


Using children's literature to
teach marine science in schools:
a teacher's guide



*Over & Under
the Waves of*
**THE GREAT
SOUTHERN
REEF**



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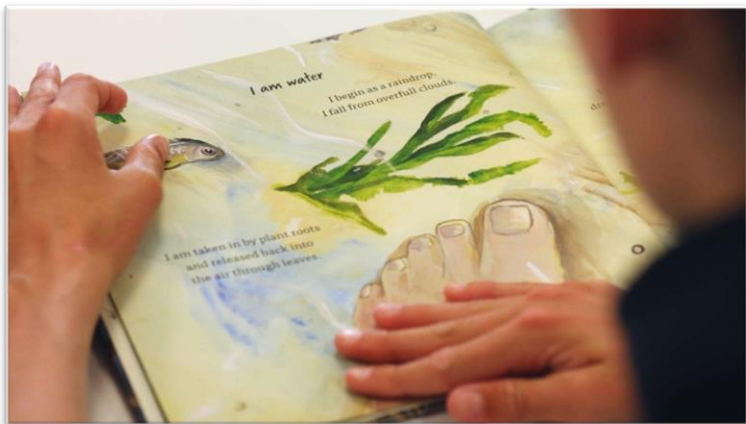


Using children's literature to teach about the Great Southern Reef

A guide for primary school teachers.

2nd Edition

This educational resource was produced by the Deakin Sea.Ed team.



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Through stories we can bring marine science to life and make it more interesting and engaging for future generations. Thank you for helping us change the way young children see and care about the underwater world.



This guide was developed in the scope of a PhD project entitled ***Using children's literature to teach marine science concepts*** conducted by Cátia Freitas at Deakin University, Victoria, under the supervision of Dr Prue Francis, Dr Alecia Bellgrove and Dr Paul Venzo.

The promotion of ocean literacy in schools is the starting point to develop a more ocean literate society. This guide offers educational activities and ideas on how to use children's literature, such as picture books, to promote critical and creative thinking, enhance students' knowledge and connection with the ocean, and inspire stewardship of their local marine environment. This guide is aligned with the recently announced UNESCO Decade of Ocean Science goal: "***By 2030, 70% of formal educators worldwide receive continuous training in Ocean Literacy and pedagogical tools to incorporate Ocean Literacy in the classroom***".

The activities proposed are linked to the following children's picture books about the biodiversity of the temperate marine environment of the southern coast of Australia:

1. ***The Hidden Forest*** by Jeannie Baker (2005)
2. ***The Underwater Forest*** by Rebecca Morris and Matt Howorth (2020)
3. ***The Way of the Weedy Seadragon*** by Anne Morgan and Lois Bury (2021)
4. ***With a Little Kelp from Our Friends*** by Mathew Bate and Liz Rowland (2021)
5. ***Sea Country*** by Aunty Patsy Cameron and by Lisa Kennedy (2021)
6. ***The Great Southern Reef*** by Paul Venzo, Prue Francis, and Cate James (2022)
7. ***Giinagay Gaagal Hello Ocean*** by Melissa Greenwood (2023)
8. ***Secrets of the Saltmarsh*** by Claire Saxby and Alicia Rogerson (2023)

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Ocean Literacy

Ocean literacy was initially defined by Cava et al. (2005) as “an understanding of the ocean’s influence on you and your influence on the ocean”, incorporating seven ocean literacy principles and 44 fundamental concepts.

Ocean Literacy Principles

Principle #1: The Earth has one big ocean with many features.

Principle #2: The ocean and life in the ocean shape the features of Earth.

Principle #3: The ocean is a major influence on weather and climate.

Principle #4: The ocean made the Earth habitable.

Principle #5: The ocean supports a great diversity of life and ecosystems.

Principle #6: The ocean and humans are inextricably interconnected.

Principle #7: The ocean is largely unexplored.

Over the past two decades this concept has evolved and expanded from a knowledge-based model to consider 10 dimensions (McKinley et al. (2023); see full article [here](#)). This shift suggests that becoming ocean literate is a lifelong learning process that ultimately leads to citizens that are actively engaged in marine conservation and sustainable use of the ocean.

Knowledge

Understanding of ocean-related topics and competences in ocean decision-making, engagement, and accessing relevant information.

Trust and Transparency

People’s trust in ocean information sources and their perception of the clarity of information, its platforms and processes.

Adaptive Capacity

Individuals’ ability to adjust and respond to changing circumstances related to the ocean.

Access and Experience

People’s diverse interactions (real or artificial) with the ocean, including challenges to ocean access and experiences.

Emoceans

Individuals’ feelings and emotional reactions towards the ocean and ocean-related issues, which can shape their behaviour.

Awareness

Understanding existing situations or concepts and potential solutions to address ocean issues, fostering ocean stewardship.

Attitudes

Individuals’ alignment with a particular stance, including perceptions, values and opinions on ocean issues, influencing policy and societal change.

Communication

Interpersonal communication, effective access to data about ocean issues and organisational outreach to a wide audience.

Activism

Engagement in activities aimed at driving change, considering the participants in activism and barriers to participation.

Behaviour

Decisions, actions and habits regarding ocean issues to drive systemic change.



How to use this guide

The activities proposed were designed with the purpose of developing students' knowledge about and connection with the Great Southern Reef (GSR). The sequence of activities begins with general topics, that are followed by more specific marine science concepts. The suggested activities are independent from each other. It is recommended that the activities are conducted in the order proposed on the contents table, however teachers may choose to do them in a different order, according to their students' level of knowledge about each topic(s).

All the activities can be conducted in the classroom, except for the field excursion. Different activities are aimed at different grades, from Foundation to Grade 6, but can be adapted to any level.

This guide offers activities that can be conducted before and after reading a story with students, as well as 20 core activities dedicated to a specific concept. Some are stand-alone activities, while others may be combined. Each of the core activities offers background information for teachers; the main objective(s); an explanation on how to conduct the activity; suggestions (for example, how to link one activity to others); the Ocean Literacy principle(s) and dimension(s), and the learning area(s) linked to it. As the Australian curriculum learning areas slightly differ across states, we have combined different learning areas. For the purposes of this guide, The Humanities strand includes The Humanities and Social Sciences, History and Geography. The Arts strand includes Music, Dance, Drama, Media Arts, Visual Arts and Creative Arts.

Several activities include hyperlinks for online available educational resources. These are **highlighted in blue** (as per example) and are clickable in the digital version of this guide.

Additional resources are available on page 56 and a glossary is available on pages 60 and 61. A certificate of completion for students is available on page 58.

Key to symbols:



Represents the suggested reading(s) for each core activity.



Represents the suggested teaching grade(s) for each core activity.



Represents the suggested curriculum area(s) for each core activity.

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- Additional Activities
- Games That Foster Creativity
- Additional Resources
- Certificate of Completion
- Observations Worksheet
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The Great Southern Reef

Australia is an island continent with the third largest marine territory of the world. Approximately 70% of the Australian population live within 50km of the southern coastline, and both benefit from and depend upon the ecological and economic benefits provided by the unique marine ecosystem of the Great Southern Reef. This interconnected shallow temperate rocky reef stretches across 8000km of the southern coastline of Australia, from New South Wales to Kalbarri, in Western Australia. The Great Southern Reef is a temperate marine habitat, which means that the water is a mixture of the cold water from the Southern Ocean basin and warm water from the tropics. It is home to marine species that are found nowhere else on Earth and it benefits people nutritionally, culturally, and ecologically.



Our team produced an article for young minds all about the Great Southern Reef. It's packed with fascinating facts about the GSR and ready to be used in the classroom (grades 3 to 6). Free available to download [here](#):

A Reef Like no Other: The Great Southern Reef

Authors
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Young Reviewers
Bryson Sanket

An illustration of an underwater reef scene. In the foreground, a large orange crab with white spots is on the sandy bottom. To its left is a green sea slug. In the background, a yellowish-orange fish with a long snout and a yellowish fish with a spotted pattern are swimming. The scene is set against a dark blue background with vertical lines representing seaweed or rocks and small blue bubbles.

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Before reading the book

The following ideas can be conducted with your students before the storytelling/book reading begins. This is a way to introduce the topic and prepare for the activities proposed.

Activity: My local beach

Before the reading/storytelling activities start, you may choose to invite your students to share their adventures at their local beach. This is a great way to introduce the topic. Discuss what they may have found on the beach, what marine life they have observed, how they feel when they visit their local marine environment, what their favourite marine animal and/or plant is, which water-based sports they might know, etc. There are many exploratory questions that can be asked to promote a connection with the ocean. This can be achieved through a group discussion, a written sentence/paragraph or even by writing a single word that would describe each category (e.g. on the board, allowing all the students to see each other's contributions).

Children's picture book covers make the first impression on the reader and may reveal a lot about the story inside.

Activity: Book cover jigsaw puzzle

Print a copy of the book cover, cut out puzzle pieces and ask the students to reassemble it. The level of difficulty of this activity will depend on the number of pieces you choose to divide the cover into. This activity might work better if students have not had any previous contact with the book – they will become curious about the story and feel challenged by the cover reconstruction activity.

Activity: The secret clues on the book cover

This activity can be conducted after the previous one, or as a separate activity. Present the book cover to your students. Make sure all students can easily see it (this can be projected onto a wall). Challenge them to come up with ideas of what the book is about. For that, children will have to look for all the clues on the front and back cover of the book. You can suggest a few questions to start the discussion (see examples below) and your students can share their opinions with the class or write their answers on a piece of paper (unidentified) to be discussed later. Collect all student papers, mix them inside a bag, take out a few or all of them, read aloud and discuss.

Exploratory questions:

- Why do you think I chose this book today?
- Who is the book for? What makes you think that?
- [teacher to read the title or ask a student to read it] What do you see? What do you think the book is about?
- Let's have a look at the illustrations. What are the main colours? Why do you think the illustrator chose these colours? What might these colours mean and how do they make you feel?
- What shapes can you see? What might those shapes mean?
- Is there anything unfamiliar on this cover?

[Nodelman & Reimer, 2003; Sipe 2011]

The illustrations

The traditional elements of a picture are colour, line, shape, and texture.

Colour: we tend to associate colours with feelings, sensations, moods. Blue is usually associated with serenity, while black is associated with grief and sadness. Colour has also cultural associations. For instance, in some Asian countries, grief might be represented with white, instead of black.

Line: Fragmented lines are normally associated with uncertainty or instability. On the other hand, solid closed lines appear to be more stable.

Shape: Horizontal shapes can be associated with stability while vertical ones might indicate energy. Pointed shapes can generate anxiety and rounded shapes are mostly linked with softness and safety.

Texture: While it is a challenge to represent texture on paper, it is possible to create an illusion of texture, by combining the elements describe above. The book "*The Hidden Forest*" provides a great example of how we perceive a three-dimensionality on a two-dimensional space.

Reading Aloud and Book Discussion

Activity: The Circle Strategy

Sit students in a circle before the reading aloud commences. The story can be read with a line, sentence, or page at a time, stopping to provide students the opportunity for discussion of the pictures and ideas/concepts that emerge. Page turns in children's picture books build curiosity about what the reader expects to come next. Before the page turn, ask the children in the circle what they think might be on the following page. Ask for volunteers to share their opinions. If no-one volunteers, the teacher can start. Using an object that indicates who's turn it is to talk next can help to conduct this activity to enable each student to take a turn. This is adapted from the technique called "passing the tip" by Donnelly (1994). The tip can be any object in the room and can be passed in any direction of the circle. Every child should be given a chance to speak, and therefore it is important to allow for plenty of time. If students do not wish to talk, then the object should be passed further. When the object comes back to the first person again, the teacher may ask the students that did not participate at first if they would like to do so.

The book(s) can be re-read multiple times. This will allow to build up the knowledge and understanding through discussion. Ask students to think about what they have noticed in each new reading session that they didn't realise before and what they would like to explore in more detail.



Fig. 1: Storytelling session in a classroom.
© CDC, Unsplash

Note: *Discussing incorrect predictions of the story offers a great opportunity for debate and critical thinking. Moreover, while in the circle, it is important to act as a facilitator and equal contributor. You may use the following examples to keep the discussion going: "Interesting. What do others think?" or "Thanks for your contribution – what else can you tell us about this idea?"*

If some children repeat what others said before, then this might be a good opportunity for teachers to explore language articulation. Children can be taught to give a reason why they agree/disagree with their peers.

Activity: Exploring the story

Explore the following questions with your class after reading the story.

- a) **What** is the book about?
- b) **Who** is telling the story?
- c) **Who** are the characters?
- d) **When** does it happen?
- e) **Where** does it happen (new environments/habitats)?
- f) **Why** does it happen?
- g) **How** is the story told?
- h) **What's** the significance of the story?

Note: Write children's contributions. You can choose to write it while they speak (quick notes) or at the end. Be careful not to make it look like you are evaluating everything they say – instead, this should be done to register ideas or topics to explore/discuss later.

Activity: Illustrating the story

Read the story to your students without showing them the illustrations. Page by page, allow them time to visualise the story settings and characters in their minds. Ask them to draw it. Let your students know that there are no right or wrong illustrations. Promote creativity and imagination by encouraging students to represent what they see, smell, hear and feel when listening to the story being told. When the story finishes, invite your students to put together all the illustrations in order and share with the class. Discuss drawings and finally project the book illustrations on a wall, allowing everyone to see it. Compare it with their own visual representations of the story.

Activity: Exploring illustrations

The illustrations are as important as the words in picture books. Allow children to look closely to the pictures in the book and ask them what they see, what is familiar to them and what's new. You may also choose to give students 5 seconds to look at the picture and ask what's the most important feature in the page they just looked at. Repeat this exercise as many times as you wish until enough detail has been collected. Share student's answers and discuss which aspects came up more often. Then, encourage students to think about what the pictures are telling us that is not on the text, and vice versa.

Activity: Matching pictures and words.

Show students the illustrations and the text separately and ask them to recompose the story. This can be done by projecting it on the wall, allowing all the students to have the chance to participate and work together. This activity can be adjusted to different grade levels by only omitting a few words from the text and asking students to put them in the right place.

Another option is to present some of the pictures with "incorrect" text and ask students if the words and the images match and why, or why not. They can also be asked to think about what the "correct" text would be. This activity will promote a more insightful reading and story interpretation.

Activity: The "Wonder Notebooks" Strategy

The "Wonder Notebooks" strategy from Jones & Leahy (2006) encourage teachers and students to wonder about topics related to the book. You can start by giving your students examples of what you wonder (see exemplary practices next page). Then, students can share their wonders with the class, or write them down on paper. You may choose to group the questions into different topics that children can investigate later through a classroom or school project. This will encourage students to practice critical thinking and engage with hands-on activities through planning and conducting experiments and analysing data.

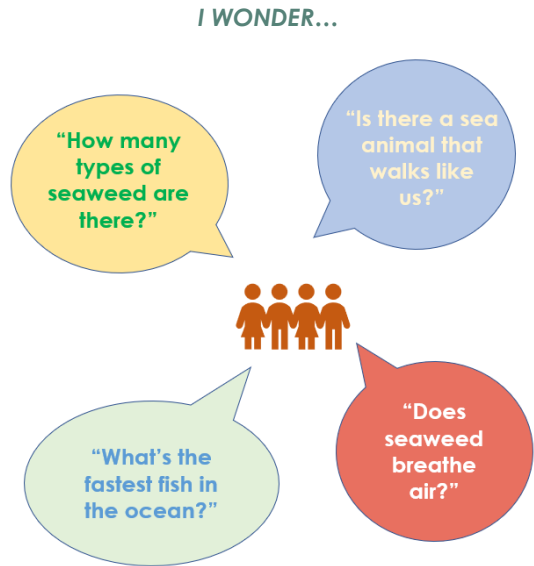


Fig. 2: Wonders from primary school students after reading the picture books "With a Little Kelp From Our Friends" and "The Great Southern Reef".

I WONDER...

Book “The Great Southern Reef”

1. I wonder how big the Great Southern Reef is, what is it made of and what sort of marine life can be found there.
2. I wonder how this reef is connected along 8000km.

Book “Sea Country”

3. I wonder what Sea Country means.
4. I wonder about the First Nations Land on which my school is located.

Book “Giinagay Gaagal Hello Ocean”

5. I wonder which animals I'll encounter when I visit the ocean near my town.
6. I wonder what Totems are.

Book “The Secrets of the Saltmarsh”

7. I wonder where I can find a saltmarsh wetland near me.
8. I wonder which birds live in the saltmarsh, and which ones are visitors.

Book “The Way of the Weedy Seadragon”

9. I wonder if the weedy sea dragon is the only male fish to carry eggs.
10. I wonder what the difference is between seaweeds and seagrasses.

Book “The Underwater Forest”

11. I wonder how old I need to be to scuba dive.
12. I wonder if kelp forests are still in danger in Port Phillip Bay.

Book “With a Little Kelp From Our Friends”

13. I wonder about the origin of these seaweeds how they came to be here.
14. I wonder if people in my local area use seaweed and how.

Book “The Hidden Forest”

15. I wonder how kelp remains upright in the water column.
16. I wonder if these underwater forests are as important for life as the forest on land.

Activity

Where is the Great Southern Reef located?



The Great Southern Reef; Giinagay Gaagal; Sea Country

Objective(s)

Students will investigate and understand the location and extent of the Great Southern Reef. It also provides a context for introducing students to First Nations language and geography.

Students will have the chance to think about and discuss the materials and resources they might need to create the map. In creating the map, children will develop their spatial thinking and understanding of measurements, distances, and directions.

This activity can also be conducted as a school project, where the school community can participate by, for example, painting a large map of the GSR on a school wall, or on the ground.



Method: Challenge your students to create a large map of Australia including a line outlining the Great Southern Reef, to exhibit on the classroom wall, like the one in *The Great Southern Reef* picture book. You may choose to start by presenting the world map showing the different ocean basins (using google maps or google Earth, for example). Find Australia and discuss which ocean basins Australia is surrounded by. Then, using only a map of Australia at a bigger scale, explore with your students, the limits of the Great Southern Reef. Students might need to conduct some research by consulting other books or the internet to find where the Reef starts and ends. Children will need some time to think how they want to do it, how big the map will be, which materials they plan to use and how they will distribute different tasks between them. You may want to allocate a few days (scattered over a couple of weeks) for this activity to be completed.

Suggestion(s): This activity is highly adaptable and there are many alternative ways to conduct it. Making a large-scale map may allow for other activities to be conducted, such as, practising place names, including names of First Nations Land/Sea Countries (see *Giinagay Gaagal* and *Sea Country* picture books). Using stick pins with labels attached to show the distribution of the marine life that can be found along this temperate reef. Try to also include the organisms' scientific names and discuss the need for unambiguous attribution of names for species. Depending on the grade level, the map may include key map terminology and symbols allowing students to comprehend the importance of these items on the map.

Background

The ocean covers approximately 70% of the Earth's surface. There is only one ocean with several ocean basins: North Pacific, South Pacific, North Atlantic, South Atlantic, Indian, Southern, and Arctic."

The Great Southern Reef extends from the Indian Ocean basin in the west, across the Southern Ocean basin in the south and into the South Pacific Ocean basin in the east.

Quick Fact: *The Southern Ocean basin was only named in 2002 – it was the last ocean basin to get an official name.*

The Great Southern Reef is formed by interconnected shallow (<30m) temperate rocky patches that stretch across 8000 km and covers around 71,000 km² of the southern coastline of Australia, from New South Wales to Kalbarri, in Western Australia.

To become a storyteller

Upper grade students can organise and conduct a storytelling activity for lower grades students. This is also an opportunity to invite other classes to participate in the GSR map creation as a school project.

Ocean Literacy Principle(s)

OL1: The Earth has one big ocean with many features.

OL5: The ocean supports a great diversity of life and ecosystems.

Materials

A selection of different materials can be used for this activity, and these will depend on the students' grade level and the scale of the map being created. A few ideas of materials that can be used are:

- Digital technologies (for ideas and map visualisation)
- Paper
- Cardboard
- Colouring pencils/paints (e.g. acrylic)
- Brushes (different sizes)
- Tape measure/rulers
- Scissors
- Wool or string to connect places or add information
- Pins
- Glue



Foundation – Grade 6



- Science
- Mathematics
- The Humanities
- The Arts

Activity

Of what is the Great Southern Reef made?



The Great Southern Reef

Objective(s)

Students will learn that kelp are the foundation species sustaining life in this biodiversity hotspot. Through the pictures and videos, they will get the opportunity to visualise what a seaweed forests looks like underwater.

The Great Southern Reef is defined by a hard bottom covered by kelp forests. Kelps are brown seaweeds found from the shallow coastal waters to depths up to 50m.

Golden kelp (*Ecklonia radiata*) is one of the dominant habitat-forming seaweeds that creates forests along the Great Southern Reef.



Method: Ask students why they think the authors of the book chose to name Frankie and Sam's teacher "Professor Seaweed"? This exploratory question will help start the discussion. Open the book where seaweed is washed up on the beach. Ask them what they imagine seaweed would look like underwater before the storm. Students can just describe it in words or draw it. Start a class brainstorm by questioning if these seaweeds would be floating or attached to something. If attached, what would it be attached to? Sand? Rocks?

Encourage students to share their ideas with the class, before viewing [video 1](#) of shallow golden kelp, [video 2](#) of bull kelp in waves and [video 3](#) of crayweed and bull kelp in the Great Southern Reef. Explain that unlike plants, seaweeds are algae and do not have roots, but have a strong holdfast to attach onto rocks, and obtain their nutrients from the water, not the soil/sand.

Suggestion(s): You may harvest some seaweed washed up on the beach and use for this activity. Check with the relevant authority what is allowed before going foraging. Also, this is a good way to introduce the book "With a Little Kelp From Our Friends" (see book pages 14 and 15).

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 2 – Grade 6



- Science
- The Arts

Activity

Foundation species: fantastic kelp



With a Little Kelp From Our Friends

Objective(s)

Students will gain an understanding of the importance of kelp forests for the local biodiversity.

Kelp grow in cold, nutrient-rich waters and create one of the most productive and dynamic ecosystems on Earth – kelp forests.

Kelp forests are as crucial to the ocean as trees are to the land. Many marine creatures rely on the kelp forests of the Great Southern Reef for habitat, food and shelter.

In addition to the Golden Kelp, other seaweed species also form vast underwater forests along the Great Southern Reef, such as the **Bull Kelp** (*Durvillaea potatorum* and *Durvillaea amatheiae*) and the **Giant Kelp** (*Macrocystis pyrifera*). The Giant Kelp is one of the fastest growing seaweed species on the planet (up to 50cm per day).

Method: Read the first pages of the book (6-9).

Students will learn that the ocean is responsible for roughly 50% of the oxygen produced on Earth. Marine algae (including phytoplankton and seaweed), produce the oxygen that is used by the microbes and animals living there. This is also a great opportunity to teach basic photosynthesis principles.

In addition to oxygen, these underwater forests provide many benefits for the ecosystem and the marine life.

Show your students the [underwater images](#) from the GSR official website and ask them to imagine how these animals would be impacted if the seaweeds were removed from the pictures. They may suggest that marine creatures would not have a place to live, food to eat or spots to hide from predators. Explain that these are some of the reasons why kelp is considered a **foundation species**. Show students the first minute of the following [video](#) published by The GSR official YouTube channel.

Suggestions: This activity serves as an introduction to "The Hidden Forest", a picture book portraying Tasmania's kelp forests through collages of natural and artificial materials, including pressed seaweed.

Ocean Literacy Principle(s)

OL4: The ocean made the Earth habitable.

OL6: The ocean and humans are inextricably interconnected.



Grade 3 – Grade 6



- Science

Activity

How is the Great Southern Reef connected?



The Great Southern Reef

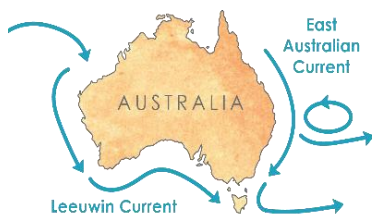
Objective(s)

Students will get an understanding that these currents are crucial for the diversity and connectivity of this reef through the transport of water and organisms.

Two main ocean currents that transport water, nutrients, and organisms, dominate the Great Southern Reef:

The Leeuwin current: flows all the way down the west coast in Western Australia

The East Australian Current: flows from Queensland down to the east coast to Tasmania.



Method: Use the wonder strategy to initiate a class discussion (see wonder #2). Give students a few minutes to think about and share their thoughts on this. Depending on their level of knowledge about the topic, they might suggest that this happens because of the ocean currents, or you might need to drive the discussion by giving them some hints using, for example, the following exploratory questions:

1. Do you think the water moves around the coast or stays always in the same area?
2. If the water moves around the coast, what else can be transported by this movement?
3. How do currents influence climate and weather patterns?

Document student answers and show them a map with the two main currents moving water around the GSR. Watch this [short video](#), or the full 3 episodes of the ABC documentary Australia's Ocean Odyssey: A Journey Down The East Australian Current" [here](#).

Suggestion(s): You may choose to conduct a class experiment to show how water currents move in the ocean (this [video](#) provides a great example on how to conduct it).

Ocean Literacy Principle(s)

- OL1:** The Earth has one big ocean with many features.
- OL3:** The ocean is a major influence on weather and climate.
- OL4:** The ocean made the Earth habitable.



Grade 4 – Grade 6



- Science

Activity

First Nations Peoples connection to Sea Country



Sea Country; Giinagay Gaagal

Objective(s)

Students will learn about First Nations Peoples connection with Sea Country. They will get the opportunity to learn about ways that First Nations communities around the Great Southern Reef connect with their ocean.

The Great Southern Reef has supported First Nations People for tens of thousands of years in the southern coast of Australia.

Many Aboriginal and Torres Strait Islander cultures make no distinction between land and sea and recognise the environment as interconnected. Indigenous Saltwater Peoples have historically and persistently cared for Sea Country and see themselves as part of it. They cherish and maintain a spiritual, cultural, and ancestral bond with coastal land and sea.

Method: Begin by asking students if they have heard about "Sea Country" and what they think it means. Start a class dialogue encouraging students to think about how Sea Country is different from your country. If students are unsure which Indigenous land their school is located on, encourage them to find out together. Read the recommended books and prompt a discussion into First Nations Peoples' connections to the sea and the various ways these connections are portrayed in the stories and illustrations. As a class, get creative and use art to showcase these connections to display on your classroom wall. After conducting these activities, engage students in a reflective exercise to identify what they are curious with respect to local First Nations community's culture and relationship with the ocean. If possible, collect student's questions and get in contact with your local First Nations community to organise a class incursion to provide an authentic and enriching learning experience for all.

Suggestion(s): Use the wonder strategy #6 to initiate a class discussion. Explore the concept of 'Totems' according to First Nations perspectives through the activities freely available on the GSR Foundation website via the '[Educator Hub](#)'.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.

OL6: The ocean and humans are inextricably connected.



Grade 2 – Grade 6



- The Arts
- The Humanities

Activity

How connected are you with the Great Southern Reef?



Any picture book provided

Objective(s)

Students will learn how connected they are with the ocean and how their local marine environment benefits them, their families, their community, and their nation.

Humans are connected with, and dependent on, the ocean. Marine systems provide countless benefits and resources such as oxygen, water, food, medicines, and energy; and play a cultural role supporting recreational activities that improve our wellbeing.

The GSR provides ecological, social, and economic benefits. It contributes \$10 billion a year to the Australian economy. Tens of thousands of people work in industries supported by the GSR such as fisheries, hospitality, and tourism.



Method: Start by asking your students how the characters and/or marine organisms in the books might be connected with, or dependent on, the GSR. If students struggle to start the discussion, help them by giving some suggestions (wellbeing, food, sports, jobs). Following from that discussion, ask them if they benefit from the GSR the same way or in different ways. Encourage them to take this activity home and ask their families, friends, and community (where possible) how they all benefit from the Great Southern Reef. Students can be challenged to get as many connections with the ocean as possible. Let them know they are free to choose how they want to present this work. Encourage them to be creative in how they will represent their connection with the ocean. Some ideas are taking a picture that would represent that connection, drawing it, writing a poem about it, or composing a letter to the ocean. The way they choose to represent connections can be left to their imagination and creativity. Decorate the classroom walls with their work.

Suggestion(s): Wherever feasible, encourage parents/legal guardians to get involved and support their children in this activity.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.

OL6: The ocean and humans are inextricably connected.



Grade 2 -Grade 6



- The Arts
- The Humanities
- Science

Activity

The Great Southern Reef residents



Any of the books provided.

Objective(s)

Students will become familiar with the marine life found in the GSR.

The Great Southern Reef is home to thousands of different species. Yet, scientists estimate that tens of thousands of species are still to be discovered and studied.

Some of the most charismatic species found in the GSR are:

Weedy Seadragon



Australian Sea Lion



Giant Cuttlefish



Moonlighter Fish



Method: Ask students to choose their favourite marine creature from the book(s). If they wish, they can select one that is not in the book(s), but make sure that it is found in the GSR. Challenge them to investigate about that specific animal/plant. Each student will be responsible to create an ID card of their marine creature(s). Show them some examples and let them be creative.

Ideas to include on the ID card:

Photo:	Preferred food:
Common name:	Feeding strategy:
Scientific name:	Predator(s):
Size:	Defences against predators:
Habitat:	Threats:

We recommended creating an example ID card first. This will help students to get a better idea of what is requested from them. Check the "[Marine Life](#)" and the "[Totem Cards](#)" sections on the GSR official website.

Suggestion(s): Use these cards for the excursion to your local beach activity (see page 28). Free images/vectors can also be found on [IAN Symbols library](#).



Grade 4 – Grade 6

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



- Science
- The Arts

Activity

Sizing the Great Southern Reef residents



The Great Southern Reef; Secrets of the Saltmarsh; Sea Country

Objective(s)

Students will explore the relative size of marine organisms, make size comparisons between different species and use measurement tools.

The Great Southern Reef beams with life from all sizes and shapes. Even the tiniest living things can be found in these waters.

Some species of dinoflagellates, a type of marine plankton, are so small that they can only be seen with a microscope. However, some bioluminescent dinoflagellates, aggregated in high concentrations begin to glow when agitated - a spectacular phenomenon that can be seen with a naked eye (Fig. 3).



Fig. 3: Jervis Bay; NSW South Coast
[@Trevor McKinnon, Unsplash](#)

Method: This activity can be conducted with one or more picture books. Challenge your students to think about the size of the marine creatures in the book(s) and ask them to organise the different species from the smallest to the largest. Have students access other resources available (e.g. school library, internet) to investigate the size of marine creatures. Note that the illustrations in the book(s) are not at scale. This is also an opportunity to explore this concept with your class. Later, encourage them to think about, compare and convert the marine creatures' measurements with daily objects that they often make use of (e.g. toothbrush, coin, car, school bus, etc). Children can use a ruler and/or a measuring tape to determine the measurements of a few objects in the classroom. Finish the activity by asking students if the organisms' size matched their expectations. You may choose to create a poster with the marine creatures and the objects next to it. Display it on the classroom wall.

Suggestion(s): For upper grades, you may opt to incorporate this activity into a classroom project. Students, either individually or in groups, may create reports or presentations to showcase their findings. Emphasise the importance of accuracy while also fostering creativity in their work.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 2 - Grade 6



- Mathematics
- The Arts
- Science

Activity

Endemic species of the Great Southern Reef



The Way of the Weedy Seadragon

Objective(s)

Students will learn the concept of endemic species and will become aware of some endemic species in their local marine environment as well as their extinction risk status.

The Great Southern Reef is incredibly biodiverse and a high number of the species residing here are found nowhere else on Earth.

Some species are endemic to the Great Southern Reef such as the:

- Weedy seadragon
- Leafy seadragon
- Spotted handfish
- Harlequin fish
- Southern dumpling squid
- Australian sea lion
- Golden decorator crab
- 613 species of seaweeds (and counting as new species are being discovered and described!)

Method: This activity can be conducted after reading the suggested book or following the activity "The GSR Residents". Start by explaining that species that live only in one geographical region are called **endemic species**. There is the chance that some of the species chosen by the students for the ID cards activity are endemic species of the GSR.

Challenge them to discuss some answers to the following exploratory questions:

- a) Is it important to protect endemic species? Can you think of 3 reasons why?
- b) Do you think that the Weedy seadragon is the only endemic species of the GSR?/ Which of the species in the ID cards/poster are endemic?

Introduce your students to the official website of the [IUCN Red List](#), which provides global data on the extinction risk status of species. Let them explore the status of some of the GSR endemic species.

Suggestion(s): Additionally, you may read "[Hold On! Saving the Spotted Handfish](#)" with the students, for further investigation on endemic species of the GSR.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.

OL6: The ocean and humans are inextricably interconnected.

OL7: The ocean is largely unexplored.



Grade 4 – Grade 6



- Science
- The Humanities
- Technologies

Activity

Creatures under cover



The Way of the Weedy Seadragon; The Hidden Forest; Secrets of the Saltmarsh

Objective(s)

Students will identify a variety of marine creatures that use camouflage as a defence mechanism.

The great diversity of ecosystems found in the GSR allows many organisms to develop adaptations to survive in their habitat. One of these adaptations is the ability to blend in with their surroundings, allowing them to avoid predators and/or to sneak up on prey.

In the Great Southern Reef, some of the marine creatures with this remarkable adaptation are the:

- **Weedy and Leafy seadragons**
- **Pot-bellied seahorse**
- **Giant Australian cuttlefish**
- **Southern dumpling squid**
- **Golden decorator crab**
- **Some species of seastars**

Method: In the "*The Way of the Weedy Seadragon*" book, seadragons are described as the masters of camouflage. Start a discussion with your students about the importance of camouflage. How does this benefit seadragons?

The Weedy seadragon is not the only marine creature in the GSR with great camouflage skills. The books "*The Hidden Forest*" and "*The Secrets of the Saltmarsh*" offer some great examples too. Challenge your students to look carefully at the illustrations and try to find all the animals blended within their marine environment. Invite them to think about answers to the exploratory questions below for the marine creatures in the books.

1. Who might the marine creature(s) be hiding from?
2. Is the creature hiding so their prey gets closer and easier to capture?
3. If it was a competition, which of these animals would win the first prize at disguising? Why?

Suggestion(s): For upper grades, you may also read the book "[The squid, the vibrio and the moon](#)" which provides a great example of a symbiotic relationship that allows the bobtail squid to go undetected and avoid predators.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 2 - Grade 6



- Science

Activity

A spiky problem



The Underwater Forest

Objective(s)

Students will gain an understanding of how high densities of 2 different species of sea urchins can impact kelp forests of the GSR.

The purple sea urchin

Heliocidaris erythrogramma

Purple sea urchins are native to the GSR, however a booming of the urchin populations have been clearing out kelp forests leaving reefs barren.

The long-spined sea urchin

Centrostephanus rodgersii

Climate change is causing the East Australian Current to become stronger, which is sending the warmer water further south, to Tasmania, and the larvae of long spined sea urchins along with it. Combined with the overfishing of rock lobster populations (urchins' natural predators), we are seeing a dramatic decline of Giant Kelp forests (that prefer cold water and cannot reproduce fast enough to combat the urchin grazing), resulting in barren habitats.

Method: Show students the book illustrations below (hide the text as per example).

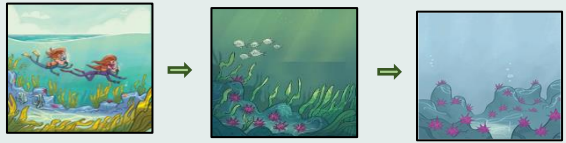


Fig. 4: Illustrations from the book "The Underwater Forest"
© Matt Howorth

Give students time to think what's different and what could have happened from the first scenario to the third. Read the story and use "The Circle Strategy" for discussion. Ask them if they have heard about any other places along the GSR that have been affected by sea urchin outbreaks. Together watch this [video](#). Stop the video strategically at 3:57 minutes. In groups of 5, ask students to imagine that they were hired by the government to find solutions for this problem and allow 15 minutes for group discussion. Have the groups share their ideas with the class and debate them. Watch the video until the end and discuss.

Suggestion(s): Invite the author of the book to visit your school in person (or virtually) and share with the students the progress of the project that aims to restoring the kelp forests in Port Phillip Bay.

Ocean Literacy Principle(s)

OL3: The ocean is a major influence on weather and climate.

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 5 – Grade 6



- Science

Activity

Turning up the heat



The Underwater Forest

Objective(s)

Students will learn that species have specific environmental requirements and that changing crucial habitat factors such as temperature (due to climate change) will lead to a shift in species habitat ranges. This shift is having consequences on populations of kelp forests across the Great Southern Reef.

Some organisms are already being negatively impacted by the changes in water temperatures resultant from human activities.

Currently, the most significant threat upon the Great Southern Reef is climate change. The rising of water temperatures will allow some herbivorous tropical species to migrate down south, quickly grazing on the kelp forests. It is known that 95% of the kelp forests around Tasmania have already completely disappeared.

Method: Following the previous activity, use “The Wonder Strategy” to question what other species might be affected by the increase of the water temperature in the East Australian Current and what might be the consequences of this happening.

Watch the [documentary](#) (episode 2; 09.43 to 16.04 min) where Dr. Adriana Verges explains their research work and talks about the effects of the increasing water temperature of the East Australian Current. Dr. Verges gives some examples of marine life that are being affected by this increase in water temperature. Watch the [documentary](#) (episode 3; 10.20 to 16.57 min).

Challenge your students to write about the similarities and differences between the “The Underwater Forest” book (in Port Phillip Bay, Victoria) and the video (in Shelly Beach, NSW) with respect to reasons leading to the decline of seaweed forests and the restoration strategies being implemented.

Suggestion(s): Read pages 44 to 47 from “With a Little Kelp From Our Friends” picture book before conducting this activity. This will allow students to better understand the rise in ocean water temperature.

Ocean Literacy Principle(s)

OL3: The ocean is a major influence on weather and climate.

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 5 – Grade 6



- Science

Activity

Understanding and exploring tides



The Secrets of the Saltmarsh

Objective(s)

Students will understand how tides work, why is it important to look at the tides before exploring the seashore and determine the time of low and high tides using a tide table.

Tides are a natural process where the water level rises and falls on daily cycles. Tides are caused by the gravitational pull of the sun and the moon. Understanding the tides is important for many reasons such as exploring coastal areas and making use of the resources present along the coast.

Along the GSR coast, there are usually 2 high tides and 2 low tides each day, which is known as semi-diurnal tidal cycle. Each day, it takes over 6 hours between each high and low tide, and approximately 50 minutes for tides to turn.

Method: After reading the book, use the circle strategy to explore the concept of tides with your students. Use the book references to “rising tides” and “falling tides” to begin the discussion. Determine the level of prior knowledge through the following exploratory questions: **(a)** Do you think it’s important to predict tides? Why? **(b)** Are tide times the same everywhere? **(c)** How do tide times differ from day to day?

Print a tide-table for a given time period (e.g. one month) but for different locations (use the tables provided by Bureau of Meteorology [here](#)). Group students in teams of 4 and give them the printed tide tables. Ask them to find how many high and low tides occur in one day, what’s the tidal range and period and predict when would be the best time to go exploring the rock pools in the place that was allocated to them. Compare responses allowing students to understand the difference in tide times for different coastal areas.

Suggestion(s): If you plan to conduct an excursion to your local beach, students can be challenged to choose the best day to visit the beach using the tide table.

Ocean Literacy Principle(s)

OL 2: The ocean and life in the ocean shape the features of Earth.

OL6: The ocean and humans are inextricably interconnected.



Grade 4 – Grade 6



- Mathematics
- Science

Activity

Excursion to my local beach



The Great Southern Reef; Sea Country; Giinagay Gaagal

Invite your students to go on an adventure to your local beach and see what they can find, similar to the activity undertaken by Professor Seaweed and the children, Sam and Frankie, in the book “*The Great Southern Reef*”.

Upper grades (years 4 to 6) will conduct an easy monitoring survey using a method similar to that used by marine scientists, but adapted for primary school students, to investigate the abundance and distribution of marine organisms in the intertidal zone. They can opt to take their ID cards created in the classroom beforehand (see activity page 20) to help identify the marine organisms. Lower grades (Foundation – Year 3) can explore the coastal area to get familiar with the local marine life and play the beach bingo game (see the games section, page 55).

The **intertidal zone** is the coastal area exposed to air during low tide and is usually submerged at high tide.

The intertidal zone is one of the most extreme environments on earth, making it a tough place to live! Daily tidal changes mean species can experience long periods of exposure to air, which drives large changes in temperature and salinity, risk of drying out, limited food availability and a high probability of being eaten by predators such as marine birds. It takes longer for the tide to come back in the upper zone than the low zone, so these environmental stressors increase with height on the shore.

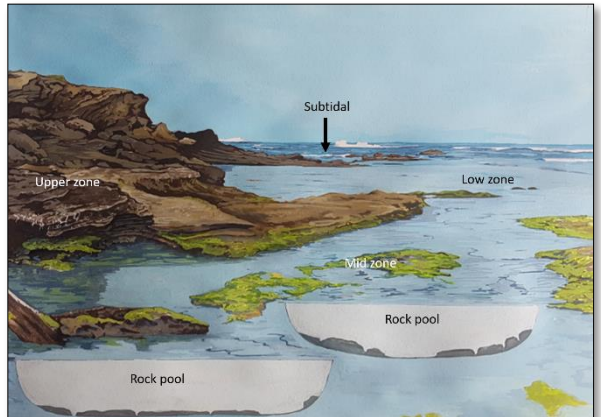


Fig. 5: Intertidal zone
© Megan Nicolson

Objective(s)

Students will gain an understanding that organisms occupy different zones of the intertidal area according to distinct living conditions and will become familiar with organism's ability to adapt and survive in challenging and stressful environments such as rocky shores.

This activity promotes a connection between students and their local marine environment by observing and exploring the marine communities found on local shores.

Students will employ a scientific sampling method to explore community structure, including the distribution and abundance of organisms; look for patterns in the data obtained to test novel predictions (hypotheses); and develop their observation and critical thinking skills.



Ocean Literacy Principle(s)

OL2: The ocean and life in the ocean shape the features of Earth.

OL4: The ocean made the Earth habitable.

OL5: The ocean supports a great diversity of life and ecosystems.

Materials

- Safe and suitable clothing and footwear
 - ❖ Light, breathable clothing
 - ❖ Long pants
 - ❖ Old sneakers, gumboots or reef-walking shoes
 - ❖ Sunscreen
 - ❖ Hat
- Identification guidebooks
- Digital camera
- Notebooks
- ID cards (see page 20)
- Pencils and clipboards
- Bags to collect rubbish
- Gloves
- First-aid kit
- Identification guides available to download from Parks Victoria [here](#) and Friends of the Bluff [here](#).



Fig. 6: Beachcombing
© Nicole Wu



Foundation - Grade 6



- Science
- The Humanities
- The Arts
- Mathematics

Hands-on: Prepare for the field excursion

Teachers: The preparation work suggested below will help you to feel better prepared before taking your students on a field excursion to your local beach. All you need is a digital camera or alternatively you can use the camera on your phone.

Steps:

1. Visit the location chosen for the excursion prior to the fieldtrip to ensure that it is a suitable seashore for students to explore safely. If in doubt, get in contact with the local authorities (e.g. Parks Victoria) and ask for advice.
2. Take as many pictures as you can of the wider intertidal area and the different intertidal zones (upper, mid, and low zone). You can determine these areas roughly, there is not a clear physical separation between them (please see page 27).
3. In each of these different intertidal zones, take pictures of the marine organisms you can find. If you find rockpools, try and take pictures of the organisms inside.
4. For lower grades, these pictures will be used to create a Bingo Game (please see page 55). For upper grades these pictures will be used in the classroom prior to the fieldtrip.
5. Try to identify the organisms distributed in different intertidal zones. For that you can use [the identification guide](#) from Parks Victoria or get in contact with an expert in the field if that is possible. If you cannot identify it, do not worry. This gives you a great opportunity to work with your students in finding more about that specific marine organism together in the classroom.

Safety recommendations: If this is your first time exploring the intertidal area you chose to go to, or you have been here before, but you are not too familiar with the area, we recommend not going on your own. Ask someone to join you. This person can help you with the task in hand, but mostly will be responsible to keep an eye out for any hazards you may find on the intertidal area, and provide help if necessary. Please follow the "**DOs**" and "**DON'Ts**" recommendations on page 43.

Before the field excursion



Acknowledgement of Country

We recommend highlighting the importance of communicating with the Land and Sea Country before exploring the coastal area. Following the example provided in the picture book *Giinagay Gaagal* (activity for all grades; see page 35).

Language

It is important to recognise and respect the connection between language, Country and community. We recommend identifying what language groups exist on the Country you are planning to visit for your excursion. For example, you may contact your local language group through the map available in the [First Languages Australia](#) website.

First Nations Language and Culture Apps may be available for download to your device (e.g. computer, phone). For instance, on Wadawurrung Country, where some of our ocean educators are located, teachers can download the [Wadawurrung Language App](#). This app provides the Wadawurrung names of various marine organisms along with pronunciations guides.

Learn the First Nations name of your local beach

When planning your excursion, consider drawing or printing a map that includes the First Nations name of the beach you will visit with the students. Below are examples of two well-known coastal areas in the Surf Coast, Victoria, known by their First Nations name, Wadawurrung names of local beaches.



Point Impossible and Bells Beach were names given by colonisers.

Kurrak Panyul and Djarrak are the Wadawurrung names for these coastal areas.

Source: Snazzy maps, 2024







Classroom activities

Activity 1: Provide each group of 4-5 students with random pictures you took from your local coastal area (similarly to Fig. 5 on page 27). Discuss with the students the type of seashore that is going to be explored (is it a rocky shore or a sandy shore?) and divide it into zones (upper zone, mid, and low zone of the intertidal area).

Explain that you are organising an excursion to the field and that students will have the opportunity to explore and identify the marine life in their local coastal area. Prompt them to think about what needs to be prepared before the fieldtrip. Students should consider the materials that they will need and guidelines to guarantee their safety while making sure that marine organisms are kept unharmed, and to minimise local disturbance. Ask them to include in their guidelines a list of **DOs** and **DON'Ts** during the field excursion to the seashore. Compare their lists to the one provided in this guide on page 43.

See below some exploratory questions that will help students starting the discussion.

Exploratory questions:

-  What should we consider and be aware of when at the seashore to keep ourselves and others safe?
-  What should we consider in regards to respecting and protecting First Nations Peoples' cultural heritage at the sites we will visit?
-  We need to plan this fieldtrip during low tide. Why is it important that we go to the seashore during low tide for this activity?
-  We need to decide a day and check the time of the low tide. How much time will we have on either side of the peak low tide to conduct this activity?
-  Which animals/plants do you expect to find (or have found before) at the seashore in this area or the area you live in?
-  Why is it important to respect and help protect the marine life while visiting the seashore?

Plants and animals have developed physical and behavioural adaptations allowing them to survive in these extreme environments. Some have hard shells which prevent them from drying out (e.g. limpets), while others restrict their activity by readjusting their metabolism during low tides (e.g. snails and crabs).

Structural, physiological, and behavioural adaptations



Shells



Help to avoid dehydration by retaining moisture and act as a barrier against predators.



Refuge in rocks pools



Provide shelter, food, and stable environmental conditions.



Power in numbers



Reduce exposure to sunlight and prevent water from drying up faster.



Alterations to metabolism





To conserve energy and cope with changes in oxygen availability.

Activity 2: Provide each group of 4-5 students with a selection of pictures that you took from the marine life you found at your local beach. Ask each group to try and identify the marine organism in their pictures (the ID cards can be very helpful for this activity). Depending on the grade level, students might need extra support from books (e.g. "[Field Guide to the Seashores of South-Eastern Australia](#)") and other educational resources.

Make predictions: This is one of the most exciting tasks for students as it will encourage critical thinking and problem solving. After discussing which marine organisms may inhabit different intertidal zones, ask students to think about **3 challenges** that these marine creatures face during low tide. Carefully reading, discussing, and analysing the suggested books will help students to come up with predictions. These predictions are what scientists call hypotheses, which can then be tested in the field. See additional exploratory questions below that might help them to brainstorm some ideas.

Exploratory questions:

 **Where** did you find/expect to find these marine organisms (e.g. on the beach, all in the same area, closest to the water, away from water, in or around rock pools) and **why**? For example, a limpet would most likely be found on rocks in the upper intertidal, an area that is exposed to the sunlight and out of the water for longer periods of time, as their shell protect them from desiccation.

 **How** do small creatures like crabs protect themselves from predators?


 Where do you expect to find more seaweed? Out of the water or in the rock pools? Why?



Fig. 7: Barwon Bluff Marine Sanctuary - Intertidal zone with a few rockpools. © Prue Francis

Note: If you are not sure about some of the organisms you found at the beach, do not exclude them from your picture collection. You and your students can elect to call it a name based on the features of the organism and then try to identify it through species identification guidebooks or asking an expert in the field (e.g. a marine biologist) that you might know or using online resources. For this we recommend using the app [iNaturalist](#).



Safety steps to consider before starting the activities:

- ☺ Make sure that everyone is aware of the safety procedures and where to meet in case of an emergency.
- ☺ Make sure that everyone is wearing suitable clothing and enclosed, non-slip shoes for this activity. Note: shoes that can get wet are usually best, like old sneakers, gumboots or reef-walking shoes, because it means students can move safely over the reef without worrying about getting their shoes wet.
- ☺ Inspect the seashore at arrival and look for any hazardous areas. Make everyone aware of the limits of the area that they can explore and remind them to avoid cliff areas or any zones where the depth of the water is unknown. Students should be buddied up to explore the reef and reminded to stay close and keep an eye on their buddies at all times.
- ☺ Remind everyone that running and jumping should be avoided, and to watch for waves and slippery rocks. A safe distance should be maintained from the edge of the rocks and the water line. We recommend staff and students always face the incoming waves so that they can see if they need to move to higher ground if the tide is rising.
- ☺ Students may find hazardous rubbish (e.g., glass). Make sure they know that it should not be collected and that they should tell their supervisor/teacher.
- ☺ Always keep an eye on the water and timing of the low and high tides.



Fig. 8: Primary school students exploring the intertidal area.

© Cátia Freitas

In the field



Acknowledgement of Country

Before conducting the excursion to your local beach, spend time learning about the First Nations People of your area of the GSR and their connection to Sea Country. Consult with the Traditional Owners to inquire about how they would like to be Acknowledged. Once you arrive at your local beach, gather students in a circle and let them know about the First Nations Land on which you are standing. Explain to them how the local First Nations groups are connected to Sea Country and the concept of Acknowledgement.

Prompt them to think about the picture book "Giinagay Gaagal". The text tells us: **"before walking on Country, we talk to the land and let her know that we are here to play. We are grateful for what she has to offer, we promise to take care of her during our stay."**

All together you can say "Hello Ocean"

Acknowledging Country represents a way of honouring and showing respect to the Traditional Owners of the Land and Sea where an event or a meeting takes place. It also acknowledges the continuing connection that First Nations Peoples maintain with their Country.

Saying goodbye 🖐️

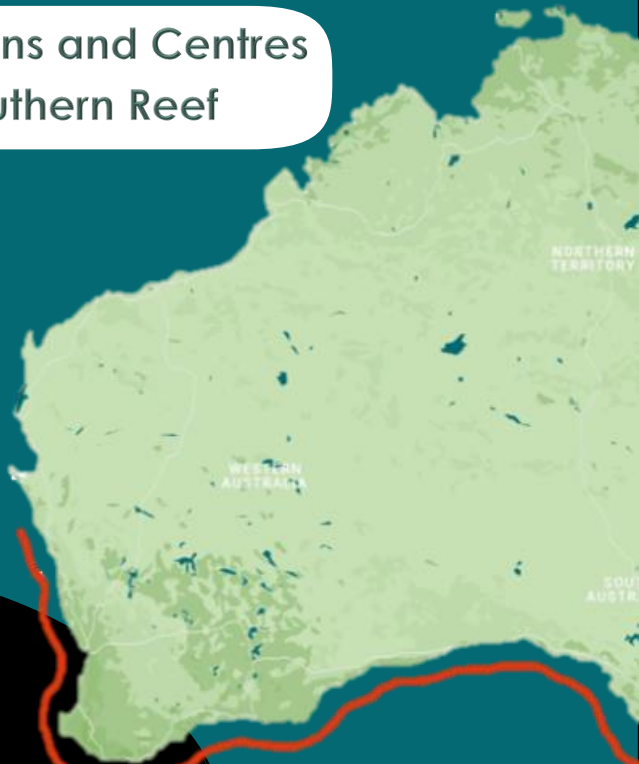
Let students know that it is time to head back to the classroom and as a group thank the Land and Sea for allowing you to visit and wave goodbye to ocean.

Community involvement 👥

If there is the opportunity, consider connecting with the local Traditional Owners Corporation and invite their participation in the Acknowledgement to Country and the fieldtrip. We recommend educators consult the [AIATSIS map of Indigenous Australia](#) that represents the diverse language, social or nation groups of First Nations Australia and [provides guidance on identifying the Traditional Owners of a particular area](#).

Please see pages 36 and 37 for a non-exhaustive list of Aboriginal Corporations and Centres along the GSR (coastal areas; June 2024). In the digital version of this guide, click on the Corporation's name on the map to be directed to its website or a website containing the Corporations' contact details.

Aboriginal Corporations and Centres along the Great Southern Reef



Western Australia

Yamatji Marlpa Aboriginal Corporation
Yued Aboriginal Corporation
Gnaala Karla Booja Aboriginal Corporation
Karri Karrak Aboriginal Corporation
Wagyl Kaip Southern Noongar Aboriginal Corporation
Whadjuk Aboriginal Corporation
Esperance Tjaltjraak Native Title Aboriginal Corporation
Mirning Traditional Lands Aboriginal Corporation

South Australia

Wirangu Aboriginal Corporation
Nauo Aboriginal Corporation
Bamgarla Determination Aboriginal Corporation
Nukunu Wapma Thura (Aboriginal Corporation)
Narungga Nation Aboriginal Corporation
Kaurna Yerta Aboriginal Corporation
Ngarrindjeri Aboriginal Corporation

We have made every effort to ensure the accuracy and representation of information. Please note that this compilation is not exhaustive, and we are regularly updating this resource. Please feel free to contact us with any updates or corrections.



New South Wales

New South Wales Aboriginal Land Council
Tharawal Aboriginal Corporation
Worimi Local Aboriginal Land Council
Dunghutti Elders Council
Gumbaynggirr Jagun Aboriginal Corporation

Victoria

Gunditj Mirring Traditional Owners Aboriginal Corporation
Eastern Maar Aboriginal Corporation
Wadawurrung Traditional Owners Aboriginal Corporation
Bunurong Land Council Aboriginal Corporation
Gunaikurnai Land and Waters Aboriginal Corporation

Tasmania

Tasmanian Aboriginal Centre
South East Tasmanian Aboriginal Corporation
Circular Head Aboriginal Corporation
melythina tiakana warrana Aboriginal Corporation
Flinders Island Aboriginal Association Inc.
Weetapoona Aboriginal Corporation
Six rivers Aboriginal Corporation
Parrdarrama Pungenna Aboriginal Corporation

Tasks: Let students explore the environment before starting the survey. Form groups of 5 and each group should determine who is responsible for **(1)** making sure group members are following the safety guidelines, **(2)** taking pictures, **(3)** recording the physical features of the place being investigated, **(4)** using the identification guides/ID cards, **(5)** recording data. These roles can change between different members of the group.

How to collect data: Each group should randomly choose a location to explore (make sure children do not get too close to the water and always face the incoming waves). Imagine a line that is perpendicular to the water line along the intertidal zone. Once the area is selected, students randomly choose at least 3 different locations along each of the intertidal zones (upper, mid and low) to record the number and the type of organisms they can see in their worksheet, as shown in the picture below (Fig. 9). Create your own worksheets or print the ones on page 59 for students. If the tide is still receding, they can start by looking at the marine organisms in the high zone and move lower on the shore as the tide recedes. Teachers can support students by taking pictures without getting too close or disturbing the organism, for later identification in the classroom).



Fig. 9: Primary schools students sampling the biodiversity found in the mid zone of the intertidal area.
© Prue Francis

If there is a bit of time left, students and teachers can spend the last few minutes to help clean up the beach together!

Beach Clean Up

Tell students it is time to give back to nature by help to clean your local beach to keep the marine life safe from rubbish.

Provide students with equipment to collect rubbish, such as buckets, bags, and gloves. Define an area where everyone can wander around collecting any rubbish they can see if it is not broken glass or any sharp items.



Give them a maximum amount of time they can take to conduct this activity.

For upper grades, teachers can choose to collect data about the rubbish found, for a classroom activity, by following the steps below:

1. Sort the rubbish found in categories: glass, plastic, clothes, wood, paper, metal, rubber, ceramic, sanitary, cigarette butts, others.
2. Count and record how many different items were collected per category (write it down on paper).
3. Back in the classroom, explore together with the students the data collected from this activity. Look at which items were more commonly found and conduct some research about how these can impact the marine life.
4. Lastly, prompt students to look up what is already being done to solve the marine pollution problem.

Become a Citizen Scientist

The marine debris data collected by your class can contribute to enhancing the Australian Marine Debris Initiative (AMDI) Database. AMDI offers datasheets designed for fieldwork, along with educational materials tailored to various grade levels, making it a valuable educational resource. Find out more [here](#).

Back in the classroom



Ask students to imagine they were asked to share the fascinating data they've gathered on the distribution and abundances of marine organisms in the intertidal zones with the other teachers and students in their school. How would they choose to do that?

Organise data: Discuss the best way for students to summarise the data they have collected to show the patterns and to be able to test the predictions they made previously. It might help to starting by classifying the organisms found in different groups. Depending on the age level of your students, this classification can be done by looking at different sizes, shapes, colours (e.g. works very well with seaweed) and their feeding habits (for example, identify organisms based on primary producers, grazers, filter feeders, predators, and scavengers). Encourage students to create their own table, similar to the example provided below, and explore the organisms found across different intertidal zones. Prompt them to think about whether the patterns in their data support their initial predictions/hypotheses.



Example of how students can opt for organising and representing their data. These images were freely downloaded from [IAN Symbols library](#), but students can opt to draw the marine organisms or use pictures that were taken during the fieldtrip.

Interpreting the data: Ask students to look at all the information they have collected. Then start a class discussion about the reasons why some animals and/or plants were distributed in different zones of the seashore (e.g. closer to the water, exposed to the sunlight, in the rockpools). Students should be invited to brainstorm ideas to explain the results they obtained. Teachers might choose to focus only on a few different animals found or different seaweed/seagrasses. See additional exploratory questions below that might help the class discussions.

Exploratory questions:



Are the organisms found during the fieldtrip the same ones represented in the picture books?



How many different species were found in this excursion?



What was the marine organism with the highest abundance found? And the least?



Which organisms were only found underwater? Do you think there's a reason for that?



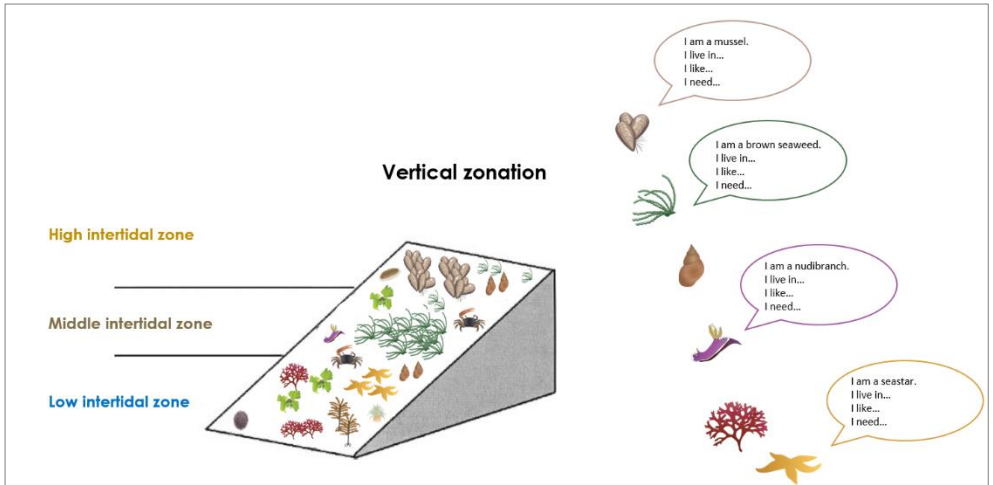
Of the organisms that were found exposed to the air, what might change for them when they are submerged during high tide? How might they possibly adapt to these two different conditions?



Why do organisms living in the intertidal area have to be better adapted to changes in temperatures compared to organisms living continuously submerged in the ocean?

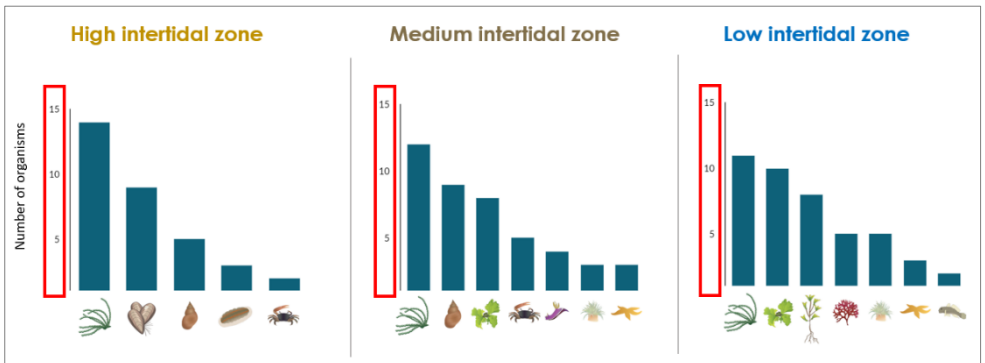
Suggest explanations: have students explore the adaptations (might be structural, behavioural, or physiological) allowing these organisms to survive in the rocky shore. Students might need access to their school library and a computer to conduct research.

Communicate results to others: the last step for any scientist is to communicate your results. A class report or poster with the main findings can be created, printed, and displayed on a school wall where the school community can see it; or even published in the school newsletter for parents/guardians and siblings who may not easily be able to make it to the classroom to enjoy. Results must be presented clearly but not with too much information. Look at the examples below. Pictures/illustrations can help to deliver the message.



Example 1 of representation of results obtained from the field excursion.

Simple bar or pie charts can be used by upper grade students.



Example 2 of representation of results obtained from the field excursion.

DOs

- 👉 Acknowledge, respect and protect the Aboriginal Country on which you visit, and the long and continuous cultural heritage and connection to Land and Sea of Saltwater Peoples of Australia.
- 👉 Respect the natural environment.
- 👉 Tread cautiously to avoid slipping.
- 👉 Keep an eye on the waves at all times to ensure your safety and that of your buddies.
- 👉 Avoid disturbing the marine life, always observe it with a safe distance.
- 👉 Listen carefully to any instructions about poisonous organisms in your region to avoid possible injury.
- 👉 Take pictures and make sure marine life is left where found.
- 👉 If turning seaweeds and/or rocks, make sure to return them to their original position to protect them from environmental stressors.
- 👉 Avoid bird nesting areas (look for signs placed on the beach during nesting season and carefully read the guidelines).
- 👉 Let your teacher know about anything washed up on the beach that doesn't belong there.
- 👉 If collecting seaweed samples, make sure your teachers hold the necessary permits from the local authorities.

DON'Ts

- 👉 Don't explore the seashore on your own.
- 👉 Don't disturb birds feeding.
- 👉 Don't leave any rubbish behind – always bag it and take it back with you.
- 👉 Don't get close to the water line and never turn your back to the ocean.
- 👉 Avoid collecting shells from rocky shores as these can be home for some marine animals (but it's usually ok to collect a few shells from sandy beaches as long as you're not in a protected area).
- 👉 The rockpools are home for some venomous animals such as the blue ringed octopus or other marine life that may harm you. Never place your hands where you can't see them (e.g., hidden holes, under ledges).

Activity

Birds of the marsh



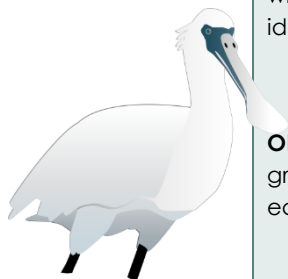
Secrets of the Saltmarsh

Objective(s):

Students will learn what saltmarshes are and why this is an ecological important area for resident and migratory birds.

Saltmarshes are coastal ecosystems that provide numerous benefits such as shelter, food, and nursery grounds for many species, absorb carbon, helping to mitigate climate change, and protect our coasts by reducing the impacts of storms, waves, and tides.

During summer, many bird species migrate to saltmarshes as these areas offer food, shelter, and a place to reproduce. Meanwhile, charismatic residents like Spoonbills and Egrets call these marshes home year-round.



Method: Ask students if they have ever visited a saltmarsh before. Search where the closest saltmarsh area to your school is and show it to students on a map (this can be projected onto a wall).

Let students know that you've noticed that in this picture book there are many different birds. Ask them if they have seen any of these birds. Go to the page where there are summer visitors and the birds that are residents of the marsh. Challenge students to think about what the narrator means with "summer visitors". Where do these birds go during winter? Why do they return for the summer? After exploring the concept of migration and the reason why these birds migrate, let them choose one of the birds in the book and ask them to conduct research on where these birds come from, how many kilometres they travel, and how long they stay and if they come back every year. Challenge them to think about the adaptations that help them to cover such vast distances. Create a class map for their migrations for a visual understanding.

Suggestion(s): If possible, take your students on an excursion to the saltmarsh to do some birdwatching. If available, take with you field guides for birds' identification and binoculars.

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 3 – Grade 6



- Science
- English
- The Humanities

Activity

Seagrass habitats of the Great Southern Reef



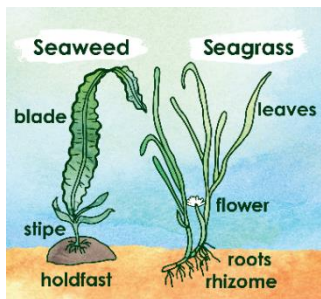
The Way of the Weedy Seadragon

Objective(s)

Students will learn about the differences between seaweeds and seagrasses as well as the benefits that seagrass meadows provide to the ecosystem.

A large number of species found in the GSR make use of the rocky reef habitats, but the nearby sandy-bottomed areas covered with seagrass meadows are also popular. Apart from all the benefits provided by these highly productive marine ecosystems, seagrass habitats also establish connectivity between reefs.

Seagrass meadows provide important and productive nursery areas for commercial and recreationally important species present in the GSR.



Method: After reading the book, use the wonder strategy to introduce a discussion about seagrasses (see wonder #10). Prior to the activity, collect samples of seaweed and seagrass from your local beach (check with the relevant authority what is allowed before going foraging, and always try to minimise your impact). Display samples in large trays and encourage students to handle them and describe the differences between seagrasses and seaweeds. They might mention the presence of roots, leaves and rhizomes in the seagrass samples and the absence of the same structures on the seaweeds. They may also start noticing that seagrasses have similar structures to land plants. Try to lead them to understand that seagrasses are flowering plants that have adapted to live in the ocean. Invite students to think about at least 3 reasons why seagrasses are an important habitat for the Weedy Seadragon (e.g. provision of food, protection, and oxygen). Share with the class the videos ([V1](#), [V2](#), [V3](#)) published by the official GSR Facebook account about the seagrass ecosystems on the GSR.

Suggestion: For upper grades, challenge students to draw a labelled representation of seaweeds and seagrasses as per the example on this page. More background information about seagrasses can be found [here](#).

Ocean Literacy Principle(s)

OL5: The ocean supports a great diversity of life and ecosystems.



Grade 4 – Grade 6



- Science

Activity

The Great Southern Reef as inspiration



Any picture book provided.

Objective(s)

Students will be introduced to a few artists that use the marine life and habitats of the GSR as an inspiration for their artwork.

Art and Science go hand in hand in understanding the natural world around us.

The unique marine habitats along the GSR inspire people to create remarkable artwork all over the world. These artists share their passion with others through paintings, photography, videos, stories, etc. Art can drive people's attention to this visually stunning natural reef and help them to connect and expand their understanding and appreciation of it.

"A good scientist can be a great artist just in the way that they do their work, and a great artist can be scientific in his exploration of his subject."

[Roger Swainston](#)

Method: Starting with all the authors and illustrators from the picture books to other artists who are inspired by the unique marine life found in the Great Southern Reef (see list below), there are many people working to raise awareness of the GSR through their artwork.

Explore the artwork with your students and ask them which questions they would like to ask to the different artists. Write them down and then organise the class in groups. Each group should draft an email to the artist that they would like to invite to visit (in person or virtually). Alternatively, the class can write an email together. Once the final version of the email is finalised, the teacher can send it to the artist(s). Schedule a day and time for the visit and make sure to have all the questions ready.

Students can be encouraged to create their own artwork based on their favourite artist(s). This can be linked to the activity in the next page.

Artists

- . [Stefan Andrews](#)
- . [Casa Adams Fine Wares](#)
- . [Angela Rossen](#)
- . [Narelle Craven](#)
- . [Matt Testoni](#)
- . [Miimi and Jiinda](#)

Ocean Literacy Principle(s)

OL6: The ocean and humans are inextricably interconnected.



Grade 2 – Grade 6



- The Arts
- Science

Activity

Raising awareness of my local beach



Any picture book provided.

Objective(s)

Teachers and students will help to raise awareness about the GSR through a school art exhibition/fair.

It is estimated that 16 million Australians live within 50km of the Great Southern Reef.

Some say that the GSR is Australia's best-kept secret. People depend upon the ecological and economic benefits provided by this temperate marine ecosystem. However, it is still relatively unknown within the community.

"With knowing comes caring, and with caring, there is real hope that the Great Southern Reef will be respected and protected."

Sylvia Earle

Method: Creating a local marine environment art exhibition can be a very engaging activity for your students and gives other students, teachers and the staff members from your school an opportunity to engage with your local marine environment. There is a great deal of material that can be used to create an art exhibition of your local marine environment/beach. You may like to organise a beach clean-up, where rubbish found can be used to create representations of the local marine environment. This activity can be completed over a few months or a school year project.

Alternatively, if an excursion to the local beach is not possible, students can collect old/recycled materials in boxes placed at the school for everyone that wishes to contribute. This way the whole school community can be involved. Parents might help children with resource collection for the art exhibition. Get some inspiration [here](#).

Suggestion(s): Additionally, you can create a class newsletter and students can be invited to write an article per month. Topics could include marine species they learned about, interviews to experts in the field, etc.

Ocean Literacy Principle(s)

OL6: The ocean and humans are inextricably interconnected.



Foundation

Grade 6



- The Arts
- Science
- English

Activity

Ask an expert



Any of the books provided.

Objective(s)

Students will be able to clarify their questions and curiosities about the GSR by inviting experts in the field to their classrooms.

The natural system of the GSR was first named in 2016. Later, in 2019, it was nominated a [Mission Blue's Hope Spot](#) in recognition of its pristine temperate reefs, biodiversity, Indigenous values and importance.

The GSR remains largely unexplored. The next generation of scientists will have the opportunity to make great discoveries, as it is estimated that tens of thousands of species are yet to be discovered.



Method: After reading and discussing a book, ask your students if they have any questions. These might be related to the story, the characters, the habitat, or simply to discuss ideas of experiments/projects. Depending on the book and the marine science field, invite a relevant speaker to your school. Students can investigate who they would like to invite. These speakers can be fishermen, marine scientists and educators, citizen scientists or anyone that has some level of knowledge about the GSR and would be able and available to share their knowledge with students, answer their questions about a specific topic and support the projects happening at a school level.

If the speaker that was selected cannot attend the school in person, with your support, ask students to organise a virtual meeting.

Suggestion(s): Whenever possible, conduct an excursion to formal or informal marine science education providers (e.g. Discovery Centres, Universities, etc).

Ocean Literacy Principle(s)

OL6: The ocean and humans are inextricably interconnected.

OL7: The ocean is largely unexplored.



Foundation
–
Grade 6



- Science
- English

Activity

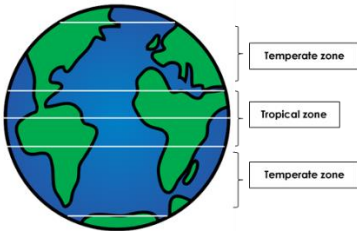
Temperate vs Tropical marine ecosystems

Temperate and tropical marine ecosystems share a few similarities and several key differences.

Objective(s)

Students will learn about the main differences between tropical and temperate marine habitats.

Different locations



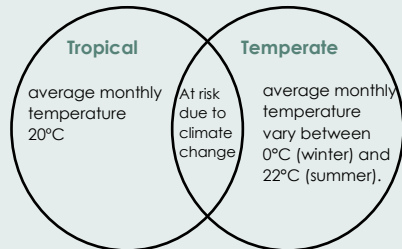
© Dieter Tracey, IAN Symbols

Different habitat-forming species

Tropical: coral reefs formed in shallow, warm, nutrient-poor waters such as the Great Barrier Reef.

Temperate: kelp forests formed in shallow, cold, nutrient-rich waters such as the Great Southern Reef.

We recommend you conduct this activity after your students have an adequate level of knowledge about the marine life and habitats of the Great Southern Reef. Watch the episode "[Pacific Ocean](#)" from the "Magical Land of Oz" documentary. Ask them to think about the main differences between the Great Southern Reef and the Great Barrier Reef in terms of location, temperature, marine life, and threats. This activity can be conducted in teams of 2 or 4 students with each team completing a Venn diagram (example included below). Compare and discuss student's contributions.



Suggestion(s): Read the book "*The Great Barrier Thief*" by Sue Pillans before conducting the activity. This will help students to visualise and understand the differences in marine life inhabiting these two reefs.

Ocean Literacy Principle(s)

- OL1:** The Earth has one big ocean with many features.
- OL2:** The ocean and life in the ocean shape the features of Earth.
- OL3:** The ocean is a major influence on weather and climate.
- OL5:** The ocean supports a great diversity of life and ecosystems.



Grade 5 – Grade 6



- Science

Additional activities

Activity: Reflection of the book

Invite students to reflect about the following questions:

1. What did you like the most about this book? Why?
2. What did you not like so much/at all? Why?
3. Was there something that intrigued you?
4. Would you recommend this book to someone? If yes, describe who that person would be and why.

Activity: “Dear author”

This activity involves writing a letter to the book's author(s) and/or illustrator(s). This can be completed in groups or individually. After reading the book, students write to the author via the publisher (who forwards the messages). The letters can include questions to the author about the writing process, the book, the story, the illustrations, and what would have happened if something in the story was different, for example. Students should also be encouraged to give the author/illustrator positive feedback on what they liked about the book and why. Encourage discussion about the best way to structure the letter, e.g. should they start with positive feedback or questions etc., or perhaps an introduction to themselves and their passions relevant to the book? It might take some time until your students get an answer from the author/illustrator(s), but this should not discourage you from conducting the activity. Receiving a reply letter from the author will help your students become more engaged with the book and the topics being discussed.

Activity: “Interview with the story characters”

Ask your students to choose a marine organism from the book(s) they think has an interesting story to “tell”. They should ask some questions and think about what it would answer if it could talk. Tell them to write down their interview. Some examples of questions include:

- . How old are you?
- . Are you afraid of anything?
- . Have you always lived here?
- . Who helps you and who do you help?
- . Do you live alone?
- . Where do you find food?
- . Do you like to live here? Why?
- . Have you always been this big/small?
- . Would you like to share something else about yourself that not many people know?

Activity: New Words

Create your own class glossary about the books' topics:

If the book(s) includes words that will possibly be new for your students, ask them to let you know every time they do not understand the meaning of a specific word. Students should try to work out the meaning of a word via the other words next to it and the pictures on that page. Then, ask students to use a dictionary, and search for the meaning of the "new words". Some books also have a glossary at the beginning or at the end.

My favourite words: Invite your students to write down 1-3 (or more) favourite words while they listen to the story. Make sure they understand that their words don't necessarily need be words they already know. They can be new words that sounded interesting.

Activity: Finding connections and differences between books.

If your school or local library has access to more ocean-related picture books, then you can encourage students to explore other books and find similarities and differences between them.

Similarities: providing books about the local temperate marine environment and look for similar animals, similar habitats, similar features.

Differences: once students are familiar with their local marine environment; they can go one step further and explore marine science books about another environments (tropical environment such as the Great Barrier Reef).

Activity: Create your own themed t-shirt

Ask students to bring a white t-shirt that they can paint on. Using resources for marking fabric (e.g. fabric markers, paint), challenge students to draw and paint anything they would like to wear related with the topic of the book. Another option is to paint a t-shirt for another student or swap t-shirts at the end of the activity.

Activity: Song writing and music creation

Invite your students to write the lyrics for a music about the story. Songwriting can be a challenging and rewarding activity for children. You can start by asking them to contribute with everything they know so far about the story in the book. Questions may arise during this process and you, and your students may need to conduct some research to fact-check. Put together a first draft of the song and test a few different rhythms and song patterns.

A few questions that Mary Amato ([website here](#)) suggest teachers to ask students during the songwriting process include:

- *Is there rhyme?*
- *What's the pattern of the song?*
- *What's the rhythm of the song?*
- *What's the emotion of the song?*
- *Does the rhythm and melody fit the emotion/meaning?*
- *What's the main idea of the song?*
- *Is there a chorus (a part that repeats)?*
- *Is there repetition?*
- *Is there a surprise?*

Exemplary practice:

Watch the [music video](#) [starting at min 4] from Operation Crayweed Marine Education Project led by Dr. Adriana Verges.

[Barry Peters \(Canya Dantz\)](#) is an Australian children's music singer songwriter that writes songs with environmental themes. Watch the [song and film clip](#) called Weedy Seadragon for some inspiration.

Note: *This is an excellent opportunity to collaborate with the music specialist teacher from your school.*

Activity: Small World Play

This activity is ideal to foster children's creativity, enhance the learning process and help to develop numeracy skills through categorizing, grouping, and counting items. A range of different materials can be used to create scenarios from stories or real life.

An underwater small world

Challenge your students to create an underwater small world below their desk/under their table. They can choose to work individually or in groups. To give them some inspiration, explore some picture books in class together and/or show them a few videos of the local marine life. Ask them to think about what they can use to create their underwater world and bring together the materials so the class can have access to them. In the end, children can invite their classmates to come around and have a look at their underwater world.



Fig. 10: Underwater small world
© Prue Francis

Challenges may arise when creating small worlds, such as conflict among younger children when working in a team. Students will be encouraged to find solutions by listening and respecting others, sharing tasks, and taking turns.

Note: this activity might seem more appropriate for younger children, but this is something that older children can create in their class and invite the younger grades to come around and have a look at. Older children can be encouraged to create various ecosystems such as intertidal zones, rock pools, kelp forests and sponge gardens. Also, this activity does not need to be conducted and finished in one day, this might be something that you agree to do with your students on a specific day(s) of the week for a certain period of time. This will also allow them to come up with more ideas and ask for help from their friends and family.

Games that foster creativity

Who am I?

This game follows a similar format to the game charades where players ask questions to guess the unknown organism. Divide the class into 4 or 6 groups. Two groups will play together: for example, students from group 1 will select a flashcard and place it facing down. Students in group 2 ask "Yes" or "No" questions with the aim to find out which organism was selected by group 1. You can choose the number of rounds, but each round should not go for more than 2 minutes. The winner is the group that correctly guesses the highest number of organisms within the timeframe.

There are a few different options for resourcing this activity. Students can simply choose one creature from the book(s). Alternatively, you may download, print and use the [GSR Totem Cards](#) or the ID cards created previously (see page 20).

Example of questions for marine animals:

- . Does it have a shell?
- . Does it eat seaweed?
- . Is it venomous?
- . Does it get exposed to the air during low tide?
- . Is it a primary producer/Does it photosynthesise?
- . Does it change colours to blend with its surroundings and hide from predators?
- . Is it an endemic species of the Great Southern Reef?
- . Does it have 5 arms?

Suggestion(s): Conduct this activity after your students already have some level of knowledge of the common marine life that can be found on the GSR. This game will allow children to strengthen and consolidate previous knowledge acquired.

Mimic game

Teachers will have to create cards/papers with a specific word or sentence about any topic in the book being explored. Students should form groups of 2 or more. Each round, members of the same team will have to work together with the goal of describing the secret word/sentence provided by the teacher. The teacher can set the number of rounds and time each team.

Card game

The Great Southern Reef official website offers great educational resources for teachers, including the [GSR totem cards](#). Teachers can print two sets of these cards, explore them with students in class and play the Memory game where students compete to try and find the matching cards as fast as possible.

Alternatively, the class can be challenged to create their own card deck with the local marine life. With teacher's help, students can laminate the cards for other educational activities.

Pictionary

For this game, students must be in teams of at least 2. Only one member of the team will draw a picture of what is described in the card and everyone else must try to guess what it is. We recommend allowing 60 seconds to draw. The team that guesses first wins that round. The teacher can determine at the beginning how many rounds will be conducted. The drawers and guessers should swap between rounds. For younger grades the card deck may focus on the marine species/characters from the books, but for older students, this game could be made more challenging by also including a category that has words to describe some of the marine science concepts that have been explored in previous

activities (e.g. photosynthesis, tides, salinity, foundation species, plastic pollution, climate change, predation, camouflage etc.)

Beach Bingo game

Prepare a bingo grid with as many columns and rows as you would like. In each square, write the name and/or the illustration of an animal, plant, seaweed and/or other items that can be found on your local coastal area. Alternatively, download our prepared Bingo Game [here](#). Organise students in small groups, each with a bingo board. Students should look for the marine organisms and/or other items in their bingo board when visiting their coastal marine environment. The first team to mark off all the squares in a row or in a diagonal is the winner. If you cannot take your students to the beach, adapt this game by hiding items in your classroom or school and play the same game.

Note: Try to create different bingo boards and add an illustration/picture of marine organisms that are easy to find and others a little more challenging (e.g. the seaweed, Neptune's necklace would be an easy seaweed to find on most rocky reefs on the GSR, however, the hermit crab might be more challenging. If you wish to discuss marine pollution, add a few items that don't belong to the beach but are often found there (e.g. a fishing line, plastics, etc).

Additional Resources

Children's literature about the ocean is a valuable learning tool for increasing ocean literacy in formal education.

Our team of marine science educators published a scientific paper titled "[Adopting Ocean-Themed Picture Books to Promote Ocean Literacy in Primary Education](#)" with the aim of providing educators with an overview of how picture books' written and visual strategies communicate ocean concepts, using some of the picture books in this guide. This analysis also describes how science and scientists are represented in the books, discusses sources of misconceptions, and provides suggestions for teachers selecting other picture books to enhance ocean education in their lessons.



Available to download [here](#).



Some picture books featured in this teacher's guide come with accompanying notes tailored for teachers. In your digital version of this guide, click the links provided below to access the teacher's notes. They will help you in broadening the range of activities you can conduct with students both inside and outside the classroom.



[The Way of the Weedy Seadragon](#) by Anne Morgan and Lois Bury (2021)



[Sea Country](#) by Aunty Patsy Cameron and by Lisa Kennedy (2021)



[The Great Southern Reef](#) by Paul Venzo, Prue Francis and Cate James (2022)



[Secrets of the Saltmarsh](#) by Claire Saxby and Alicia Rogerson (2023)

Additional Resources



Books are excellent resources to educate about Sea Country and encourage and support children to learn important elements of Aboriginal and Torres Strait Islander culture. Here are some examples:



The Time of Chaos by Carolyn Briggs and Balnarring Preschool (2023)



Respect by Fay Stewart-Muir Sue Lawson (2020)



Always Was, Always Will Be by Fay Stewart-Muir Sue Lawson (2024)



Songtimes on Wadawurrung Country by Songtimes and Wadawurrung Traditional Owners.



Deadly Science

A **non-for-profit organisation funded by Corey Tutt OAM**, dedicated to delivering STEM educational resources and learning opportunities to schools and communities located in regional and remote areas in Australia. Explore Deadly Science official website to find exceptional learning materials such as **teacher's guides** and **educational books** on various scientific subjects.



Coastcare Victoria Schools Kit

A **collection of 5 lesson plans** with engaging classroom activities, educational videos and teacher's resources to raise awareness of and connection with marine and coastal ecosystems of the Great Southern Reef.



OceansIQ

The **Australian Ocean Literacy Portal** is an online platform and a central hub for ocean education, providing resources and activities for educators while connecting communities to ocean literacy opportunities.

Certificate of completion

We encourage teachers to download and print the certificate of Ocean Literacy provided below and celebrate students' learning achievements. This certificate recognises students' progress and may spark a sense of responsibility and stewardship towards the ocean. Our goal is to keep children engaged and curious about the marine environment, its inhabitants, and strengthening their connection with the sea.

You may use this template or create your own to better fit the learning outcomes of this unit in your school. To make it extra special, you may consider organising a celebratory event where children can share their learning journey with the class and/or with the school community and receive the certificate during the event as a surprise.

Click [here](#) to download the certificate of completion.



Certificate of Ocean Literacy

This certificate is awarded to

for completing a module of study on the Great Southern Reef

This certificate demonstrates completion of reading and writing exercises about the Reef, and confirms that the recipient is now an Ocean Steward, who from this day forward will:

- Learn more about the ocean, its ecosystems, and animals.
- Teach others (especially adults) about the significance of the Great Southern Reef.
- Help to protect the ocean by recycling and cleaning up rubbish on the beach when safe to do so.



Observations Worksheet

Location _____ Weather conditions _____
Date _____ Time _____ Team members _____

Location	Organisms observed and number of observations. [Example: limpet (2); whelks (1)]	Notes
Upper zone 1		
Upper zone 2		
Upper zone 3		
Upper zone 4		
Upper zone 5		
Mid zone 1		
Mid zone 2		
Mid zone 3		
Mid zone 4		
Mid zone 5		
Low zone 1		
Low zone 2		
Low zone 3		
Low zone 4		
Low zone 5		

Notes: _____

Glossary

Adaptations: It happens when organisms become better suited to survive and reproduce in their environment.

Atmosphere: The layers of gases that surrounds the planet. Earth's atmosphere is composed of approximately 78% nitrogen, 21% oxygen, and one percent other gases.

Biodiversity: describes the variety of life (all living things) found in one area.

Bioluminescence: emission of light generated by a chemical reaction within a living organism.

Birdwatching: the practice of observing and identifying birds within their natural habitat.

Carbon: a naturally abundant chemical element that forms the basis of organic compounds essential for life on Earth.

Carbon dioxide: a colourless and odorless gas in Earth's atmosphere, usually resulting from the respiration of organisms and the combustion of organic matter.

Climate change: the long-term shifts in the weather patterns.

Climate: long-term pattern of weather prevailing in a particular area.

Density: a measure of mass per unit of volume.

Ecosystem: includes all the living organisms and their interaction between them and the physical environment, in a given area.

Extinct/Extinction: when a species is believed to have died out.

Filter feeders: organisms that obtain their food by filtering suspended particles/other organisms from the water column.

Foundation Species: species that have a strong role in determining the local biodiversity and regulating the ecosystem dynamics.

Grazers: organisms that rely on herbivory, feeding on vegetable substances, such as plants and seaweeds.

Habitat: the area or natural environment where an organism lives, including all living and non-living environmental factors.

IUCN: International Union for Conservation of Nature

Larvae: the immature stages of an organism that develops into different forms as it becomes an adult.

Marine algae: large group of organisms living in the ocean that have the ability to conduct photosynthesis.

Marine: existing in or produced by the sea.

Migrate/Migration: seasonal movement of organisms from one region to another, often for breeding, resting, and/or feeding.

Microbes: all forms of microscopic organisms such as bacteria, viruses and protozoa.

Nursery areas: in marine environments, it corresponds to an area that contributes to a recruitment greater than average number of individuals of a species, compared to other juvenile habitats.

Nutrient: a substance that an organism must obtain from its surroundings for life and growth.

Ocean current: the horizontal and vertical movement of water from one location to another powered by wind, differences in water density and tides.

Oxygen: a colourless, odorless gas essential to life on Earth. It makes up for approximately 21% of the earth's atmosphere.

Photosynthesis: process in which plants, algae and some types of bacteria use sunlight to produce oxygen and chemical energy from carbon dioxide and water.

Phytoplankton: microscopic photosynthetic marine algae that drift with the currents.

Plankton: usually microscopic plants and animals that drift with water currents.

Productivity: in ecology, it refers to the rate of formation of biomass in the ecosystem.

Scavengers: organisms that consume decaying biomass such as dead animals.

Seashore: land adjacent to the ocean.

Small World Play: an activity that allows children to create real world/ imaginative scenarios in a miniature play scene.

Species: a group of organisms that share common characteristics and can breed with each other.

Weather: short-term changes in atmospheric conditions such as temperature, humidity and precipitation.

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68. [Fig. 7] Image "Barwon Bluff Marine Sanctuary - Intertidal zone with a few rockpools" with permission to be used by the author (Prue Francis).
69. [Fig. 8] Image "Primary school students exploring the intertidal area" with permission to be used by the author (Catia Freitas).
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