongs in finding food and avoiding predators and other threats. They will gain an appreciation for the work being undertaken by marine scientists to preserve seagrass beds. They will learn entry level open source programming skills and terms.

Materials

- Ozobot STEM kits
- Marker pens or crayons
- A3 paper

What to do

1. Show the students the example of the Ozobot grid pattern (maze) on the following page, and use the Ozobot kit to follow it.
2. Ask your students to design their own grid (maze) using crayons or Ozobot markers.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking

Digital Technologies:

Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)

Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)

Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)

Information Links

<http://www.gbrmpa.gov.au/the-reef/animals/dugong>

https://www.google.com/url?client=internal-element-cse&cx=001530807343196362829:-4fsbpukai&q=http://www.gbrmpa.gov.au/__data/assets/pdf_file/0017/21743/VA-Seagrass-31-7-12.pdf&sa=U&ved=2ahUKEwiH9Pio5HnAhWDwTgGHaoZA20QFjAGegQIABAB&usg=AOvVaw1-P2e2v7HUxN1GJH7j6-zZ

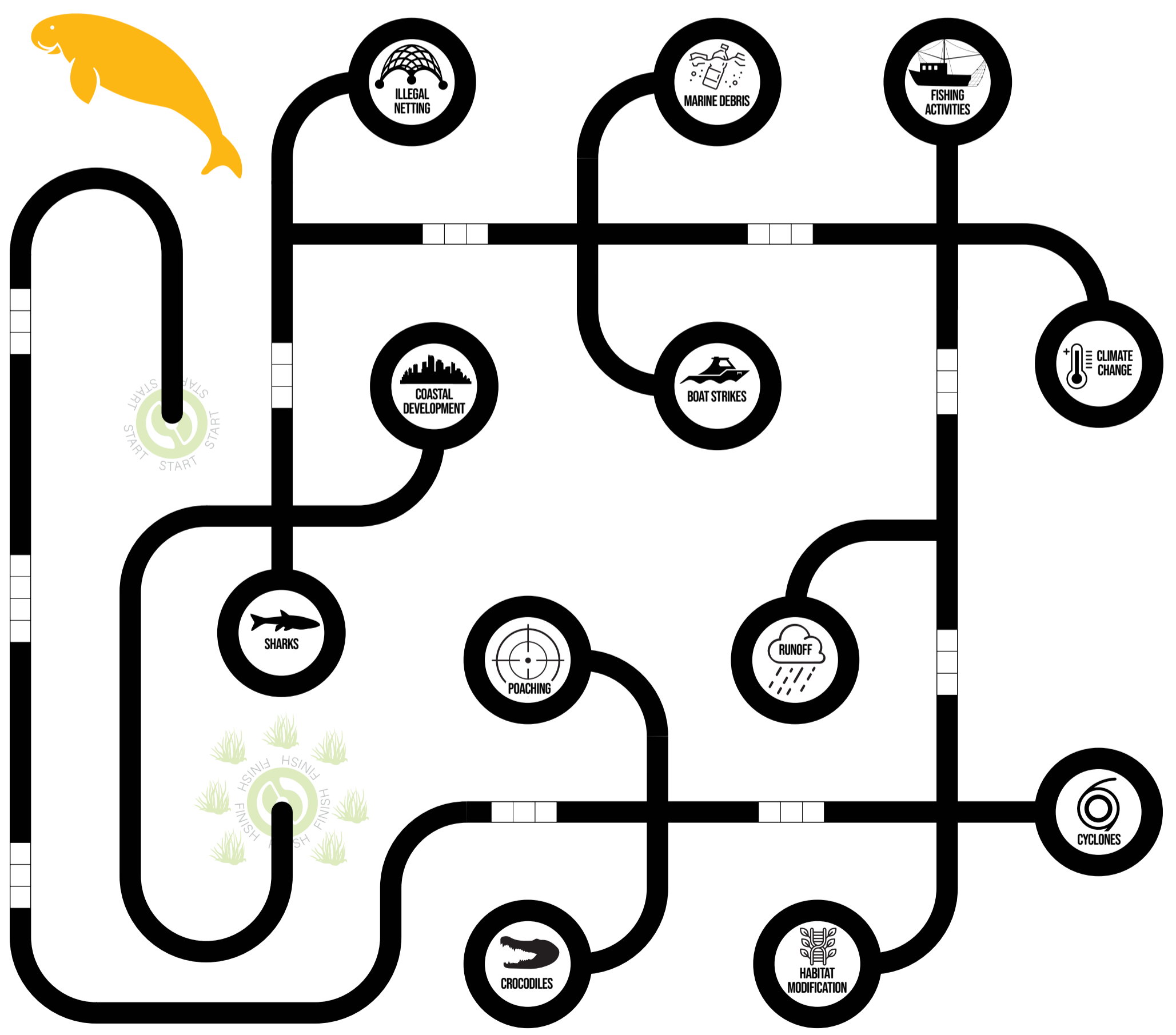
DANGEROUS ADVENTURES OF THE DUGONG

HELP THE DUGONG GET SAFELY TO THE SEAGRASS. CODE YOUR **ozobot** TO TRAVEL THROUGH THE MAZE DODGING THE THREATS TO HER SURVIVAL.



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Activity 2: Research the life of dugongs

Year level

Year 4

Overview

Students create a poster depicting a dugong's life cycle and the threats they face to survive.

Outcome

Students will use research methodology to identify and record (in poster format) a dugong's life cycle, threats and actions being taken to assist their survival. Students will learn about the challenges facing dugongs in finding food and avoiding predators and other threats. They will gain an appreciation for the work being undertaken by marine scientists to preserve seagrass beds.

Materials

- Laptop computer connected to the internet
- Notepaper
- Poster paper and paint, pencils or crayons (or a combination)
- Access to PowerPoint, Book Creator or other presentation program

What to do

1. Research information on the dugong life cycle, living and non-living elements in their habitat, threats being faced at different stages of the life cycle and actions being taken to assist the dugong in the wild.

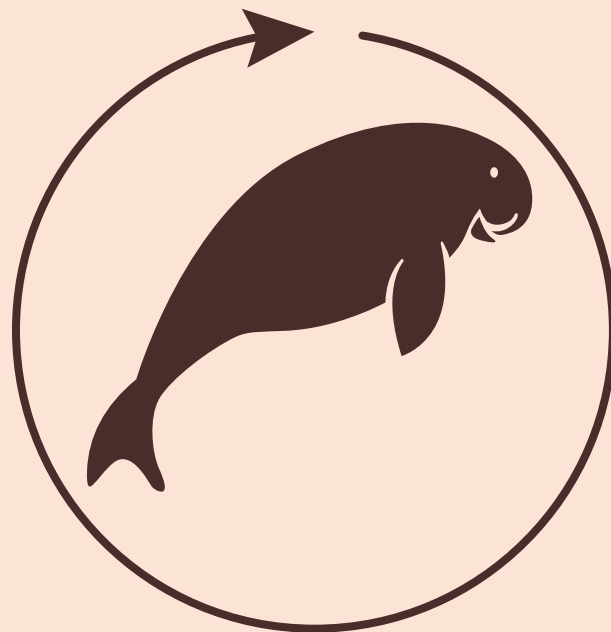
Useful information:

Kidcyber: Dugongs <http://www.kidcyber.com.au/dugong>

YouTube: WWF 7 Facts About Dugongs (1:12mins) <https://www.youtube.com/watch?v=PyDmNXIa8Fo>

Great Barrier Reef Marine Park Authority: Dugong <http://www.gbrmpa.gov.au/the-reef/animals/dugong>

2. Students take their notes and create a poster, PowerPoint or information book using Book Creator App.
3. Students draw the life cycle of the dugong, draw the habitat displaying the living and non-living elements, outline threats to stages of the life cycle and how science is assisting the dugong.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability, critical and creative thinking, ethical understanding and intercultural understanding.

Science:

Living things have life cycles (ACSSU072)

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

Science involves making predictions and describing patterns and relationships (ACSHE050) & (ACSHE061)

Science knowledge helps people to understand the effect of their actions (ACSHE051) & (ACSHE062)

Represent and communicate observations, ideas and findings using formal and informal presentations (AC SIS060) & (AC SIS071)



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SEABIRDS

A MIGRATION JOURNEY



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Activity 1: Changes to seabird habitats

Year level

Year 1

Overview

Students identify how different habitats meet the needs of the seabirds found on the Great Barrier Reef (for example the feeding/breeding grounds as seen in the Bar-tailed godwit from the poster). Predict how this habitat can change and how these changes can affect seabirds.

Outcome

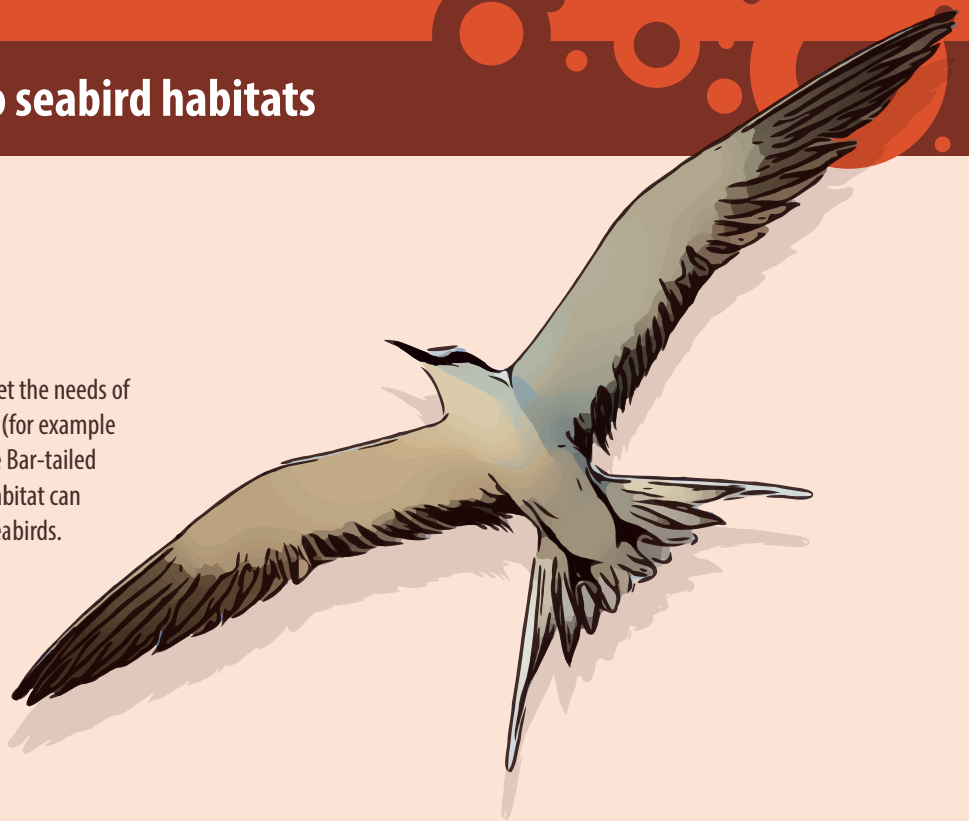
Students learn research skills.

Materials

- Internet access
- Paper or drawing materials

What to do

1. Watch episode of ABC Behind The News: Plastic Oceans (3:43mins) <https://www.abc.net.au/btn/classroom/plastic-oceans/10531814>
2. Show pictures of seabird habitats on the Great Barrier Reef:
<https://tinyurl.com/yd7uvopu> <https://tinyurl.com/ya8v8swb>
<https://tinyurl.com/yao2rzxf> <https://tinyurl.com/yaa2rvc4> <https://tinyurl.com/ycgjf2s4>
Search <http://www.gbrmpa.gov.au/sightings-network/sighting> using "sea birds" as the search string.
3. Do a Think Pair Share for the following questions:
 - How does this habitat meet the needs of seabirds?
 - Predict how this habitat could change (both good and bad changes). Share images of impacts from cyclones and marine debris. Show healthy habitats for seabirds.
http://www.gbrmpa.gov.au/__data/assets/pdf_file/0016/14308/GBRMPA-ExtremeWeatherAndtheGBR-2010-11.pdf
<http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/440/5/Seabirds-shorebirds-GBRWHA-climate-workshop-report.pdf>
 - How do you think this change would affect the seabirds on the Great Barrier Reef?
4. Draw a healthy habitat for seabirds showing examples of shelter, food, sunlight, water and air.



Curriculum links

Cross curriculum priority - sustainability

General Capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking personal

Science:

Living things live in different places where their needs are met (ACSSU211)

Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021) & (ACSHE034)

Pose and respond to questions, and make predictions about familiar objects and events (ACISIS024) & (ACISIS037)

Use a range of methods to sort information, including drawings and provided tables through discussion, compare observations with predictions (ACISIS027) & (ACISIS040)

People use science in their daily lives, including when caring for their environment and living things (ACSHE022) & (ACSHE035)

Activity 2: Protect bird habitats from marine debris in the Great Barrier Reef

Year level

Year 5 and 6

Overview

Students learn about the effects of marine debris on seabirds and build a tool which can be used to remove rubbish from a site, such as a beach, local creek or school ground. The tool could scoop, spike, clamp or be a combination of methods.

Outcome

Students learn to identify key elements of documentaries and to apply that knowledge practically; they learn to apply design of tools to their own project, and construction techniques.

Materials

- Access to the internet
- Materials to make tools with (brooms, netting, scoops such as brush and pan, bats).



What to do

Summarise the importance of human intervention to remove marine debris for birds. Seabirds are more vulnerable to marine debris than any other species on the Great Barrier Reef. The birds cannot remove marine debris on their own, and are in fact defenceless to some such as plastics, netting, oil, foam and other waste. It is up to humans to help.

Request the students design a tool that can be used to remove rubbish from a site. Students will need to consider how the tool will work and which types of rubbish it will remove. Suggested ideas could include a tool which spikes, clamps, scoops, sifts or a combination of these. Consider safety features for people operating the devices and storing when not in use.

1. Investigation

- Watch episode of ABC Catalyst's Plastic Oceans to learn more about the impacts of marine debris on seabirds: <https://www.abc.net.au/catalyst/plastic-oceans/11013966>
- Read about marine debris and its effects on the Great Barrier Reef using Tangaroa Blue's fact sheets: <https://www.tangaroablue.org/resources/education-kit-and-fact-sheets/fact-sheets/>
- Watch Youtube video of students using rubbish removing tools for inspiration: <https://www.youtube.com/watch?v=xncgoPqoYFY>

2. Ideation

- Brainstorm three possible tool designs to remove rubbish. Consider what types of rubbish may be picked up, ease of use and materials which can be repurposed, recycled or reused.

3. Production

- Request students complete a detailed drawing of their design, including different views and at least one close-up of the tool. Label all the different parts of the drawing. Include measurements to show how big the tool will be.
- Develop a detailed production plan to show how the tool will be made. Use photos, words, audio or video to record the steps of the production process and final product.
- Request the students build the design.

4. Test

- Go to a local waterway, park or school grounds and test the tool by picking up rubbish. Keep a tally of the different rubbish types collected and graph the results.

Activity 2: Protect bird habitats from marine debris in the Great Barrier Reef

5. Evaluation

- Complete the below table reflecting on the success of the tool. Consider sharing the tool and results with your school or local council.

	Strengths (What works well?)	Limitations (What does not work well?)	Suggested improvements (How to make it work better?)
Design			
Materials used			
Production steps			

Curriculum links

Cross curriculum priority - sustainability

General Capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking.

Design and technologies:

Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use (ACTDEK023)

Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve

intended designed solutions (ACTDEP024)

Generate, develop and communicate design ideas and processes for audiences using appropriate technical terms and graphical representation techniques (ACTDEP025)

Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions (ACTDEP026)

Negotiate criteria for success that include sustainability to evaluate design ideas, processes and solutions (ACTDEP027)

Develop project plans that include consideration of resources when making designed solutions individually and collaboratively (ACTDEP028)

Information links

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/marine-debris>

<http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3424/8/v0-Position-Statement-Marine-Debris.pdf>

https://www.youtube.com/watch?v=L20N1Y4XcwQ&feature=emb_title



TURTLES

ANCIENT REPTILES OF THE SEA



Australian Government

Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
JUNIOR
OUTLOOK

reef beat

Activity 1: Draw a healthy habitat for the sea turtle

Year level

Year 1

Overview

Students learn features of a hatchling and an adult sea turtle's habitat, look at ways habitats can change both positively and negatively, and draw a healthy habitat for the hatchling and adult sea turtle.

Outcome

Students learn about sea turtle habitats and how to protect them.
Students develop drawing skills.

Materials

- Internet access
- Paper, paints, pencils

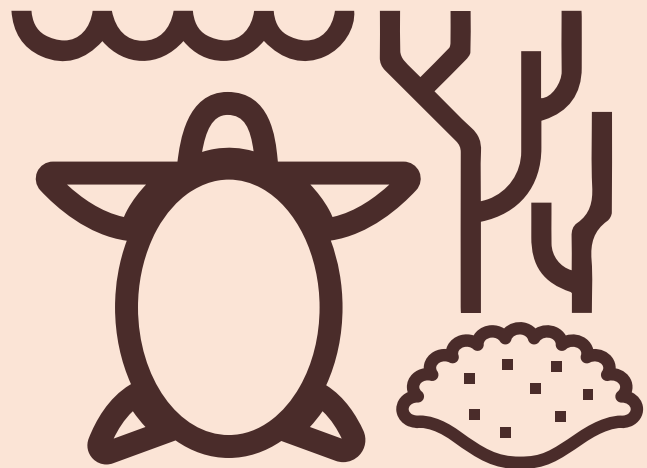
What to do

1. Display photos of sea turtles and their habitat for inspiration.
2. Watch videos: YouTube: Sea turtles <https://www.youtube.com/watch?v=ElffdbFZMPQ>
YouTube: Sea Turtle by The Whizpops <https://www.youtube.com/watch?v=WXe7Rx3w9ro>
ABC: Turtle future <https://www.abc.net.au/btn/classroom/turtle-future/10538956>
3. Read 'The Treacherous Travels of Tasman Turtle' by Simon McLean. Host a class discussion on what a sea turtle needs: sunlight, shelter, food, water and air.
4. Read the fact sheets on turtles in the Great Barrier Reef Marine Park: <http://www.gbrmpa.gov.au/the-reef/animals/marine-turtles>
5. Discuss cyclones, marine debris and dying seagrass and its impacts on turtles, as well as scientists and volunteers helping to keep habitats healthy. Show students examples of positive and negative changes to habitats.
6. Show pictures of healthy sea turtle habitats. Ask students to do a Think Pair Share on the following questions:
 - How does the habitat meet the needs of the sea turtle?
 - How could this habitat change?
 - How do these changes effect the sea turtles?

See image examples © Great Barrier Reef Marine Park Authority



141589 - Green turtle swimming in waters off Lady Elliot Island <https://tinyurl.com/yc2c6xam>
Mandatory credit instructions: Must acknowledge Photographer, Copyright Commonwealth of Australia (GBRMPA) Photographer C. Jones



119826 - Fauna and Flora <https://tinyurl.com/y8s3gcdg>
Mandatory credit instructions: Must acknowledge Photographer, Copyright Commonwealth of Australia (GBRMPA) Photographer S. Whiting

Activity 1: Draw a healthy habitat for the sea turtle



Curriculum links

Cross Curriculum Priority - Sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking personal.

Science:

Living things live in different places where their needs are met (ACSSU211)

Science involves observing, asking questions about, and describing

changes in, objects and events (ACSHE021) & (ACSHE034)

Pose and respond to questions, and make predictions about familiar objects and events (AC SIS024) & (AC SIS037)

Use a range of methods to sort information, including drawings and provided tables through discussion, compare observations with predictions (AC SIS027) & (AC SIS040)

People use science in their daily lives, including when caring for their environment and living things (ACSHE022) & (ACSHE035)

Information Links

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3362>

<http://www.gbrmpa.gov.au/about-us/resources-and-publications/resources-by-theme/marine-debris>

<http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/3424/8/v0-Position-Statement-Marine-Debris.pdf>

Activity 2: Create a poster representing the life cycle of the sea turtle

Year level

Year 2

Overview

Students learn about a sea turtle's life cycle and threats to each life stage. Represent the different life stages using coloured wool creations on a poster.

Outcome

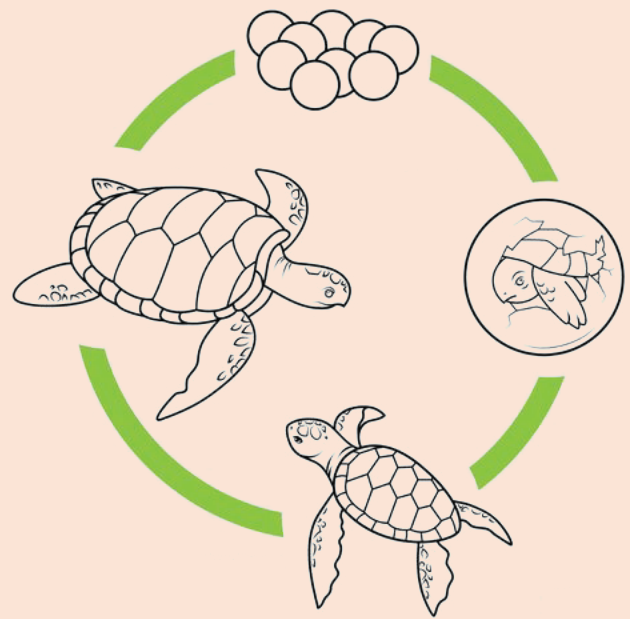
Students gain an understanding of turtle lifecycles and threats to their survival. Students develop their flow chart and representational diagram skills.

Materials

- Coloured wool (green, brown, yellow, white, black and grey)
- A3 piece of paper and craft glue

What to do

1. Display pictures of stages in a sea turtle's life cycle for inspiration.
2. Provide written information on the life cycle from Kids Press Magazine: Life cycle of sea turtles <https://kidspressmagazine.com/science-for-kids/misc/misc/life-cycle-sea-turtles.html>
3. Watch videos for more information: YouTube TED-Ed: The Survival of the Sea Turtle (4:25mins) <https://www.youtube.com/watch?v=t-KmQ6pGxg4>
YouTube: Sea Turtle Documentary (4:30mins) <https://www.youtube.com/watch?v=K-07n8lsRUQ>
YouTube: Sea turtle life cycle animation (4:07mins) <https://www.youtube.com/watch?v=-zsymWRHEKU>
4. Read 'The Treacherous Travels of Tasman Turtle' by Simon McLean.
5. Divide the A3 piece of paper in to quarters and write a life cycle stage heading in each: Egg, Hatchling, Juvenile and Adult. Title the poster Life Cycle of the Sea Turtle.
6. Students roll, twist and wrap wool to represent each of the stages of the life cycle. Based on videos and information sheet, students write down what happens at that stage of the cycle in each section of poster.
7. At the bottom of the page, students write a positive action they can make to assist the survival of the sea turtle.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking.

Information Links

- <https://tinyurl.com/yb23vnqx> (Marine turtles in the Great Barrier Reef World Heritage Area)
- <https://tinyurl.com/y9dpcqay> (Turtles Identification sheet)
- <https://tinyurl.com/ybcdyz54> (Information sheet)
- <https://tinyurl.com/y9sjbapq> (Marine debris position statement)
- <https://tinyurl.com/y83ctbyw> (Marine debris)

Science:

Living things grow, change and have offspring similar to themselves (ACSSU030)

Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021) & (ACSHE034)

People use science in their daily lives, including when caring for their environment and living things (ACSHE022) & (ACSHE035)

Represent and communicate observations and ideas in a variety of ways (AC SIS029) & (AC SIS042)



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WHALES

GENTLE GIANTS OF THE OCEAN



Australian Government
Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

reef beat

Activity 1: Create paper mache whales

Year level

Year 3 and upwards

Overview

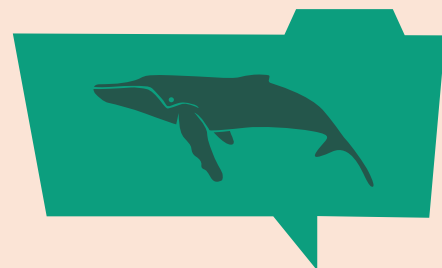
Using templates, create paper mache whales. Once completed, use the Chatterpix® app to make the whale creation talk about threats whales face and positive reef actions (found in the poster and through wider research) we can adopt to minimise the threats.

Outcome

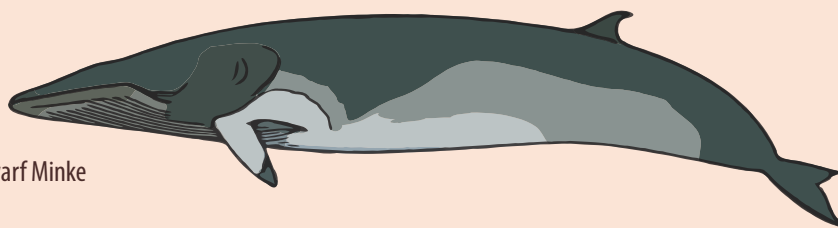
Students understand threats to whale survival, species vulnerability, threat prevention and species protection. Students learn how to make paper mache and apply techniques to creative displays.

Materials

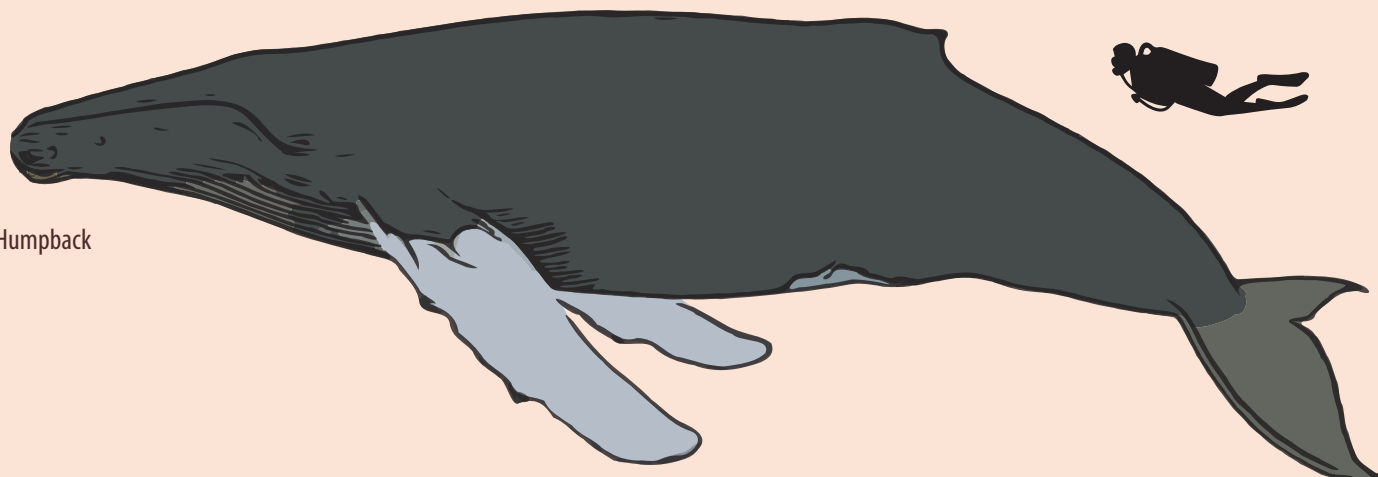
- Access to the internet
- Access to Chatterpix® app <https://apps.apple.com/au/app/chatterpix-kids/id734046126>
- Paper mache materials – paper, glue, paint



Dwarf Minke



Humpback



Activity 1: Create paper mache whales

What to do

1. Provide pictures of humpback whales and dwarf minke whales as inspiration.
2. Print templates of humpback and minke whales on A3 paper.
3. Trace template of choice onto cardboard and cut out. This piece of cardboard becomes the base of the whale.
4. Build up one side of the base plate with rolled up pieces of scrap paper glued to create a 3D effect.
5. Once the desired shape has been made with layers of rolled up paper, cover with strips of paper and paper mache glue. Tip: do final layer with white paper as it is easier to paint.
6. Once glue has dried, paint the whale.
7. To highlight threats to whales and positive actions which can be taken, the whale sculpture can be turned into a mobile with information hanging down on string. Alternatively, take a photo of the whale and use the Chatterpix® app to insert a mouth to record the threats and actions. There is a 30 second time limit for recording.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability, critical and creative thinking and personal and social.

Visual arts:

Explore ideas, experiences, observations and imagination to create visual artworks and design, including considering ideas in artworks by Aboriginal and Torres Strait Islander artists (ACAVAM106)
Explore ideas and artworks from different cultures and times, including artwork by Aboriginal and Torres Strait Islander artists, to use as inspiration for their own representations (ACAVAM110)
Explore ideas and practices used by artists, including practices of Aboriginal and Torres Strait Islander artists,

to represent different views, beliefs and opinions (ACAVAM114)

Use and experiment with different materials, techniques, technologies and processes to make artworks (ACAVAM107)

Use materials, techniques and processes to explore visual conventions when making artworks (ACAVAM111)

Develop and apply techniques and processes when making their artworks (ACAVAM115)

Create and display artworks to communicate ideas to an audience (ACAVAM108)

Present artworks and describe how they have used visual conventions to represent their ideas (ACAVAM112)

Plan the display of artworks to enhance their meaning for an audience (ACAVAM116)

Information links

<http://www.gbrmpa.gov.au/access-and-use/responsible-reef-practices/caring-for-the-reef>

<http://www.gbrmpa.gov.au/the-reef/animals/whales-and-dolphins>

http://www.gbrmpa.gov.au/__data/assets/pdf_file/0015/21732/gbrmpa-VA-DwarfMinkeWhale-11-7-12.pdf

<http://minkewhaleproject.org/>

Activity 2: Life-size representation of humpback whale and exclusion zones

Year level

Year 4 and upwards

Overview

Students use the measurements of the humpback whale to create a life-size representation. Students then mark out the exclusion zones between a vessel and a whale as depicted in the poster.

Outcome

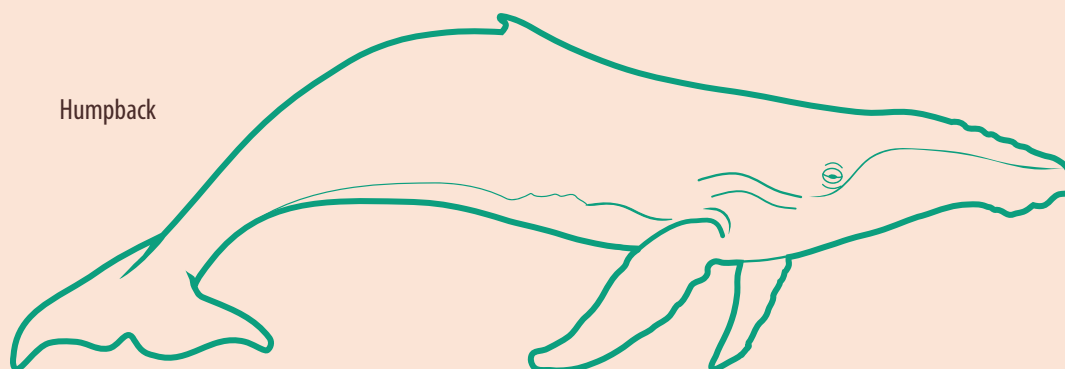
Students understand relative dimensions and how to represent them. Students understand the exclusion zone between vessels and whales so as to not disturb them during migration season. Students understand the large size of humpback whales and the unique challenges they face in the ocean.

Materials

- Access to the internet
- Access to a library for the reading material
- Materials to represent a life-size whale – rope, chalk, markers

What to do

1. View the following video to introduce humpback whales: <https://www.youtube.com/watch?v=CnKgRXGt-S8>
2. Read the fact sheet on humpback whale: <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2868>
3. Introduce the challenge: create a life-size version of the humpback whale. Students use chalk, markers or rope to produce a life size version of the humpback whale. Optional: include an outline of an adult or student for comparison.
4. Read the picture book 'Counting on Frank' by Rod Clements.
5. Provide students with the print-out of the humpback as well with the following measurements:
Length – 15m; Pectoral fin length – 5m; Dorsal fin – set back 10m; Blow hole – 50cm long; Tail width – 5.5m
6. An extra challenge could then convert measurements into centimetres and millimetres.



Curriculum links

General capabilities:

Literacy, numeracy, critical and creative thinking and personal and social.

Mathematics:

Use scaled instruments to measure and compare lengths, masses, capacities and temperatures (ACMMG084)

Solve problems involving the comparison of lengths and areas using appropriate units (ACMMG137)

Information links

<http://www.gbrmpa.gov.au/access-and-use/responsible-reef-practices/caring-for-the-reef>

<http://www.gbrmpa.gov.au/the-reef/animals/whales-and-dolphins>



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SHARKS

WE NEED SHARKS



Australian Government

Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

reef beat

Activity 1: Create a story book on sharks

Year level

Year 3 and upwards

Overview

Students create a picture book modelling the similar writing technique used by Kim Michelle Toft in *'One Less Fish'*. The book depicts the threats sharks face and how we can use positive actions to protect them.

Outcome

Students learn and apply different writing techniques. Students understand the role alpha predators play in our environment. Students can develop presentation and reading aloud skills.

Materials

- Access to library books
- Access to the internet to research sharks
- Access to Book Creator app or paper and colouring pens to make a book

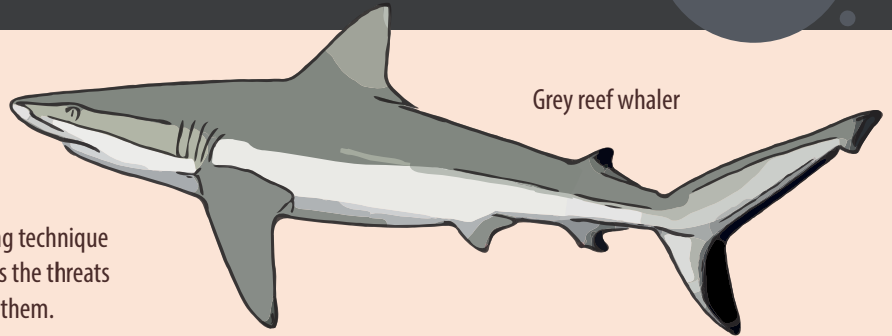
What to do

1. Read *'One Less Fish'* by Kim Michelle Toft. Discuss the rhyming technique and structure of sentences.
2. Introduce students to their challenge: using the same writing technique, make a picture book titled *'One Less Shark'*. For ease of the activity, focus on five shark species.
3. Students research five species of shark found on the Great Barrier Reef using for example Aquaview's 5 Shark Species of the Great Barrier Reef <https://www.leisurepro.com/blog/explore-the-blue/5-shark-species-great-barrier-reef/>
4. Students also need to research threats faced by sharks on the Great Barrier Reef.

The picture book could be published in Book Creator app or as a book.

Extend this activity

Share finished books with prep classes.



Grey reef whaler



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT Capability, critical and creative thinking and personal and social.

English:

Create texts that adapt language features and patterns encountered in literary texts, for example characterisation, rhyme, rhythm, mood, music, sound effects and dialogue (ACELT1791)

Understand that different types of texts have identifiable text structures and language features that help the text serve its purpose (ACELA1463)

Understand how different types of texts vary in use of language choices, depending on their purpose and context (for example, tense and types of sentences) (ACELA1478)

Understand how texts vary in complexity and technicality depending on the approach to the topic, the purpose and the intended audience (ACELA1490)

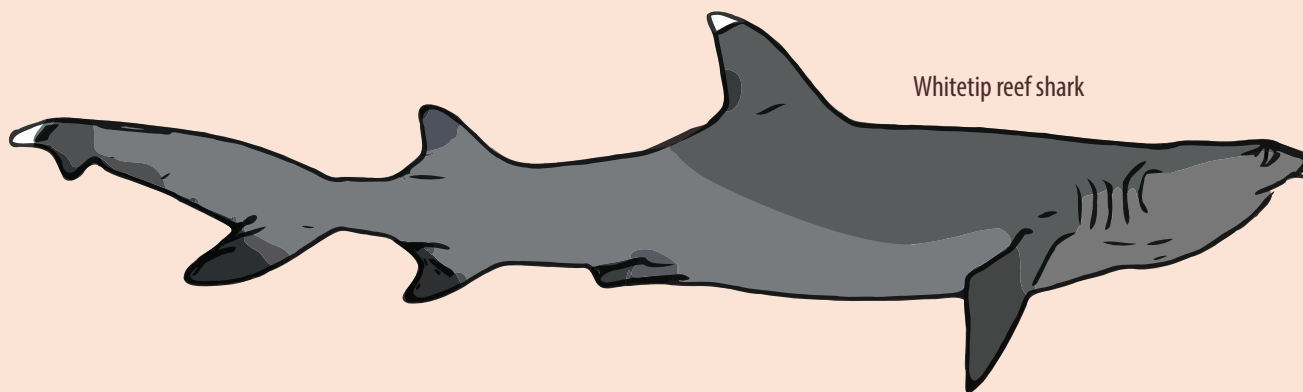
Understand how texts vary in purpose, structure and topic as well as the degree of formality (ACELA1500)

Information links

<https://bit.ly/3apCNkQ>

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/947>

Activity 2: Shark board game



Whitetip reef shark

Year level

Year 3 and upwards

Overview

Design a board game highlighting the threats to the Reef and positive actions which can be taken for sharks on the Great Barrier Reef.

Outcome

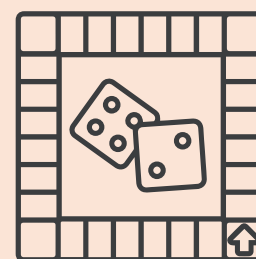
Students learn and apply gaming techniques. Students understand the role alpha predators play in our environment. Students can develop presentation skills.

Materials

- Board games
- Paper, colouring implements, glue, sticky tape, other items required to make a board game

What to do

1. Get students to play with a variety of board games to give inspiration.
2. Students design and build a board game highlighting the problems sharks are facing and what can be done to help them.
3. Have students play other students' games in a round, and provide feedback on each game.



Ornate wobbegong

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability, critical and creative thinking and personal and social.

Information links

<https://bit.ly/3apCNkQ>

<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/947>



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PROTECT YOUR PATCH



Australian Government
Great Barrier Reef
Marine Park Authority

GREAT BARRIER REEF
— JUNIOR —
OUTLOOK

reef beat

Activity 1: Look at ways to CARE, RESPECT, LEARN, ACT and SHARE



Year level

Year 4 and up

Overview

Using the Junior Outlook Reef Beat series and additional links provided below, students research ways to demonstrate how they can care for the Reef, and collaborate with others to refine ideas and implement.

Outcome

Students learn research skills, define activities they can undertake individually to care and protect for the Reef, learn how to communicate and collaborate with peers and the broader community, and offer and receive feedback on their activities.

Materials

- Videos:
 - YouTube: Straw No More | Molly Steer | TEDxJCUCairns <https://www.youtube.com/watch?v=Rr5Py1r9xjw>
 - YouTube: Straw No More - Behind the News <https://www.youtube.com/watch?v=ozaaNbNT1Is>
 - YouTube: 'Journey to the Ocean via Rubbish' by Grace Kim www.take3.org.au
<https://www.youtube.com/watch?v=vh6MDuxYing>
 - YouTube: Reef Funding - Classroom – Behind the News <https://www.abc.net.au/btn/classroom/reef-funding/10526794>
 - YouTube: Threats to the Reef: Marine Debris (4:00) Great Barrier Reef Marine Park Authority
<https://www.youtube.com/watch?v=L20N1Y4XcwQ>
- Materials to write a letter
- Apps such as Voki and My School Avatar to create an avatar of each student
- Materials to make a shopping bag, and possibly sewing machine or glue gun
- Materials to make a compost bin or pile

Activity 1: Look at ways to CARE, RESPECT, LEARN, ACT and SHARE

What to do

Identify five activities that follow the CARE, RESPECT, LEARN, ACT and SHARE theme, for example:

1. Novel Study – ‘*Blueback*’ by Tim Winton. Blueback is a story with an environmental message. Abel and his mother Dora live a simple life at Longboat Bay. Abel helps his mother to make a living from the sea and land. His life changes the day he meets Blueback the fish. This story has an environmental message that we must take an active role in protecting and cherishing what we have. This novel is suitable for Year 4 and upwards. There are many activities and resources available online for this novel.
2. Write a persuasive letter to a politician expressing your opinions on the Great Barrier Reef. Useful website: <https://www.barrierreef.org/>
3. Create an avatar speaking about the issues the Great Barrier Reef faces and how you can take positive action. Suitable apps are *Voki* and *My School Avatar*.
4. Design and make your own shopping bags out of recycled materials.
5. Hold a fundraiser at school for an environmental cause. Have a gold coin donation or even make a calendar of the artwork from the Reef Beat Poster activities and sell to your local community.
6. Develop projects at school:
 - Nude food days
 - Make a worm farm
 - Compost
 - Recycle bottles, batteries and collect soft plastics
 - Energy audits and create energy plans
 - Adopt a local beach or waterway and hold regular clean-ups, planting etc.
 - Connect with your Local Council and see if can help maintain a local habitat.



Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative thinking.

Information Links

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/marine-debris>

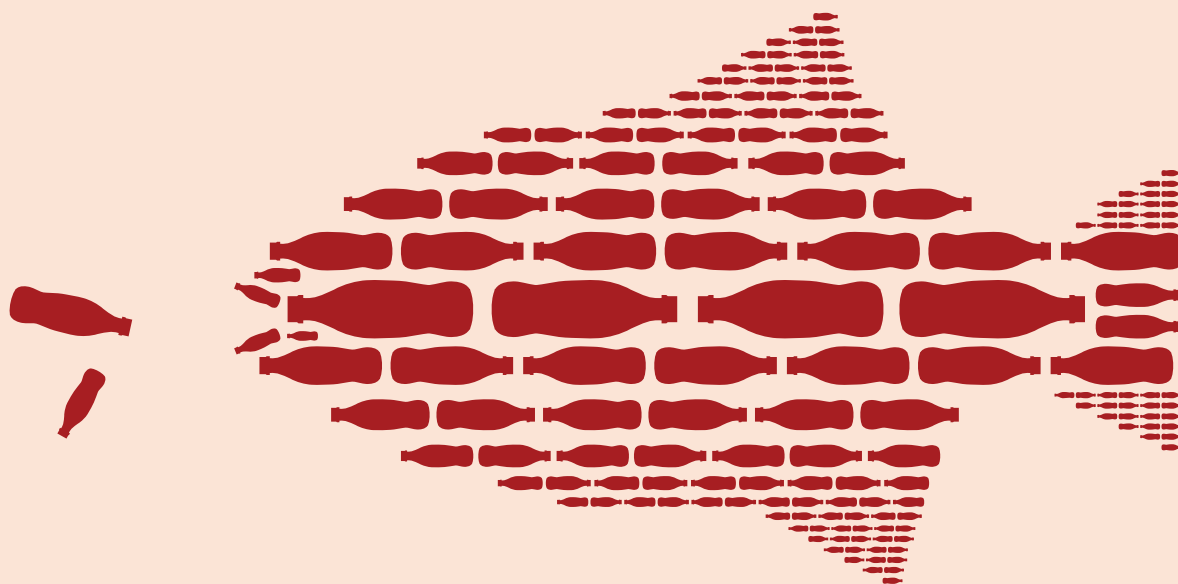
<http://elibrary.gbrmpa.gov.au/jspui/handle/11017/3424>

<http://www.gbrmpa.gov.au/about-us/resources-and-publications/resources-by-theme/marine-debris>

<http://www.gbrmpa.gov.au/news-room/latest-news/latest-news/reef-guardians/2016/yeppoon-says-no-to-marine-debris>

<http://www.gbrmpa.gov.au/news-room/latest-news/latest-news/environmental-impact/2019/dont-let-your-litter-bug-our-reef>

Activity 2: Inquiry Challenge



What is marine debris and how can it be removed safely from the Great Barrier Reef?

Overview

Students are asked key questions about marine debris and then share new knowledge about marine debris with others. They may also design a tool and use it to remove marine debris.

Outcome

Students learn research skills to investigate how marine debris is affecting the Great Barrier Reef, and record their research making notes. Students develop presentation skills by turning their notes into a presentation to share their knowledge with the school and wider community. Students may also develop design skills by producing a machine or tool to remove marine debris from the Great Barrier Reef without impacting its inhabitants.

Materials

- Internet access
- Access to PowerPoint, MovieMaker, Story Book Creator app or similar

What to do

1. Provide students with some key questions to research.

Examples include:

- What is marine debris?
- How does it get there?
- Why is it a problem?
- What is being done to reduce or stop it?



Below are links to useful websites to help with the research. Your local council is also another source of information to find out what is being done in your region to combat marine debris.

The Issue of Marine Debris - Earthwatch Australia – YouTube <https://www.youtube.com/watch?v=Qxo8intDCuY>

Fact Sheets - Marine Debris Fact Sheets – Tangaroa Blue Foundation

<https://www.tangaroablue.org/resources/fact-sheets/category/29-marine-debris-fact-sheets.html>

6 awesome programs tackling ocean plastics – Oceanwatch Australia

<http://www.oceanwatch.org.au/latest-news/blog/5-awesome-programs-tackling-ocean-plastics/>

2. Mind Map - Make notes on the key investigation questions

Q1. What is marine debris?

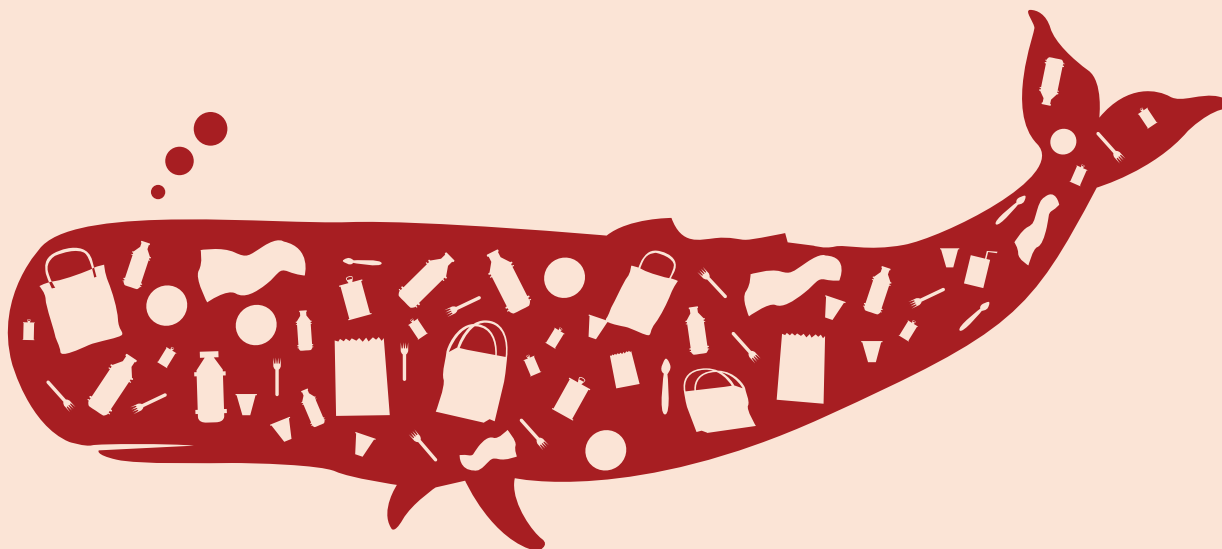
Q2. Why is marine debris a problem?

**What impact is marine debris
having on the Great Barrier Reef?**

Q3. How does marine debris get to the Reef?

Q4. What is being done to reduce marine debris?

Activity 2: Inquiry Challenge



3. **Request students create and present a report using the information they have discovered.**

Invite students to create a report using the information they have gathered. This report can be presented in a variety of ways. Choices include making a video using MovieMaker, PowerPoint or the Storybook creator app.

Encourage students to be creative with how they present the report. A suggestion could be taking the point of view from one of the animals affected by marine debris.

Encourage the students to brainstorm ideas about how they present their reports. Once they decide on a method, and you have approved it, get them started on creating their reports as soon as possible.

4. **Provide a timeframe for completion of the presentation, and suggest ways they can share it.**

Options could include in person in the classroom, at school assembly, via social media (depending on age, but possibly through the school Facebook or website), outside school friends and family.

5. **Set a design challenge.**

Challenge the students to design a machine to remove marine debris from the Great Barrier Reef without hurting corals, fish, dugongs, whales etc.

Ask them to draw their design with labels and include a description of how their machine works. Some students may wish to create their designs – they will need parent or sibling assistance, and time allocated in class, as well as access to some tools (perhaps glue, screws, netting etc.).

Students could then demonstrate their tools either in the classroom or in a real-life situation such as on the beach, in the playground or a nearby park.

Curriculum links

Cross curriculum priority - sustainability

General capabilities:

Literacy, numeracy, information and ICT capability and critical and creative Thinking.

Information Links

<http://www.gbrmpa.gov.au/our-work/threats-to-the-reef/marine-debris>

<https://www.youtube.com/watch?v=UyaGjSMEjsA>

<http://www.gbrmpa.gov.au/our-work/outlook-report-2019>



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www.gbrmpa.gov.au

