Australian Government

**Great Barrier Reef
Marine Park Authority**

Instructional Manual for Reef Guides

Primary School

Part of the:
'*Be a Marine Biologist for a Day*' Toolkit

Comments and questions regarding this document are welcome and should be addressed to:

Australian Government
Great Barrier Reef
Marine Park Authority

Great Barrier Reef Marine Park Authority
280 Flinders Street
(PO Box 1379)
Townsville QLD 4810, Australia

Phone: (07) 4750 0700
Fax: (07) 4772 6093
Email: info@gbrmpa.gov.au
www.gbrmpa.gov.au

Preface

The Great Barrier Reef Marine Park Authority has produced this package of resources to assist reef guides working on tourism operations facilitate high quality educational excursions for students and teachers visiting the Great Barrier Reef. These resources will also assist teachers prepare students for their visit before their excursion and make further connections after.

Visiting the Great Barrier Reef is not just an amazing opportunity for all those involved. Reef activities undertaken by tourism operators, schools and other organisations make an important contribution to promoting understanding of the Great Barrier Reef Marine Park. Our Eye on the Reef monitoring and assessment program enables anyone who visits the Reef to contribute to its long-term protection by collecting valuable information about reef health, marine animals and incidents. These are used to understand the bigger picture and inform how we manage the Reef.

This toolkit uses our Eye on the reef rapid monitoring survey as the base survey tool used on reef visits and builds students' abilities to use this tool from prep through to senior school. The educational resources have been written by a Queensland marine science teacher with curriculum-linked content specific to each year level. What is fantastic about these resources is that they are editable, so that educators and reef guides can include local context, such as introducing tourism staff that students will meet and reef site-specific information. This gives students the ability to take their learning from the classroom to the coral.

This toolkit adds to the vast collection of educational materials the Great Barrier Reef Marine Park Authority has produced over many years. It looks forward to the knowledge and understanding this will bring to the tourism industry, as edutourism continues to grow, as well as educators and students.

Dear reef guide,

The purpose of these instructions are to give you an insight into the world of primary school in Queensland, Australia. Students in Prep to Year 6 are typically 4-11 years of age.

What to expect? Be prepared for cuteness overload. The students will be super excited, but also very compliant to instructions from the teacher. They will ask lots of questions and will want to share with you all that they love. You will be kept busy, but in the nicest possible way. They will believe all that you tell them, soaking it up like a great big sponge. The more interactive your presentations, the better. Plan ALL logistics ahead of time, such as moving from here to there, and waiting at regular intervals for students to catch up and stay together. Do regular head counts. Anticipate anything that could go wrong in the water, will go wrong. Plan to give yourself more time to do tasks that would otherwise take no time at all. That way, you are prepared for anything, and you're giving yourself every opportunity for the day to run smoothly. Involve teachers and parent helpers as much as you can.

Primary school excursions have more parent helpers than middle or senior school excursions. Parent helpers are not qualified to be responsible for students, nor do they have any duty of care. However, primary school teachers often rely on parent helpers to accompany small groups of 4-6 students – groups that typically include that parent's son or daughter and their friends – for that extra peace of mind. Groups are given cute names, like the shark group, the ray group, or the starfish group, with cute little name badges. Utilise parent helpers as much as you can.

The aim of these instructions are to help you to prepare for primary school excursion groups by becoming familiar with their experiences at school. In doing so, you will be able to connect the experiences they have at school with the experiences they have on the reef.

These instructions are divided into five sections. The first three sections are based on the Pedagogical Content Knowledge (PCK) model for teachers introduced at the beginning of this guide. Whereby, the first section is all about curriculum. Prep to Year 3 have been combined, and years 4, 5 and 6 are separate. It includes a list of the subject matter taught in Biology and Geography, as well as some sample assessment items, so you know the level of understanding expected of each subject. The second section is about how to teach with a selection of teaching pedagogies. Notably, the teaching pedagogy for this Be a Marine Biologist for a Day student program is an inquiry based pedagogy, with an overarching inquiry question that reads, 'How can I help the GBR?' The third section is about how students learn. The fourth section is about how to use the pre and post snorkel brief cards. The fifth and last section to this guide includes suggestions on how to customize the teacher resources in this program to your operation. I hope you enjoy delivering this program as much as I did writing it.

Yours thankfully,

Gail Riches
Commissioned author for *Be a Marine Biologist for a Day*
Owner of Marine Education (www.marineeducation.com.au) and Queensland secondary teacher.

What is in the toolkit?

Instructional manual for reef guides

Suggestions for tourism operators running Reef education programs for:

- primary school
- middle school
- senior school

Part 1 Preparing to find out

Pre-excursion resources for use at school:

- PowerPoint presentations
- student activity books

BE A MARINE BIOLOGIST FOR A DAY

Part 2 Finding out

On-day resources for use on the Reef excursion:

- PowerPoint presentations
- flip chart presentations
- student activity books
- rapid Monitoring survey tools

Part 3 Making connections

Post-excursion resources for use at school:

- PowerPoint presentations
- student activity books
- assessment tasks

Contents

Introduction

**Instructional Manual
for Reef Guides**

Edutourism

Tourism and Events Queensland define edutourism as tourism experiences designed or adapted to meet teaching, learning and experience requirements. They are experiences focused on hands-on learning within a tourism context, with potential for outcomes for local research or community programs. Edutourism can be delivered as stand-alone products within a study tour itinerary or packaged to offer authentic, immersive education programs of approximately one to two weeks. Similar to study tours, edutourism programs may or may not produce a formal study outcome/qualification.

If your tourism operation is looking to establish an edutourism product, refer to the Queensland Study Tours and Edutourism Toolkit. The toolkit has been designed to assist education providers and tourism operators in developing study tours and edutourism programs. It is supported by the Study Tours and Edutourism Opportunities Guide including case studies. The toolkit provides an overview of definitions, key success factors, elements of using a consortium-based approach, requirements for ensuring academic integrity, marketing methods, other considerations and sample itineraries.

https://teq.queensland.com/industry-resources/how-to-guides/queensland-study-tours-and-edutourism-toolkit

Be a Marine Biologist for a Day has been developed to provide resources with academic integrity and alignment with learning outcomes to present a high quality learning experience for students visiting the Reef.

Be a Marine Biologist for a Day program overview

This manual is part of a training toolkit to support the *Be a Marine Biologist for a Day* learning experience for students visiting the Reef with tourism operators. The toolkit is aimed to develop an understanding of, and appreciation for, the Great Barrier Reef. The main focus of the toolkit is to provide curriculum-linked and grade-appropriate teaching materials for reef guides on board tourism operations delivering education activities to students. The reef guides will lead students using simplified versions of the rapid monitoring survey tools on the Reef. The toolkit also includes pre and post-trip activities and resources that tourism operators can provide to teachers to support the learning objectives of the excursion.

A concept map of the toolkit for primary schools is below (there is also a guide for middle school and senior school excursions).
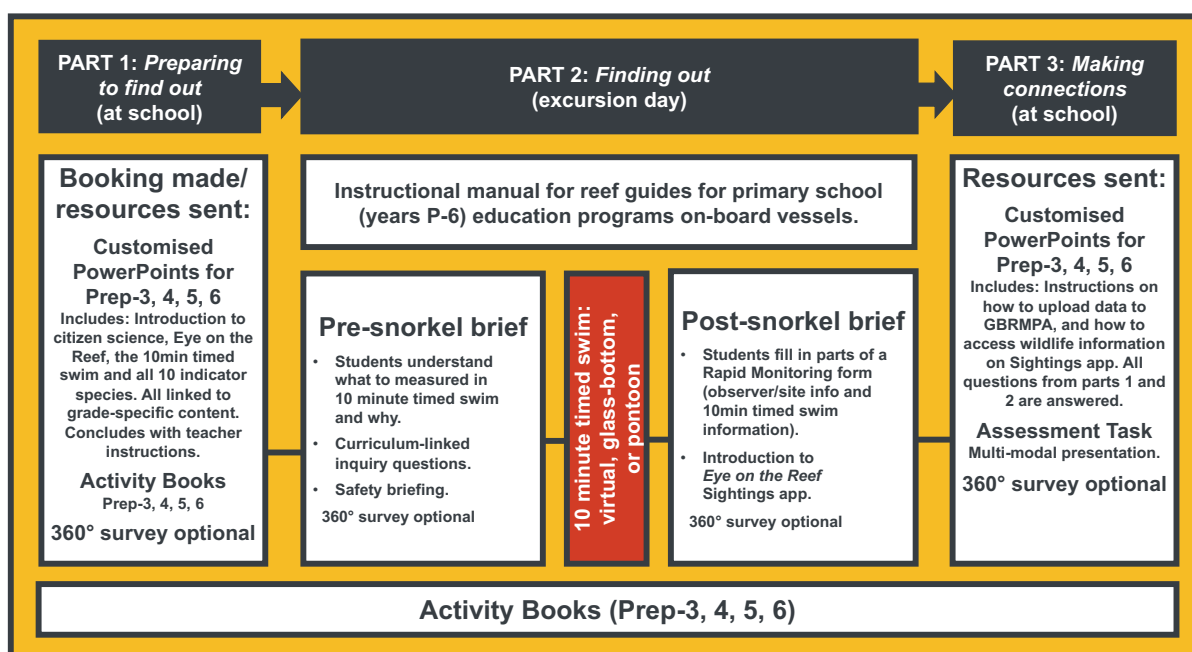
The toolkit consists of a three-part learning package:

Part 1 *Preparing to Find Out* **– pre-excursion resource kit for use at school**
Part 2 *Finding Out* **– on-day resource kit for use on the Reef**
Part 3 *Making Connections* **– post-excursion resource kit for use at school**

The toolkit is scaled to address three key learning target groups (primary, middle and senior school students) using an inquiry pedagogical model. Each group is further divided into year levels.

Resources are colour coded:

• Orange – Primary school (prep-year 6)
• Blue – Middle school (years 7-10)
• Purple – Senior school (years 11 and 12)
• Red – Additional resources and extension activities (advanced students)

This is the guide for primary school students (orange).

The resources for each part are outlined below:

Part 1: Preparing to find out

- Resources that reef guides can share with teachers to be delivered at school, prior to the Reef excursion.
- In-class delivered learning package aimed at preparing students for their reef excursion. The package develops understanding of the rapid monitoring survey tool as well as general Reef ecosystem and biodiversity knowledge.
- Materials and resources: PowerPoint(s), activity books with corresponding answer books, and teacher instructions (for you to edit/customise).

Part 2: Finding out

- Resources for reef guides to deliver a rapid monitoring survey to schools groups on their Reef excursions.
- Materials and resources: pre-snorkel brief cards/flip book and post-snorkel brief cards/flip book (developed in PowerPoint so you can edit/customise to your operation, before saving as a PDF and printing double-sided, to make waterproof flip books for use on the Reef). Both flip books include reef guide delivery instructions/cheat sheets to couple the rapid monitoring survey with grade-specific curriculum objectives.
- Modified rapid monitoring survey slates for students to tally their counts of individual species whilst in the water.
- This instructional manual for reef guides to teach target learning groups (primary, middle and senior levels) and things to consider when delivering educational programs on board vessels.

Part 3: Making connections

- Resources that reef guides can share with teachers to be delivered at school, after the Reef excursion. In-class delivered learning package aimed at reflecting on the Reef excursion and making new connections from the experience that teachers deliver at school.
- Materials and resources: PowerPoint(s) including a 30 question quiz, activity books with corresponding answer books (same as those used for part 1 and 2), and a multi-modal assessment task.
- Note: most primary school students are too young to safely conduct a 10-minute timed swim, as part of the rapid monitoring survey. Therefore, the primary school resources have been adapted to conduct the swim as a virtual activity or from a glass-bottom boat or pontoon. However, if it has been organised for the students to be in the water for the 10-minute timed swim, the middle school guide contains resources for conducting in-water surveys with young people.


Commonwealth of Australia (GBRMPA). Photographer: M. Knapton.

Be a Marine Biologist for a Day

Pedagogical content knowledge

Developing your educator skills

Pedagogical content knowledge is divided into three chapters, inspired by the concept that a good educator is someone who not only knows the content, but also knows how to teach and how students learn. These chapters are designed to prepare you to deliver high quality educational programs to students. They teach you what students are learning at school, how to teach them and how they learn. These will provide you with some basic theoretical knowledge of pedagogy (how to teach) that will support the skills you already have. This knowledge will become your pedagogical content knowledge (PCK). Which you will use to teach Part 2 of the *Be a Marine Biologist for a Day* program to school students.

This theory goes beyond basic instructional or interpretation methodology and is suited for reef guides and tourism operations wanting to deliver high quality education activities and programs to students.

Know the content

Know how to teach

Pedagogical Content Knowledge

Know how students learn
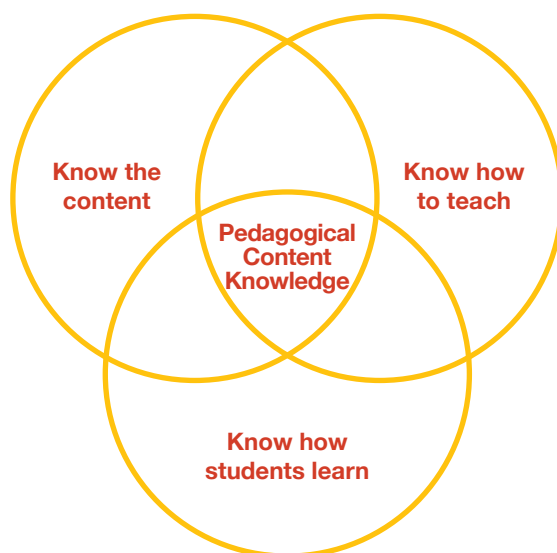
Pedagogical content knowledge was proposed by Lee Shulman in 1985-86 as a special amalgam of knowledge possessed by a teacher. As a reef guide delivering programs to students, you are essentially 'teaching' students on their excursion. PCK has since been widely researched and is regarded as a fruitful tool for understanding teacher knowledge. Just as every profession has a body of knowledge that sets it apart from others and makes people who master such skills considered professionals, so do teachers. PCK is sometimes called 'craft knowledge', or having knowledge of one's craft – being a teacher or educator. PCK is the blending of content (curriculum), pedagogy (how to teach) and learning into an understanding of how particular aspects of subject matter are organised, adapted and represented for instruction. It encompasses theory learned during teacher training and experiences gained from ongoing schooling activities. At the heart of effective teaching is the teacher's PCK.

Pedagogy can be defined as the art of teaching. It involves being able to convey knowledge and skills in ways that students can understand, remember and apply. Pedagogy also defines the methods for conducting teaching-learning sessions. It includes the strategies and approaches adopted by teachers to ensure meaningful learning sessions for students.

Know the content

Overview of mainstream schooling in Australia

Prep to year 10

The Australian Curriculum Assessment and Reporting Authority (ACARA) developed the Australian curriculum for prep to year 10. Learning areas include English, mathematics, science, humanities and social sciences (includes geography and history), the arts, technologies, health and physical education, languages, and work studies (years 9 and 10).

In addition, there are three cross-curriculum priorities and seven general capabilities that teachers should integrate into all learning areas. The cross-curriculum priorities are Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia's engagement with Asia, and sustainability.

The general capabilities are literacy, numeracy, information and communication technology, critical and creative thinking, personal and social capability, intercultural understanding, and ethical understanding.

You can find further details about the Australian curriculum online at www.acara.edu.au

The Great Barrier Reef in the Australian curriculum

Most primary schools that visit the Reef book the excursion for science and/or humanities and social sciences (HASS), including geography. These subjects are the most compatible with the rapid monitoring survey.

Science

Science understanding is taught over four terms: biology, chemistry, Earth and space science, and physics.

Science is divided into three sub-strands:

• Science understanding (biology, chemistry, Earth and space science, physics)
• Science as a human endeavour (students learn who the scientists were/are)
• Science inquiry skills (practical skills).

The curriculum that matches the Eye on the Reef program best is biology and science inquiry skills.

Humanities and social sciences

Knowledge and understanding is taught over two semesters: geography and history.

HASS is divided into two sub-strands:

1) Knowledge and understanding (Geography, History)
2) Inquiry and skills (questioning, researching, analysing, evaluating and reflecting, communicating).

The curriculum that matched the Eye on the Reef program best is geography (in knowledge and understanding) and inquiry and skills.

Content descriptions

Content descriptions describe what is to be taught and what students are expected to learn. They feature as dot points in every Australian curriculum. All content descriptions are mandatory. Thus, schools must teach what appears in each content description. Content descriptions are accompanied by content elaborations, which are optional and provided to give teachers ideas about how they might teach the content.

This instructional manual, and the student and teaching resources blend the content descriptions from Prep with years 1, 2 and 3. Years 4, 5 and 6 are described separately and have different resources.

Prep to year 3 curriculum
Biology

In biology, students are learning about living things.

Prep	Year 1	Year 2	Year 3
Survival needs	External features and habitat	Growth and reproduction	Living versus non-living

The mandatory content descriptions for biology are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for prep to year 3 are identified in italics.

Content descriptions for biology

Prep

• *Living things have basic needs*, including food and water.

Year 1

• Living things have a variety of *external features.*
• *Living things live in different places* where their needs are met.

Year 2

• *Living things grow, change and have offspring* similar to themselves.

Year 3

• *Living things can be grouped on the basis of observable features* and can be distinguished from non-living things.

Science inquiry skills (SIS)

SIS	Prep	Year 1	Year 2	Year 3
Questioning and predicting	Ask questions and make predictions.			Ask scientific questions and make predictions based on prior knowledge.
Planning and conducting	Collect and record observations (guided) using the senses.	Collect and record observations (guided) .		Plan and conduct scientific investigations.
Processing and analysing data and information	Discuss observations and represent ideas.	Sort information using various methods.		Graph data and identify patterns and trends.
Evaluating	n/a	Compare observations .		Evaluate if it was a fair test or not.
Communicating	Share observations and ideas.	Communicate ideas in a variety of ways.		Communicate ideas in a variety of ways.

Student work examples (prep to year 3)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

PREP

YEAR 1

YEAR 2

YEAR 3

Prep to year 3 curriculum
Geography

In geography, students are learning about places. This could include the Great Barrier Reef.

Prep	Year 1	Year 2	Year 3
My personal world	How to care for places	People and places	Australia

The mandatory content descriptions for geography are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for prep to year 3 are identified in italics.

Relevant content descriptions for geography

Prep

• The reasons why some *places* are special to people, and *how they can be looked after*.

Year 1

• *The natural*, managed and constructed *features of places*, their location, how they change and *how they can be cared for*.

Year 2

• The influence of purpose, distance and accessibility on the *frequency with which people visit places*.

Year 3

• The representation of Australia as states and territories and as Countries/Places of Aboriginal and Torres Strait Islander Peoples; and *major places in Australia*, both natural and human.

HASS inquiry and skills (prep to year 3)

	Prep	Year 1	Year 2	Year 3
Questioning	Pose questions about past and present objects, people, places and events.			Pose questions to investigate people, events, places and issues.
Researching	Collect data and information from observations and identify information and data from sources provided. Sort and record information and data including location, in tables and on plans and labelled maps. Sequence familiar objects and events.			Collect data. Record, sort and represent data. Sequence information about people's lives and events.
Analysing	Explore a point of view. Compare objects from the past with those from the present and consider how places have changed over time. Interpret data and information displayed in pictures and texts and on maps.			Identify different points of view and distinguish fact from opinions. Interpret data in different formats.
Evaluating and reflecting	Draw simple conclusions based on discussions, observations and information displayed in pictures and texts and on maps. Reflect on learning to propose how to care for places and sites that are important or significant.			Analyse and draw simple conclusions. Interact with others with respect to share points of view. Reflect on learning to propose actions.
Communicating	Present narratives, information and findings in oral, graphic and written forms using simple terms to denote the passing of time and to describe direction and location.			Present ideas, findings and conclusions in digital and non-digital representations.

Student work examples (prep to year 3)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

PREP

My cousin lives at the beach. I like to play tips and football at the beach with my cousin. There are also lots of seagulls to chase.

YEAR 1

YEAR 2

YEAR 3

Year 4 curriculum
Biology

In biology, students are learning about life cycles and survival.

The mandatory content descriptions for biology are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 4 are identified in italics.

Relevant content descriptions for biology

- Living things have *life* cycles.
- Living things depend on each other and the environment to *survive.*

Science inquiry skills

| SIS	Year 4
Questioning and predicting	• With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge.
Planning and conducting	• With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment. • Consider the elements of fair tests and use formal measurements and digital technologies as appropriate, to make and record observations accurately.
Processing and analysing data and information	• Use a range of methods including tables and simple column graphs to represent data and identify patterns and trends. • Compare results with predictions, suggesting possible reasons for findings.
Evaluating	• Reflect on investigations, including whether a test was fair or not.
Communicating	• Represent and communicate observations, ideas and findings using formal and informal representations.

Student work example (year 4)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

Living on the reef

Draw the **living** and **non-living** parts of the reef. Make sure you include these types of animals: a predator, a prey, a scavenger, a herbivore, and a carnivore. Label all the parts of your diagram.

Challenge: Can you draw a relationship where two organisms (hint: one is an algae!) help each other to survive? Label this with a star!
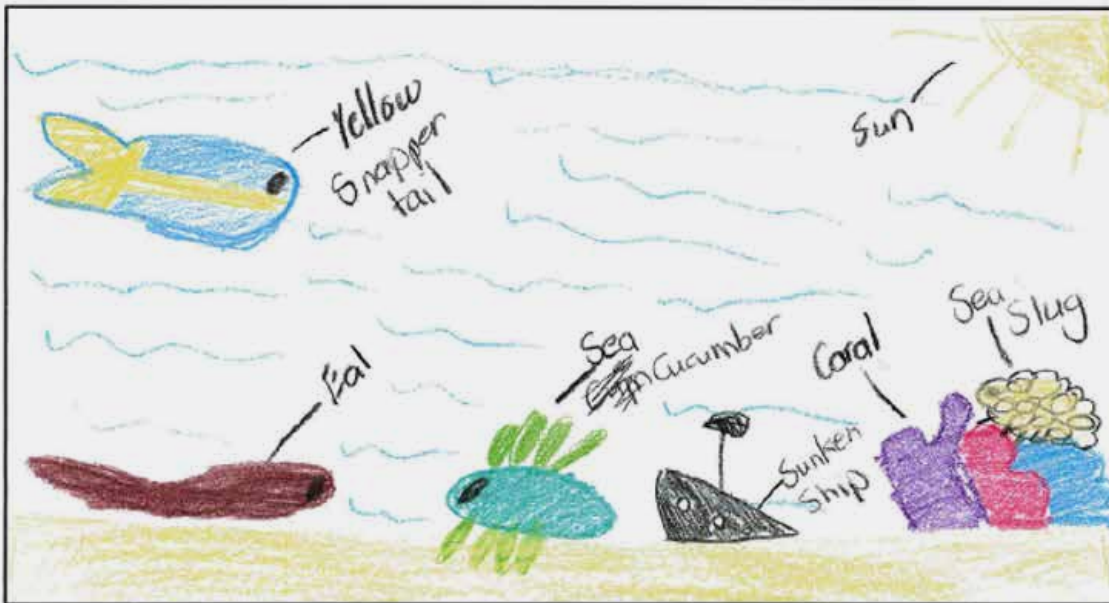
My animal is: _Shark. A shark is a predater._

Survival needs of my animal:

Non-living parts of the environment

Part	Because...
Water	Water helps it breath since it has gills

Living parts of the environment

Part	Because...
Fish	It has meat in its body which the Shark feeds on
Human	It has meat in its body which the Shark feeds on!

If we took away _water_ (non-living part) from the environment, my animal would _not be able to breath and it would die._

If we took away _one type of fish_ (living part) from the environment, my animal would _eat another kind of fish._

Year 4 curriculum
Geography

In geography, students are learning about sustainability.

The mandatory content descriptions for geography are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 4 are identified in italics.

Relevant content descriptions for geography

- The main characteristics of the continents of Africa and South America and the location of their major countries in relation to Australia.
- *The importance of environments*, including natural vegetation, to animals and people.
- The custodial responsibility Aboriginal and Torres Strait Islander Peoples have for Country/Place, and how this influences views about sustainability.
- *The use and management of natural resources and waste*, and the different views on how to do this sustainably.

HASS inquiry and skills

	Year 4
Questioning	Pose questions to investigate people, events, places and issues.
Researching	Locate and collect information and data from different sources, including observations. Record, sort and represent data and the location of places and their characteristics in different formats, including simple graphs, tables and maps, using discipline-appropriate conventions. Sequence information about people's lives and events.
Analysing	Examine information to identify different points of view and distinguish facts from opinions. Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns.
Evaluating and reflecting	Draw simple conclusions based on analysis of information and data. Interact with others with respect to share points of view. Reflect on learning to propose actions in response to an issue or challenge and consider possible effects of proposed actions.
Communicating	Present ideas, findings and conclusions in texts and modes that incorporate digital and non-digital representations and discipline-specific terms.

Suggested inquiry questions for geography

- How does the environment support the lives of people and other living things?
- How do different views about the environment influence approaches to sustainability?
- How can people use environments more sustainably?

Student work example (year 4)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

Reducing my rubbish is important because:

It means there will be less methane in the air that can harm the environment. (1)

There will be less rubbish going to landfill

Landfill is bad for the environment because it can make people sick and kills animals (2)

Graph

My Rubbish

Bar graph titled "My Rubbish". Y-axis: Pieces of rubbish (0 to 14). X-axis: Method of disposal.
- Rubbish Bin: 13 (3)
- Recycled: 6
- Reused: 0 (4)
- Composted: 4

Recycling/Reusing/Composting		
Plus + good positives	Minus – bad negatives	Interesting? New things I found out
That if you have a rabbit or chicken you can give them vegie scraps. If you have fabric in the cupboard and you want a toy make one instead or make clothes. (5) That if we keep recycling there will be less rubbish. That many people recycle, reuse and reduce.	That too many people don't recycle thing that you can. That too many people want things that they dont need. Most people don't recycle as often as they should. (6)	That there is a landfill that can hold 13,000. That our class had 94 bits of rubbish That the US has the most rubbish out of all the countries.

Year 5 curriculum
Biology

In biology, students are learning about adaptations.

The mandatory content descriptions for biology are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 5 are identified in italics.

Content descriptions for biology

• Living things have structural features and *adaptations* that help them to survive in their environment.

Science inquiry skills

SIS	Year 5
Questioning and predicting	• With guidance, pose clarifying questions and make predictions about scientific investigations.
Planning and conducting	• Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks. • Decide variables to be changed and measured in fair tests, and observe, measure and record data with accuracy using digital technologies as appropriate.
Processing and analysing data and information	• Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate. • Compare data with predictions and use as evidence in developing explanations.
Evaluating	• Reflect on, and suggest improvements to, scientific investigations.
Communicating	• Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts.

Student work example (year 5)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

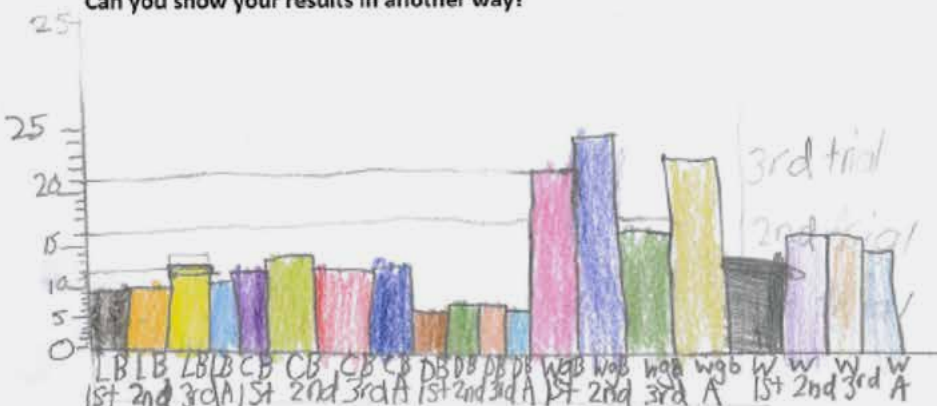*Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/*

Bird Beaks

I picked _tweesers_ to represent the _Kiwi_ beak because _the kiwi beak is sharp point likeB tweesers_

Food	1st Trial	2nd Trial	3rd Trial	Average
Lima beans	9	9	12	10
Cannellini beans	11	13	11	11.66
Dry beans	5	6	6	5.66
Whole green Lentils	21	25	19	21.66
Worms	12	16	16	14.66

Can you show your results in another way?

Conclusion
I found out that the whole green Lentils were easy to pick.

Predict where you would find this bird in the wild.
In rainforest, forest and on the ground looking for grugs, little beatle and insects.

Selects a tool to model the beak, based on structural properties of the beak.

Be a Marine Biologist for a Day

Year 5 curriculum
Geography

In geography, students are learning about people and places.

The mandatory content descriptions for geography are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 5 are identified in italics.

Content descriptions for geography

- The influence of people on the environmental characteristics of places in Europe and North America and the location of their major countries in relation to Australia.
- The influence of people, including Aboriginal and Torres Strait Islander Peoples, on the environmental characteristics of Australian places.
- *The environmental and human influences on the location and characteristics of a place and the management of spaces within them.*
- The impact of bushfires or floods on environments and communities, and how people can respond.

HSS inquiry and skills

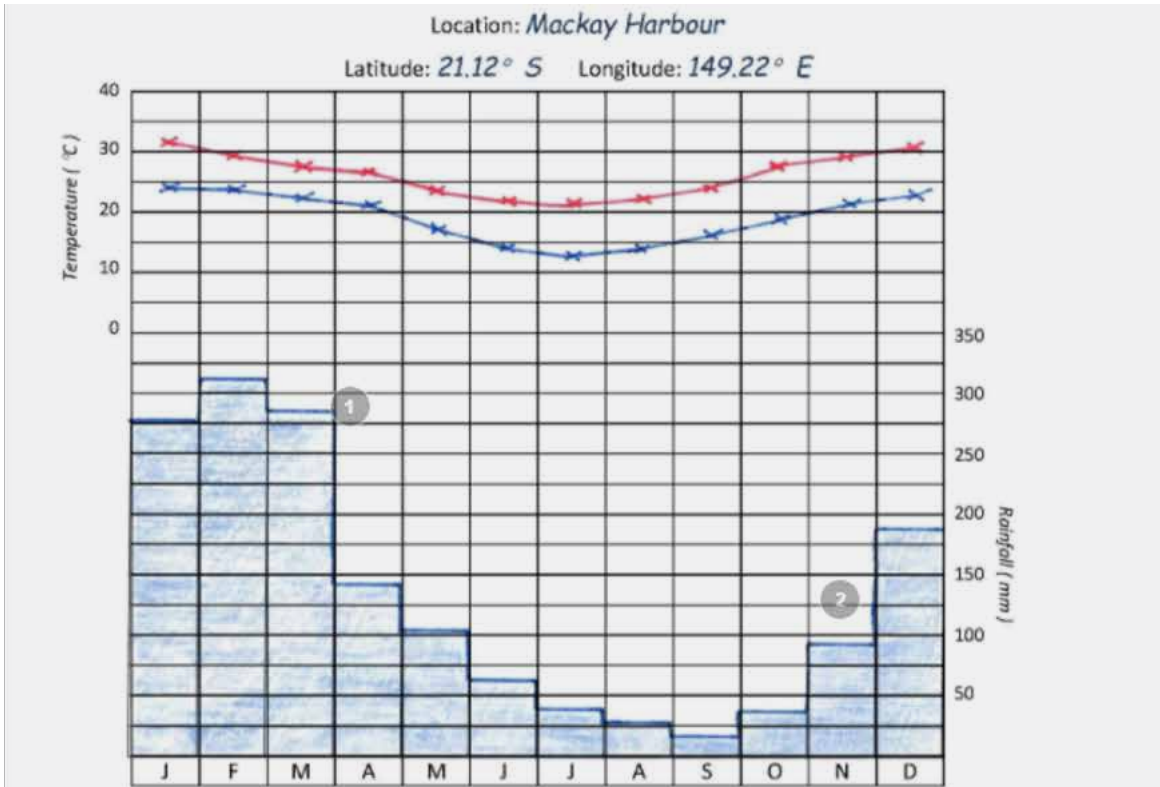|	Year 5
Questioning	Develop appropriate questions to guide an inquiry about people, events, developments, places, systems and challenges.
Researching	Locate and collect relevant information and data from primary sources and secondary sources. Organise and represent data in a range of formats including tables, graphs and large and small-scale maps, using discipline-appropriate conventions. Sequence information about people's lives, events, developments and phenomena using a variety of methods including timelines.
Analysing	Examine primary sources and secondary sources to determine their origin and purpose. Examine different viewpoints on actions, events, issues and phenomena in the past and present. Interpret data and information displayed in a range of formats to identify, describe and compare distributions, patterns and trends, and to infer relationships.
Evaluating and reflecting	Evaluate evidence to draw conclusions. Work in groups to generate responses to issues and challenges. Use criteria to make decisions and judgements and consider advantages and disadvantages of preferring one decision over others. Reflect on learning to propose personal and/or collective action in response to an issue or challenge, and predict the probable effects.
Communicating	Present ideas, findings, viewpoints and conclusions in a range of texts and modes that incorporate source materials, digital and non-digital representations, and discipline-specific terms and conventions.

Suggested inquiry questions for geography

- How do people and environments influence one another?
- How do people influence the human characteristics of places and the management of spaces within them?
- How can the impact of bushfires or floods on people and places be reduced?

Student work example (year 5)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

Location: Mackay Harbour
Latitude: 21.12° S   Longitude: 149.22° E

What do the photos and the climate graph tell you about Mackay Harbour?

The photos and the climate graph tell me that Mackay Harbour is a good place to live. There are beaches and a harbour for sailing boats and big ships as well. The temperature doesn't change very much over the year but it is much wetter in summer and autumn and much drier in winter and spring.

What is Mackay Harbour used for?
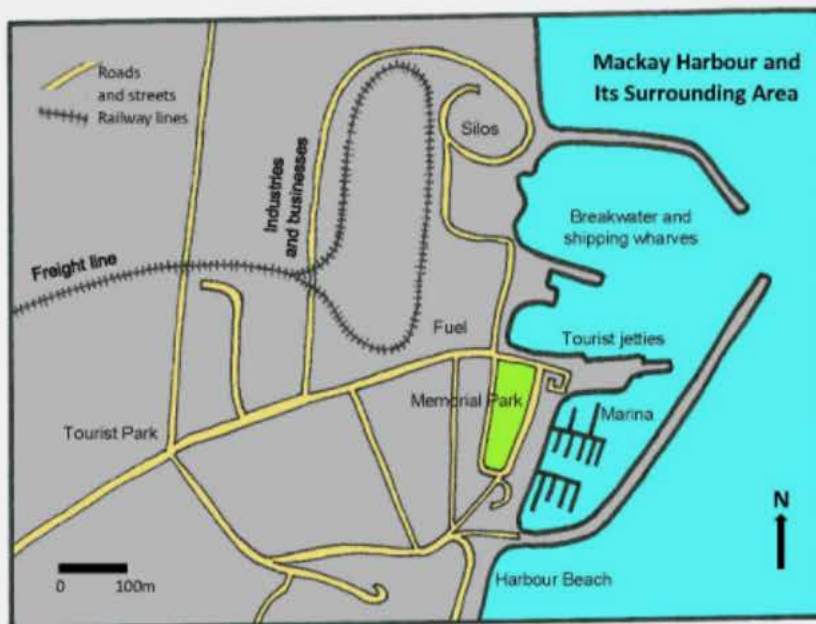
Year 6 curriculum
Biology

In biology, students are learning about growth and survival.

The mandatory content descriptions for biology are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 6 are identified in italics.

Content descriptions for biology

- The *growth* and survival of living things are affected by physical conditions of their environment.

Science inquiry skills

	Year 6
Questioning and predicting	• With guidance, pose clarifying questions and make predictions about scientific investigations.
Planning and conducting	• Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks. • Decide variables to be changed and measured in fair tests, and observe, measure and record data with accuracy using digital technologies as appropriate.
Processing and analysing data and information	• Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate. • Compare data with predictions and use as evidence in developing explanations.
Evaluating	• Reflect on, and suggest improvements to, scientific investigations.
Communicating	• Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-model texts.

Student work example (year 6)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

Bags

Bag 1: In sunlight with no water and heat.

Bag 2: In sun and heat with one tablespoon of water.

Bag 3: In sun and heat with two tablespoon of water.

Bag 4: No light or heat and no water.

Bag 5: no light or heat with one tablespoon of water.

Bag 6: no light or heat with two tablespoon of water.
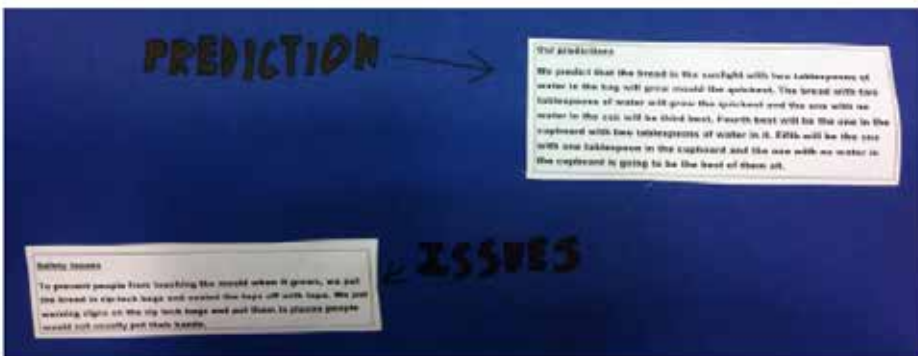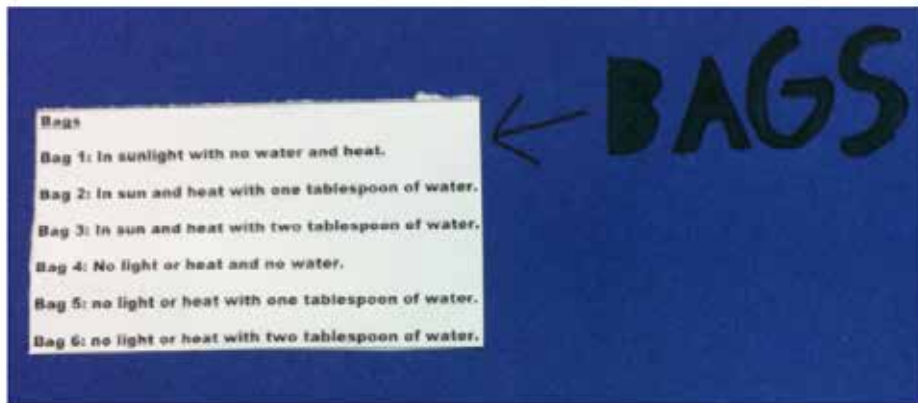
Part of an investigation poster: mouldy bread

Year 6 curriculum
Geography

In geography, students are learning about the world.

The mandatory content descriptions for geography are below. Key concepts that form the main topics of inquiry in a rapid monitoring survey for year 6 are identified in italics.

Content descriptions for geography

- The geographical diversity of the Asia region and the location of its major countries in relation to Australia.
- Differences in the economic, demographic and social characteristics of *countries across the world.*
- The world's cultural diversity, including that of its Indigenous peoples.
- *Australia's connections* with other countries and how these change people and places.

HSS inquiry and skills

	Year 6
Questioning	Develop appropriate questions to guide an inquiry about people, events, developments, places, systems and challenges.
Researching	Locate and collect relevant information and data from primary sources and secondary sources. Organise and represent data in a range of formats including tables, graphs and large and small-scale maps, using discipline-appropriate conventions. Sequence information about people's lives, events, developments and phenomena using a variety of methods, including timelines.
Analysing	Examine primary sources and secondary sources to determine their origin and purpose. Examine different viewpoints on actions, events, issues and phenomena in the past and present. Interpret data and information displayed in a range of formats to identify, describe and compare distributions, patterns and trends, and to infer relationships.
Evaluating and reflecting	Evaluate evidence to draw conclusions. Work in groups to generate responses to issues and challenges. Use criteria to make decisions and judgements and consider advantages and disadvantages of preferring one decision over others. Reflect on learning to propose personal and/or collective action in response to an issue or challenge, and predict the probable effects.
Communicating	Present ideas, findings, viewpoints and conclusions in a range of texts and modes that incorporate source materials, digital and non-digital representations, and discipline-specific terms and conventions.

Suggested inquiry questions for geography

- How do places, people and cultures differ across the world?
- What are Australia's global connections between people and places?
- How do people's connections to places affect their perception of them?

Student work example (Year 6)

The following student work samples were taken from ACARA, to give you a level of understanding about what students' work looks like and what you can expect them to complete.

Source: https://www.australiancurriculum.edu.au/resources/work-samples/science-work-samples-portfolios/

My suitcase

My name is Tran and the date is the first of April 1978. We are escaping Vietnam because of the war. We are fleeing on a fishing boat disguised as fishermen and woman. I have ten possessions that I am taking with me in a suitcase that I have brought for the trip.

The ten items I am bringing are

1. A family photo: that was taken the day I received my first communion. This photograph will remind me of their smiling faces and will make me happy on the sad trip.

2. Jewellery: I am bringing a watch that my mum gave me for Christmas. I will use this to tell the time before I sell it.

3. Pocket knife: I will use this pocket knife for self-protection and if we catch a fish I can filet it.

4. Diary: In this diary I will record my life and hopefully use what I have written in the diary to send to my beloved friends and family.

5. and 6. Small sacks of food: the two sacks are filled with the only food that I could get my hands on. The food is mainly rice and small amounts of honey.

7. Blanket: so I can stay warm on the cold sea, and when it's raining the blanket will give me shelter.

8. First aid kit: so if I get shot by a weapon while trying to escape the country.

9. Jumper: for protection for the new climate which will be colder than at home.

10. Water canteen: for drinking from when I am thirsty or dehydrated from being in the hot sun of the sea.

These are the ten vital things I will bring on my long trip overseas.

Summary of curriculum links to resources/themes

Overarching inquiry question: *how can I help the Great Barrier Reef?*

Year	*Be a Marine Biologist for a Day*	Mandatory ACARA content descriptions
Prep to Year 3	• Living things • Places	**BIOLOGY:** Prep: *Living things have basic needs*, including food and water. Year 1: Living things have a variety of external features. *Living things live in different places where their needs are met.* Year 2: *Living things grow, change and have offspring similar to themselves.* Year 3: *Living things can be grouped on the basis of observable features* and can be distinguished from non-living things. **GEOGRAPHY:** Prep: The reasons why some *places are special to people*, and how *they can be looked after*. Year 1: The natural, managed and constructed features of places, their location, how they change and how they can be cared for. Year 2: The influence of purpose, distance and accessibility on the frequency with which people visit places. Year 3: The representation of Australia as states and territories and as Countries/Places of Aboriginal and Torres Strait Islander Peoples; and major places in Australia, both natural and human.
Year 4	• Life cycle • Survival • Sustain-ability	**BIOLOGY:** *Living things have life cycles. Living things depend on each other and the environment to survive.* **GEOGRAPHY:** The main characteristics of the continents of Africa and South America and the location of their major countries in relation to Australia. The *importance of environments, including natural vegetation, to animals and people*. The *custodial responsibility Aboriginal and Torres Strait Islander Peoples have for Country/Place*, and how this influences views about *sustainability*. The *use and management of natural resources* and waste, and the different *views on how to do this sustainably*.
Year 5	• Adaptations • People and place	**BIOLOGY:** *Living things have structural features and adaptations that help them to survive in their environment.* **GEOGRAPHY:** The influence of people on the environmental characteristics of places in Europe and North America and the location of their major countries in relation to Australia. The influence of people, including Aboriginal and Torres Strait Islander Peoples, on the *environmental characteristics of Australian places*. The *environmental and human influences on the location and characteristics of a place* and the *management of spaces within them*. The impact of bushfires or floods on environments and communities, and how people can respond.
Year 6	• Growth • Survival • The World	**BIOLOGY:** The *growth and survival* of living things are affected by physical conditions of their environment. **GEOGRAPHY:** The geographical diversity of the Asia region and the location of its major countries in relation to Australia. Differences in the economic, demographic and social characteristics of countries across the world. The world's cultural diversity, including that of its Indigenous peoples. *Australia's connections* with other countries and how these change people and places.

Know how
to teach

**Instructional Manual
for Reef Guides**

Teacher qualifications and experience

The following information gives you an understanding of the qualifications and experience teachers and other school staff may have. This will help you understand why you may have different experiences with different teachers. Teacher are humans too, but they may come from very different levels of experience, knowledge and comfort on excursions.

Teaching qualifications in Australia

To teach in Australia, you must hold a degree with a minimum of four years' tertiary study. That must include university-based assessment on site, and at least 45 days' supervised teaching practice in primary or secondary schools. Qualifications may include:

- a four year Bachelor of Education degree
- a three year Bachelor's degree (in anything) plus a Post Graduate Certificate in Education (PGCE) in primary or secondary, such as a Masters or Graduate Diploma of Education.

Teacher registration

All teachers in Australia must hold teaching registration with the board of education of the state or territory they intend to teach in. For Queensland, the board of education is the Queensland College of Teachers (QCT).

Queensland College of Teachers

To be eligible for registration, teachers must have appropriate qualifications, meet the English language proficiency requirements (if applicable) and meet the 'suitability to teach' criteria. After registration has been granted, teachers are eligible to seek employment in any Queensland school. Note: all teachers must start on a preliminary registration before moving on to full registration (even experienced teachers arriving to Queensland).

One of the requirements of moving from preliminary registration to full registration is to create a folder of evidence, gathered over one year (200 days) of teaching in Queensland post graduation. The evidence folder must demonstrate the teacher is competent in all the *Australian Professional Standards for Teachers* as outlined by the Australian Institute for Teaching and School Leadership (AITSL). A component of maintaining current registration is police checks to be able to work with children. In Queensland, this is a 'working with children' Blue Card.

Primary school teaching pedagogies

Professional development is an annual requirement for teachers with full registration regardless of whether they are teaching full-time or part-time, or undertaking supply or contract teaching. Teachers must complete 20 hours of professional development for any year they teach 20 days or more. Professional development aims to make teachers better teachers. Professional development topics range from behaviour management seminars, to learning a new curriculum, to the critical evaluation of teacher pedagogies.

Pedagogy is often described as the act of teaching. The pedagogy adopted by teachers shapes their actions, judgements and other teaching strategies by taking into consideration theories of learning, understandings of students and their needs, and the backgrounds and interests of individual students. The field relies heavily on educational psychology, which encompasses scientific theories of learning, and to some extent on the philosophy of education, which considers the aims and value of education from a psychological perspective.

Productive pedagogies

Twenty pedagogy examples are outlined below. Grouped into four categories, they form a framework known as the *Productive Pedagogies* framework. The framework is used in schools across Queensland to support teachers to critically reflect on their practice. It was first developed by the Queensland Department of Education during a landmark Queensland School Reform Longitudinal Study in 1998–2001. The study involved the observation of approximately 1000 classrooms over a three year period to examine the links between classroom practices and improved learning. The main concerns raised in that study related to low levels of quality pedagogy in Queensland classrooms. Teachers are now encouraged to use the framework to assess the quality of their teaching. Productive Pedagogies includes a range of pedagogies that together constitute a framework for 21st Century learning and teaching.
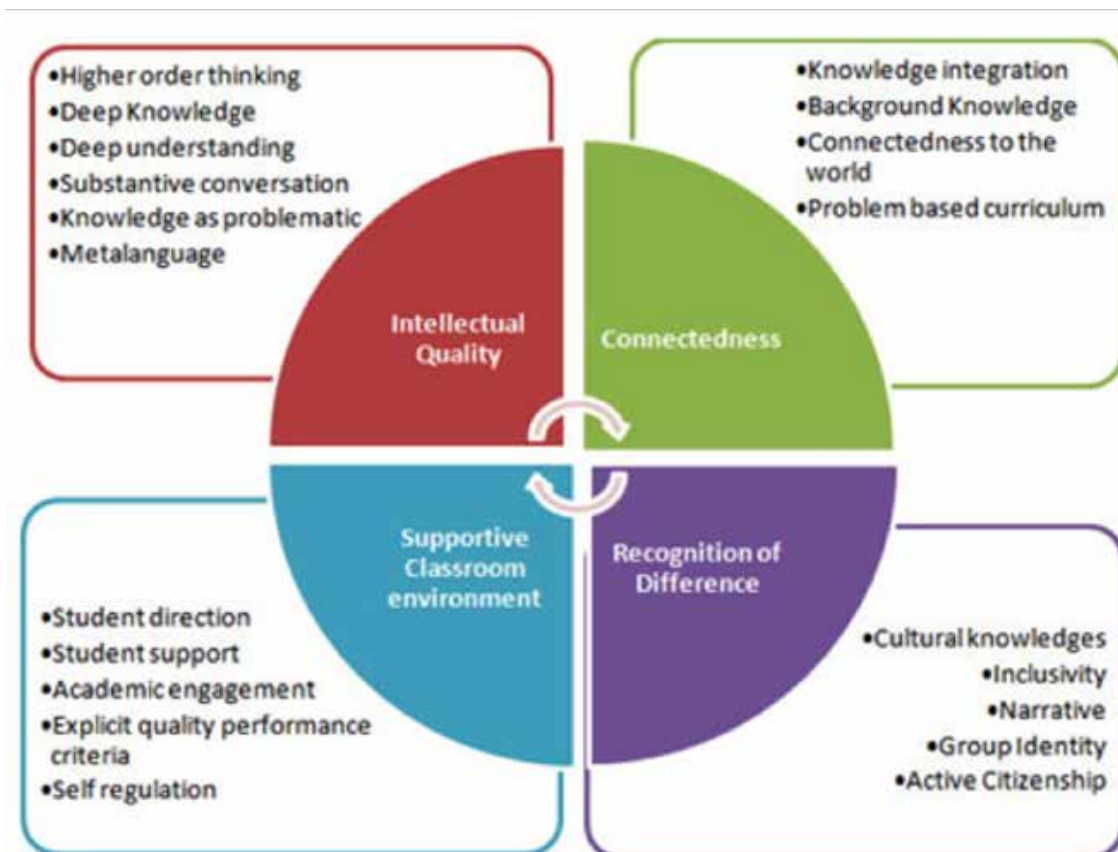
The Productive Pedagogies framework has been taken up widely in Australia and internationally as both a research tool and communication tool to support teachers to critically reflect on their practice. For example, when used in professional development, teachers answer the questions below to assess the quality of their teaching and identify areas for improvement.

Although reef guides only have the students for a short period of time, answering the questions below will give you a better understanding of the teaching pedagogies at school, so you can match them on the excursion. The questions with an asterisk are particularly relevant and easy to action during field trips for *Be a Marine Biologist for a Day*.

INTELLECTUAL QUALITY	
Higher order thinking	Are higher order thinking and critical analysis occurring?
* Deep Knowledge	Does the lesson cover operational fields in any depth, detail or level of specificity?
* Deep understanding	Do the work and response of the students provide evidence of understanding of concepts or ideas?
* Substantive conversation	Does classroom talk break out of the initiation/ response/ evaluation pattern and lead to sustained dialogue between students, and between teachers and students?
Knowledge problematic	Are students critiquing and second-guessing texts, ideas and knowledge?
* Metalanguage	Are aspects of language, grammar, and technical vocabulary being foregrounded?
RELEVANCE	
Knowledge integration	Does the lesson range across diverse fields, disciplines and paradigms?
* Background knowledge	Is there an attempt to connect with students' background knowledge?
* Connectedness to the world	Do lessons and the assigned work have any resemblance or connection to real life contexts?
* Problem based curriculum	Is there a focus on identifying and solving intellectual and/or real-world problems?
SUPPORTIVE CLASSROOM ENVIRONMENT	
Student control	Do students have any say in the pace, direction or outcome of the lesson?
* Social support	Is the classroom a socially supportive, positive environment?
* Engagement	Are students engaged and on-task?
Explicit Criteria	Are criteria for student performance made explicit?
Self-regulation	Is the direction of student behaviour implicit and self-regulatory or explicit?
RECOGNITION OF DIFFERENCE	
Cultural knowledges	Are diverse cultural knowledges brought into play?
* Inclusivity	Are deliberate attempts made to increase the participation of all students of different backgrounds?
Narrative	Is the teaching principally narrative, or is it expository?
* Group Identity	Does teaching build a sense of community and identity?
Citizenship	Are attempts made to foster active citizenship?

Inquiry-based learning

Inquiry-based learning is an approach to learning that emphasises the student's role in the learning process. Rather than the teacher telling students what they need to know, students are encouraged to explore the material, ask questions and share ideas. The *Be a Marine Biologist for a Day* program uses inquiry-based learning.

Inquiry-based learning usually starts by asking a question or posing a problem – rather than simply presenting established facts or portraying a smooth path to knowledge. In short, during the learning process, the content is unwrapped by the student, as opposed to being told, memorised and recalled.

From a student's point of view, inquiry-based learning focuses on investigating an open question or problem. They must use evidence-based reasoning and creative problem-solving to reach a conclusion, which they must defend or present.

From a teacher's point of view, inquiry-based teaching focuses on moving students beyond general curiosity into the realms of critical thinking and understanding. They must encourage students to ask questions and support them through the investigation process, understanding when to begin and how to structure an inquiry activity.

The 5E Model

The 5Es stand for engage, explore, explain, elaborate and evaluate. It is an inquiry-based instructional model drawn from cognitive psychology and constructivist theory (constructivist theory suggests that people construct knowledge and meaning from experiences). It is now used as a popular reference point for teachers to develop a deeper understanding of what constitutes high quality teacher practice in the classroom. The 5Es can be used over a unit of work, or over one lesson.
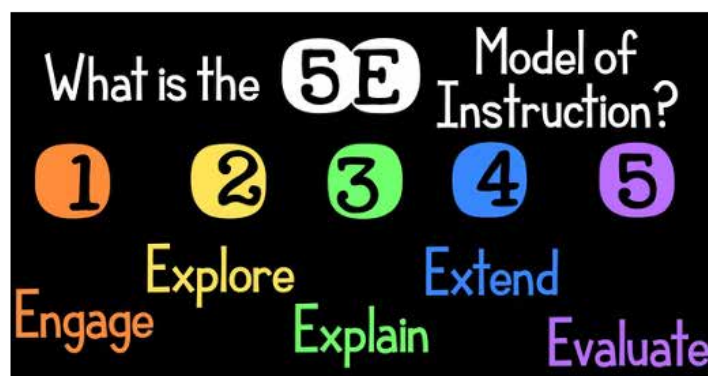
Engage

This is when the topic is introduced to students for the first time. Teachers find out what students already know (or think they know) about the topic and concepts to be covered. Students consider their current ideas and thoughts about the topic. The 'engage' phase should capture students' interest, and make them curious and want to learn more. To use the world of marketing as an analogy, when selling the product, we need to first grab the consumer's attention. Importantly, we won't have their attention unless they have a need to buy the product. They may be unaware of a need. So, in that case, we create that need.

Explore

This is when the students get directly involved. The teacher acts as a facilitator, providing materials and guiding the students' focus, much like what you will be doing on their excursion. The students' inquiry process drives the instruction during an exploration.

Explain

This is when the students puts their experiences (from the explore phase) into a communicable form to give context and meaning to concepts they are learning about. Communication occurs between peers, with the facilitator, or within the learner themself. Students explain their understanding of concepts and the teacher corrects any student misconceptions. In other words, students try to answer all the inquiry questions they were asked.

Elaborate

This is when students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them. Students may conduct additional investigations, develop products, share information and ideas, or apply their knowledge and skills to other disciplines.

Evaluate

This is when the students are assessed on how much they have learned (may be self-assessment). Notably, the evaluation process can also be a continuous one, whereby the learning process is open-ended and open to change. There is an on-going loop where questions lead to answers, but also to more questions and instruction.

Primary school behaviour management

Effective behaviour management underpins almost every teaching and learning success. This makes it essential for teachers and educators to have tools and strategies up their sleeves to ensure behavioural standards are maintained whenever possible. Here are some popular approaches to behaviour management in primary schools.

Use CASPER

- **Calm:** Appear calm, even if you don't feel it. Take a breath and stop to think.
- **Assertive:** Maintain your authority and remember you're in charge. Maintain eye contact.
- **Status preservation:** Reprimand pupils in private, away from their peer group.
- **Empathy:** Try to understand how the pupil is feeling. Avoid asking challenging questions.
- **Respect:** Always show children respect, even if they are being disrespectful. Reinforce your expectations by modelling appropriate behaviour.

Establish a countdown routine

Show students you're prepared to give a little by using a countdown system to call for attention. Rather than abruptly stopping classroom conversations or work on the spot, instead count down from 10 to 1 to give pupils a chance to finish what they're doing and be ready for the next instruction. This is a polite and fair way to establish silence and attention, and acknowledges that some children may need a few seconds to get ready. Students may join in on the countdown and you can use praise to reinforce the importance of adhering to rules.

Set clear expectations

Students have less of a chance to misbehave if they know exactly what is and isn't acceptable in the classroom. In order to create a well-managed, structured classroom environment that caters to a range of different learners and attention spans, you must put in the effort to establish rules, guidelines and expectations. A good set of primary classroom rules, that can be replicated on your vessel, may include:

- We listen to each other and only have one person talking at a time.
- We are quiet by the end of the 10 second countdown.
- We put our hands up before speaking.
- We don't touch each other or each other's things unless we are invited to.
- We take care of our belongings and the classroom's belongings.
- We use kind words to each other.
- We say 'please' and 'thank you'.
- We keep our area tidy.
- We always try our best.

Positive behaviour management

Positive behaviour management is defined as an approach that emphasises prevention, support for students, avoiding confrontation with students and focusing on the development of values, relationships and skills. There is no silver bullet in behaviour management, but a positive approach has been shown repeatedly to have more success than punitive measures. Again, consult the teacher to replicate what happens at school.

Anticipating problems before they occur

Most behavioural problems occur during transitions. When students are seated quietly, and cannot move, you have control. Most problems occur when they are moving from one place to the next, and you have less control. Coordinate a plan with the teacher before moving the students. Importantly, the teacher may have never been on the boat before. They may not know where to go, where things are, or how long it takes to get somewhere. Make sure they have all the information they need, before anyone moves anywhere, so they can be two steps ahead of the students.

- Before moving, ask the students to assemble in one or two lines. Some students will insist they be at the front. You may have to ask them to go to the back of the line (unless you want them at the front to keep an eye on them).
- Beware of pushing and shoving (this is common). Making one or two lines may feel like quite an ordeal at first, but it's better than the alternative.
- After a head count, return to the front of the line, give any last instructions and then start walking.
- As you walk, the line will naturally spread apart. Regularly stop and wait. Students are used to constant stopping. By stopping and waiting, you keep the group together and have more control. If possible, put another adult at the back of the line.
- When reaching your destination, sit them all down. They will need guidance and repeated instruction about exactly where you want them seated. There will always be students who try to sit as far away from you as possible, or as close to you as they can. Direct them where to sit, preferably before they sit down.
- Do another head count.

The teacher will be trying to multi-task, as well as have eyes in the back of their head. It's a big day for them and they will be tired. Think about what to do if the teachers are sea-sick.

Always expect that any problems that can occur, will occur. Play them out in your mind, ahead of time, so you've already thought about how to deal with a problem, should it occur. If it does occur, you already know what to do. Plus, you can put in place procedures to prevent it from occurring in the first place.

Lastly, no-one on board knows the students better than the teachers do. Ask for help if you need it, particularly if you feel someone's behaviour is compromising your ability to teach or maintain a safe learning environment. Teachers manage behaviour problems at school every single day. They are the behaviour experts. Not only did they study it at university, but they live and breathe it every day at work. Do not feel embarrassed to ask them for help. They will not, and should not, expect you to take the reigns when students are misbehaving. Also, students are accustomed to getting instructions and warnings from teachers, not you. However, the teacher won't know your operation. You need to tell them exactly what instructions you want the students to follow, especially the logistics for the day.

Note: most primary school students will be too anxious on-board a boat to step out of line. For this reason, potential behaviour problems on board vessels and management suggestions are listed in the middle school guide.
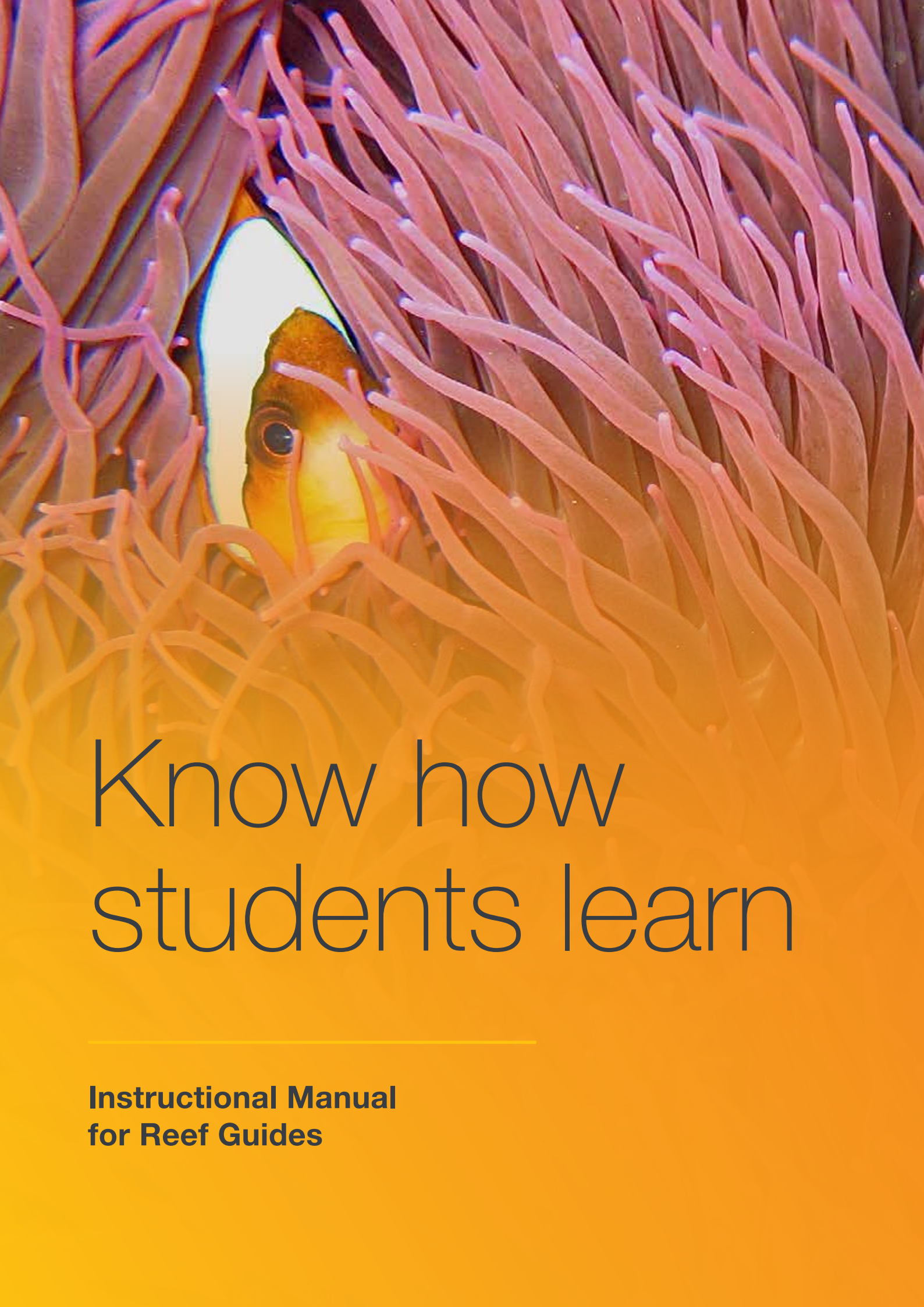
Know how students learn

**Instructional Manual
for Reef Guides**

Students learn best

from their peers

from role models

when expectations and vision are clear

through clear communication

through timely and targeted feedback from peers and leaders

when they are at the edge of their comfort zone

when there is an achievable and satisfying challenge to undertake

when necessary resources are available

when they feel supported

when they are motivated

when there are multiple opportunities to learn

with just in time support

when supported by effective systems and processes

when the learning involves the active construction of their knowledge

through action and experience

with the opportunity to practice more than once

when they are aware of (and committed to) the need to improve

when strategies that are not successful the first time are seen as opportunities to learn more for the future

when learning is delivered in context

when their individual learning style is taken into account

when just enough time is provided (not too little and not too much)

when helped to succeed at making a difference

when they have choice and autonomy

The multi-store model of memory

Conceptual reorganising

Cognitive changes do not result from the mere accumulation of information, but are due to processes involved in conceptual reorganisation. Teachers and educators need to be catalysts for, and mediators of, this conceptual reorganisation. The aim of all instruction is to alter long-term memory. If nothing has changed in long-term memory, nothing has been learned.

The multi-store model of memory

The brain is not a recording device. The neural pathways the brain recruits to process new information are the same neural pathways the brain uses to store that information. Therefore, memories are distributed all over your brain, depending on where they were made. Notably, the sensory storage of a memory lasts only a few seconds. It requires your attention to become a short-term memory. The level or depth of processing of a stimulus has a large effect on its memorability. The memory must be recalled frequently thereafter for those neural pathways to begin to strengthen. Deeper levels of analysis produce more elaborate, longer lasting and stronger memory traces than do shallow levels of analysis. As a rule of thumb, a student must recall or reherse something at least four times, preferably no more than two days apart, to be remembered. That means a teacher must repeat or revisit the same piece of information not once, but four times, if the student has any chance of remembering it. With every recall and rehersal, the neural pathway strengthens more and more, until it eventually transforms into a long-term memory.

Note: there are more theories on how students learn in the middle and senior school guides.

Not surprisingly, the multi-store model of memory follows a similar path to how teachers teach, how students learn, and how the *Be a Marine Biologist for a Day* program is organised into three parts. In Part 1 'preparing to find out', sensory inputs from learning new concepts create new neural pathways in students' brains. As the excitement builds for the excursion, those neural pathways grow bigger and stronger. In Part 2 'finding out', concepts are reinforced and turned into a catalogue of short-term memories. Their day on the reef will be rehersed in their minds for days, weeks and even months to follow. Every rehersal strengthens those neural pathways turning short-term memories into long-term memories. In Part 3 'making connections', teachers ensure students develop a deep understanding of what you taught them, so they remember not only the experience, but all the content as well. Without Part 3, students may remember the experience, or parts of the experience, but forget the content.
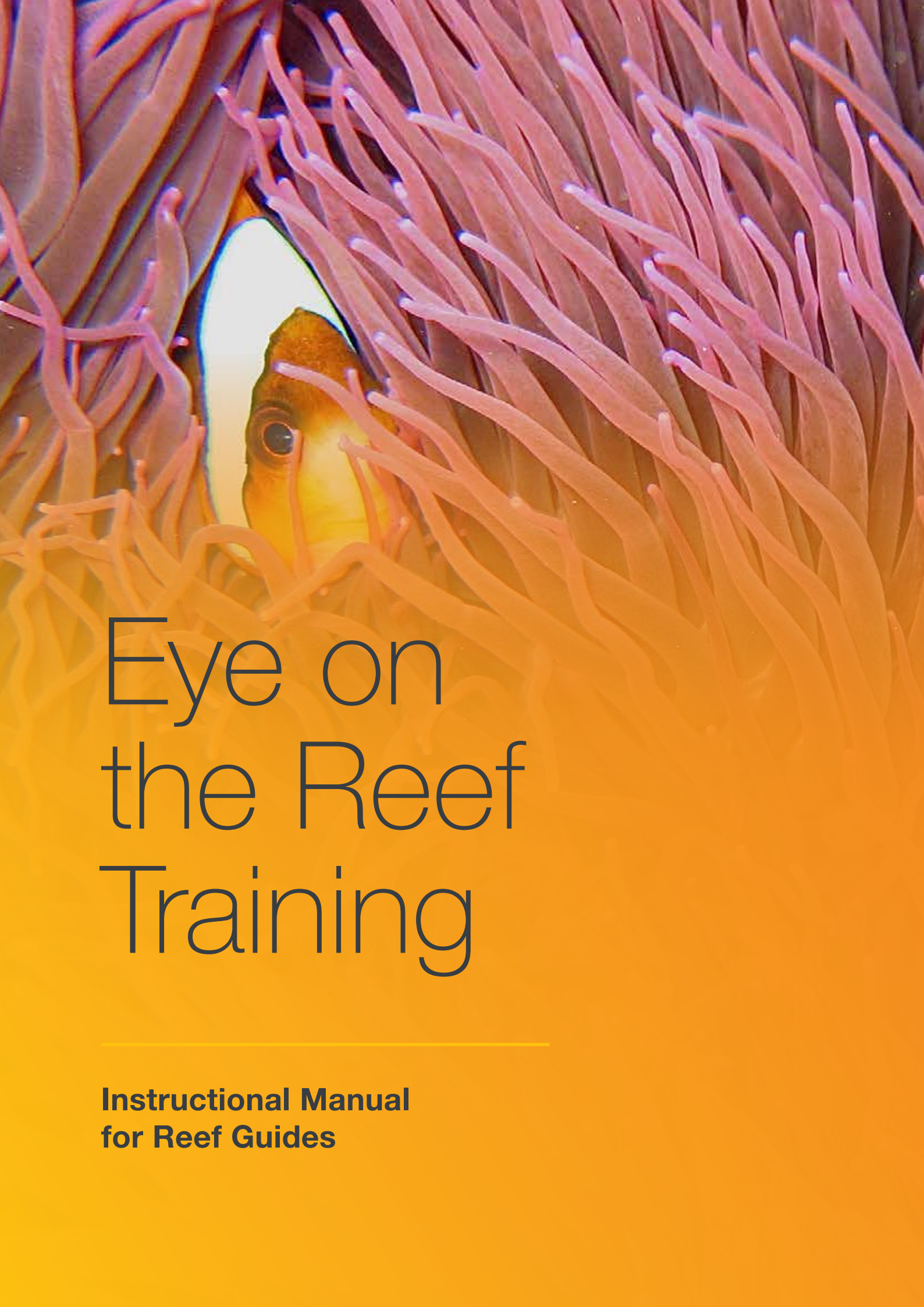
Eye on the Reef Training

**Instructional Manual
for Reef Guides**

Eye on the Reef training

Being a good reef guide is not just about knowing what students need to learn. It is also about you having good knowledge and skills as well.There are a number of online training programs as well as workshops and in-water training opportunities for tourism staff and teachers to complete. Copies of the online training modules are available in PDF as well and can be used to support teacher professional development opportunities as well as training for tourism staff.

Reef Discovery Course

The Reef Discovery Course is a convenient online education package that aims to improve knowledge and understanding of the Great Barrier Reef World Heritage Area, its cultural connections, biological diversity, management and protection, and how best to interpret this information to visitors.

The comprehensive training is a free online course covering the A-Z of all things Great Barrier Reef and how best to share that knowledge with visitors. Designed as a primer by the Great Barrier Reef Marine Park Authority, the course aims to inspire people to learn more about the Reef, how valuable it is and how to deliver accurate information about it in an interesting and memorable way.

To gain access to the Reef Discovery Course, please complete the Eye on the Reef online registration at www.gbrmpa.gov.au or email eyeonthereef@gbrmpa.gov.au.
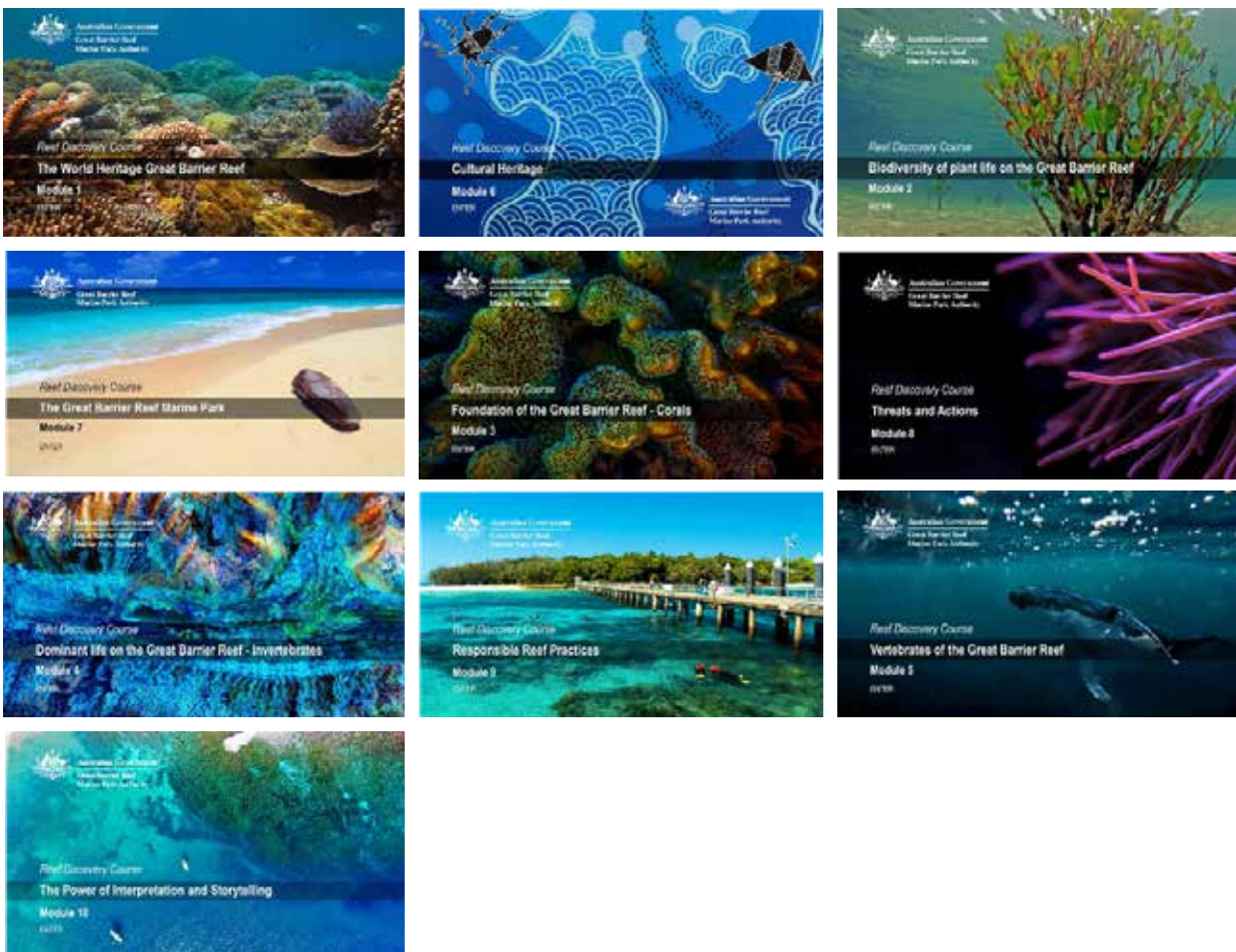
Rapid Monitoring Training

The rapid monitoring survey online training program has six training modules, which include knowledge reviews and short assessment quizzes.

Each module takes up to 30 minutes to complete. Once participants review all modules and quizzes, they are ready to start undertaking surveys and will be added to the rapid monitoring survey team. In order to submit rapid monitoring data, you need to complete the online training and register.

To be part of the Rapid Monitoring Survey team, please complete the Eye on the Reef online registration at www.gbrmpa.gov.au or email eyeonthereef@gbrmpa.gov.au.
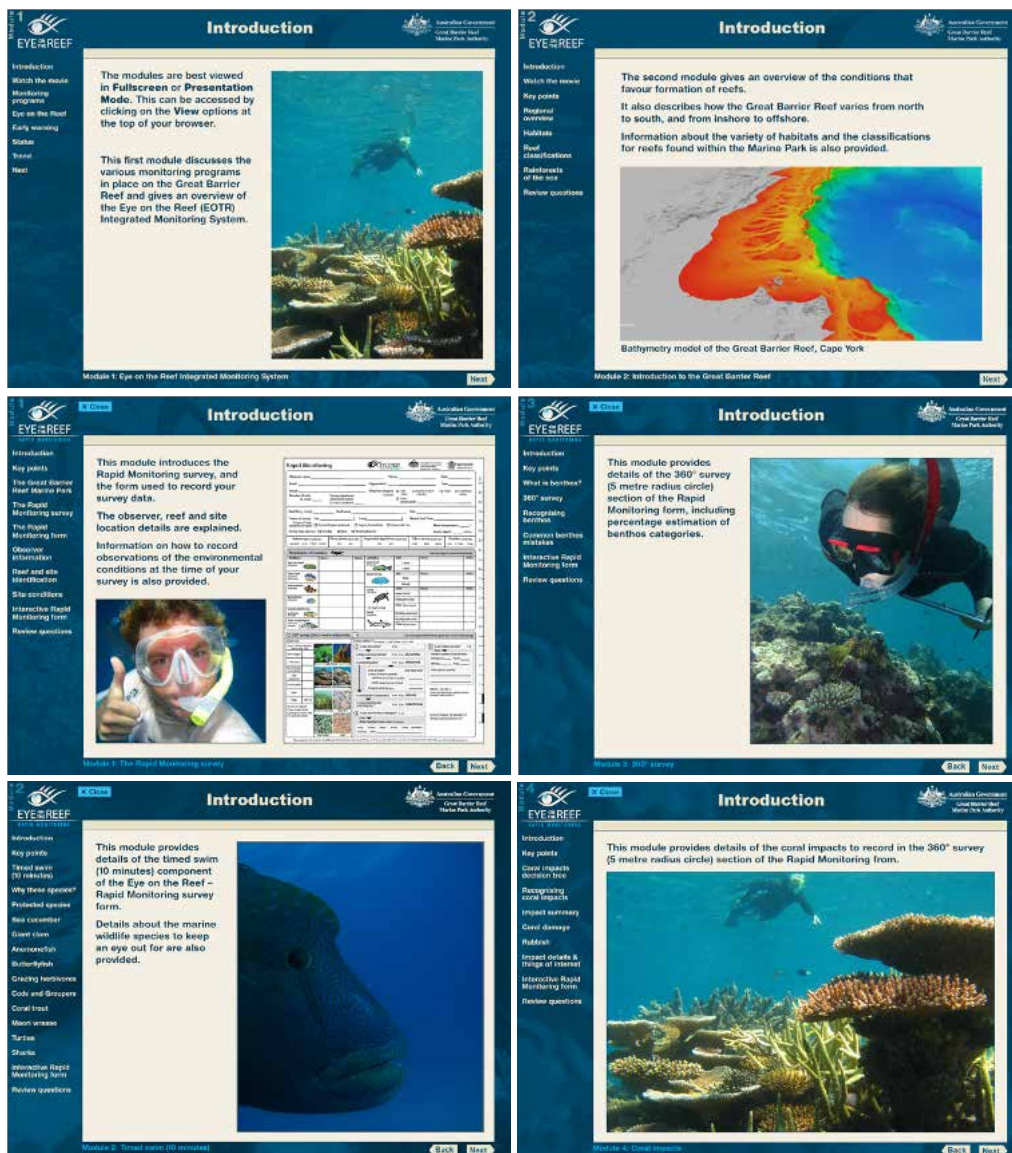
Modified rapid monitoring survey for primary schools

The primary school resources in this toolkit mainly focus on developing students' skills in counting individual species seen in the timed swim section of the rapid monitoring survey. Resources help students learn about these species and why we observe and count them, and provide learning that is curriculum-linked for their year level.

Skills such as animal identification, counting and tallying are critical for primary students participating in these activities. The Rapid Monitoring underwater survey slate has been modified to suit primary schools by focusing on the timed swim methodology and each individual species. Further details on this are outlined in the chapter customising resources for your tourism operation.

Be a Marine Biologist for a Day

Modified rapid monitoring survey for primary schools
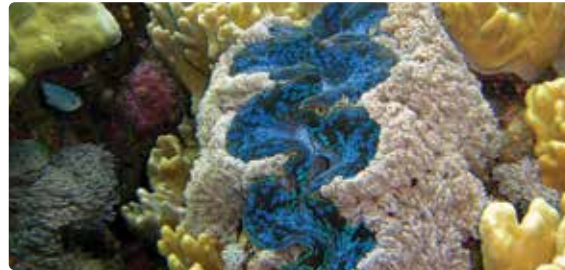
RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority

EYE ON THE REEF

Queensland Government

Timed swim (10 minutes) — *See below for survey methodology*

ANIMALS	TALLY	TOTAL	ANIMALS	SIZE	TALLY	TOTAL
Sea cucumber (all species)			Coral trout (all species)	<38cm		
				>38cm		
Giant clam (larger than size of hand)			Maori wrasse	**SIZE** / Male	**TALLY**	**TOTAL**
				Female		
Anemonefish (all species)			Turtle (all species) * See images below	**SIZE** / Green Turtle*	**TALLY**	**TOTAL**
				Hawksbill Turtle*		
Butterflyfish (all species)				Other (please name)		
			Shark (all species)	**SIZE** / Whitetip reef shark	**TALLY**	**TOTAL**
Grazing herbivores See definition below				Blacktip reef shark		
				Other (please name)		
Cods and groupers (over 50cm in length)			Crown-of-thorns starfish	**SIZE** / Juvenile	**TALLY**	**TOTAL**
				Adult		

25 cm scale (25 down to 0)

Survey guide

Timed swim

▶ Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

GRAZING HERBIVORES

▶ Look for a school of similar looking and sized fish moving slowly along the reef, foraging or grazing close to the coral reef substrate. The most important types to record are species of parrotfish, surgeonfish, rabbitfish and unicornfish.

SEA TURTLES

▶ GREEN

▶ HAWKSBILL

Modified rapid monitoring survey for primary schools

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority | EYE ON THE REEF. | Queensland Government

Timed swim (10 minutes)

Sea Cucumber (all species)

© Commonwealth of Australia GBRMPA

Names

Tally

Total

Survey guide

Timed swim

Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority | EYE ON THE REEF. | Queensland Government

Timed swim (10 minutes)

Giant clam (larger than size of hand)

© Commonwealth of Australia GBRMPA

Names

Tally

Total

Survey guide

Timed swim

Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

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RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority | EYE ON THE REEF. | Queensland Government

Timed swim (10 minutes)

Anemonefish (all species)

© Commonwealth of Australia GBRMPA

Names

Tally

Total

Survey guide

Timed swim

Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority | EYE ON THE REEF. | Queensland Government

Timed swim (10 minutes)

...sh (all species)

© Commonwealth of Australia GBRMPA

Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

Be a Marine Biologist for a Day

Modified rapid monitoring survey for primary schools

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Grazing herbivores

© Commonwealth of Australia GBRMPA

Names

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Cods and groupers (over 50 cm in length)

© Commonwealth of Australia GBRMPA

Names

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Coral trout (all species)

© Commonwealth of Australia GBRMPA

Names

Size

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Maori wrasse

© Commonwealth of Australia GBRMPA

Names

Size

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

Modified rapid monitoring survey for primary schools

Card 1: Turtle

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Turtle (all species)

© Commonwealth of Australia GBRMPA

Names

Size

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

Card 2: Shark

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Shark (all species)

© Commonwealth of Australia GBRMPA

Names

Size

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

Card 3: Crown-of-thorns starfish

RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Timed swim (10 minutes)

Crown-of-thorns starfish

© Chris Jones

Names

Size

Tally

Total

Survey guide

Timed swim
Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

To submit your survey, go to www.gbrmpa.gov.au/eye-on-the-reef | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au

Be a Marine Biologist for a Day
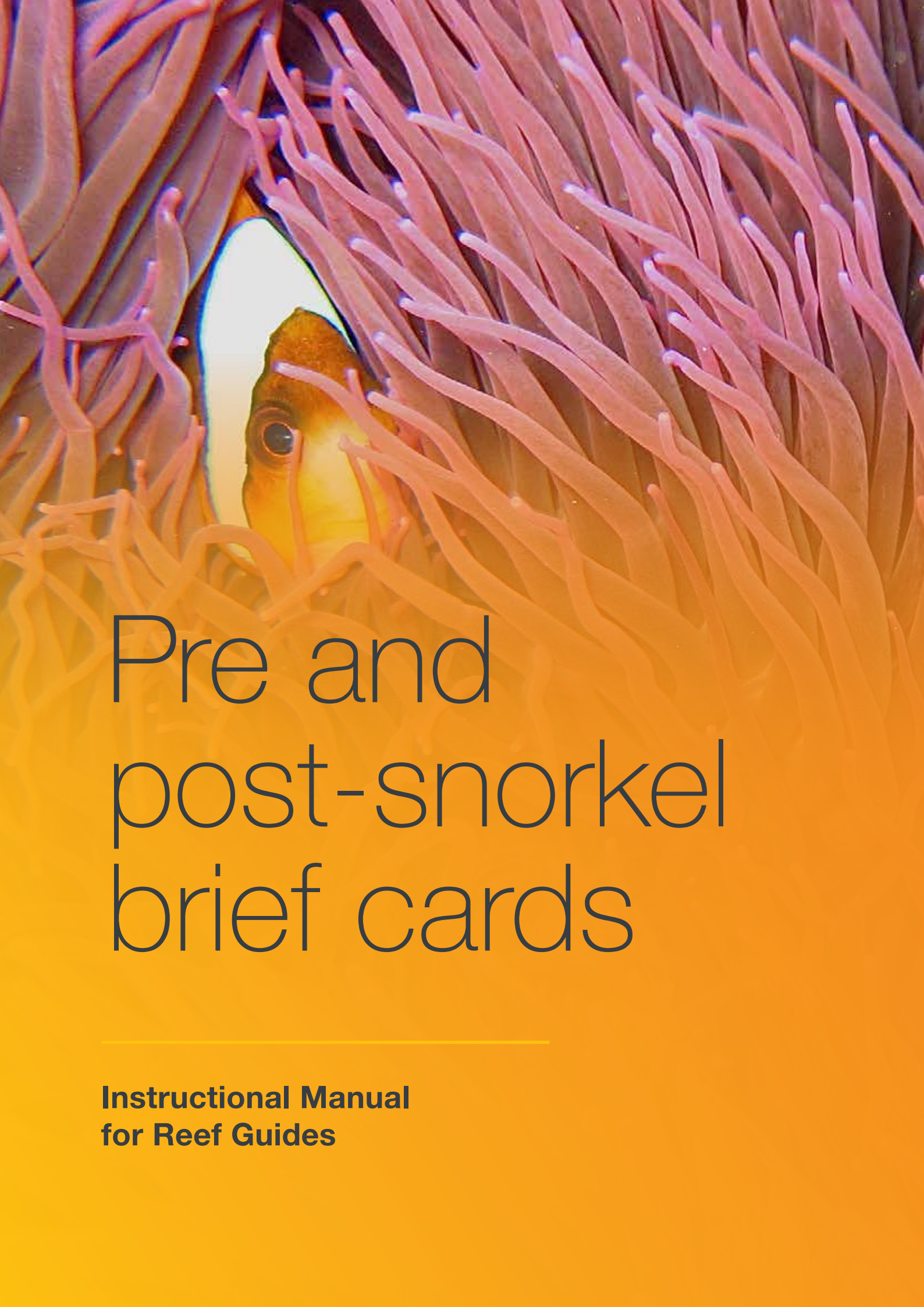
Pre and post-snorkel brief cards

**Instructional Manual
for Reef Guides**

At first, the pre-snorkel brief cards may look a little confusing and you may think they are in the wrong order, but they are not. They are like this on purpose. The pre-snorkel and post-snorkel cue cards are designed to be used as flip books. The students will be seated in front of you. You will be holding the cards up high for everyone to see. The content is repeated on the back of the *previous* card so that you don't need to keep turning them towards you to see what they are. That way, not only can you keep the cards facing the students, but there are questions that you can ask the students. You can feel assured that they are directly related to what the students are learning at school for that particular year level. Remember, this program uses an inquiry-based approach to learning, so your delivery of the content should involve a lot of questioning (as opposed to telling them the information). The inquiry questions will help you with this. The students should already know the answers to the questions if they completed Part 1 at school. If not, they may need you to introduce each species first.

After you have customised the PowerPoint slides to your operation, save them to PDF. Print double-sided on waterproof paper (Officeworks can do this for you) to the size of your liking (A4 is recommended). Alternatively, print double-sided and laminate the pages instead. Punch holes along the top edge of each page. Use a large ring to bind the pages together. The pages must be able to flip easily, without damage.

The age groups are colour-coded. Primary school (P-6) is in orange. Middle school (7-10) is in blue. Senior school (11-12) is in purple. The pre-snorkel and post-snorkel brief cards for the advanced 360° survey are in red.

What the REEF GUIDE is reading from

What the Students are looking at

What the REEF GUIDE is reading from

What the Students are looking at

Be a Marine Biologist for a Day
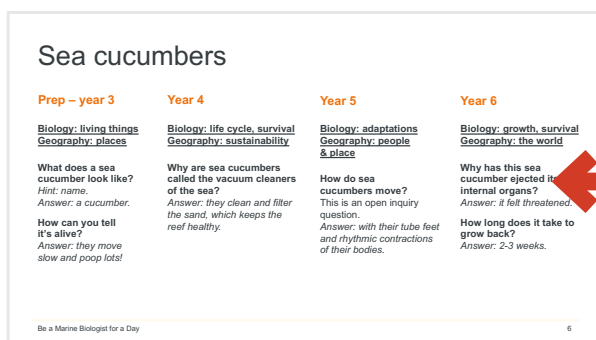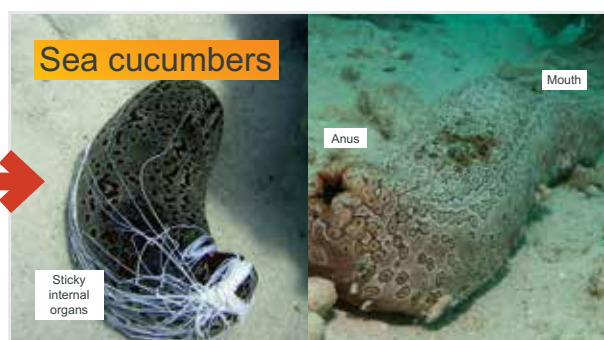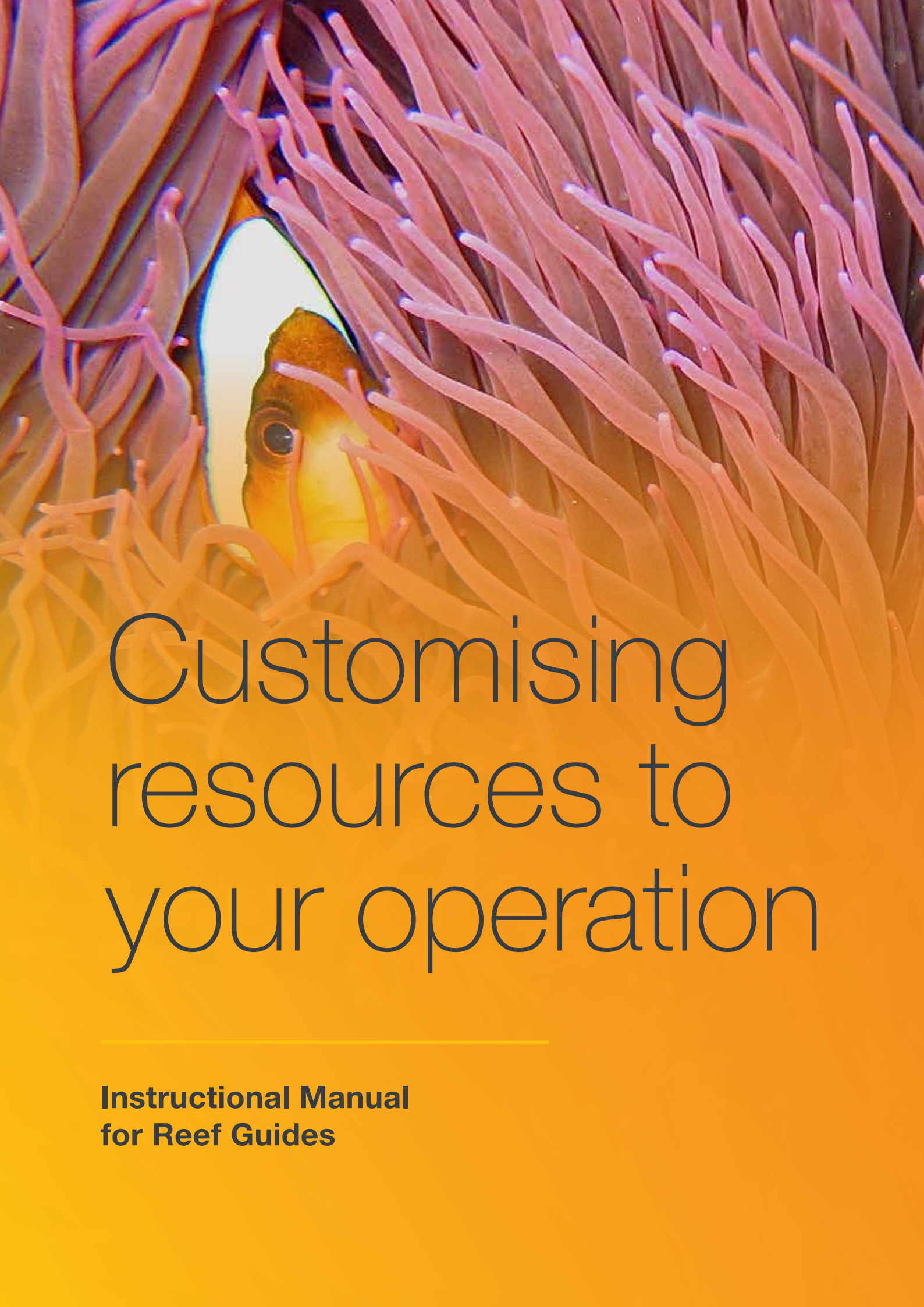
Customising resources to your operation

**Instructional Manual
for Reef Guides**

Part 1: Preparing to find out

Many of the slides in part 1 of the toolkit can be customised to your operation, particularly at the start and end of the PowerPoints. There will either be prompts highlighted in yellow, or prompts in the notes section of each slide. Check both (and delete when finished). Notably, there are a lot of repeated slides between year levels. You may be able to copy/paste an edited slide from one year level to another year level, to save time. If you'd prefer to leave the examples as they are, that is okay too. However, make sure you go through each slide to delete any unwanted prompts/highlights/notes before preparing to send out to schools.
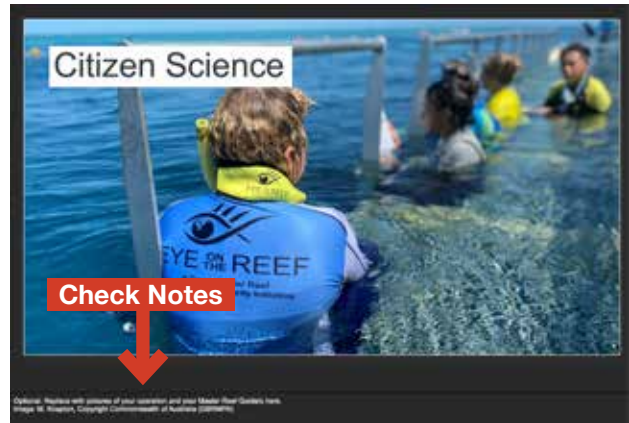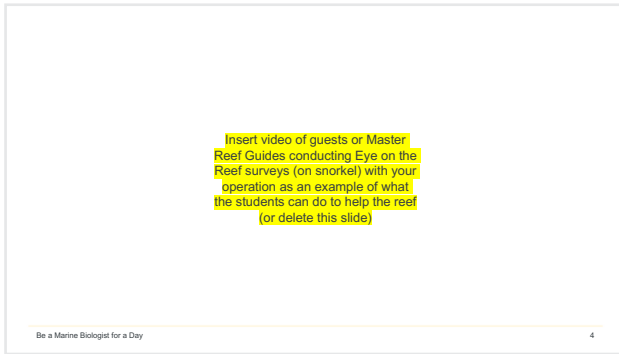
Part 2: Finding out

Pre-snorkel brief cards

Change any pictures to customise to your operation and the animals that reside there.

Add any last comments/instructions on the last slide of the pre-snorkel brief.
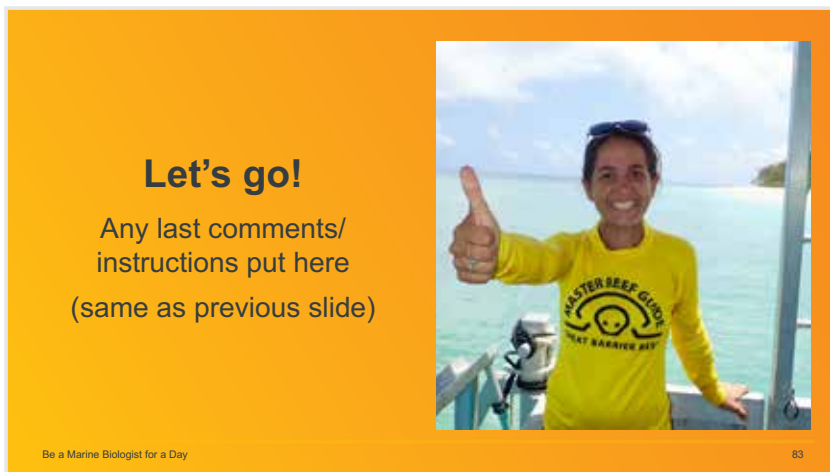
Post-snorkel brief cards

The post-snorkel brief cards for primary school take students through the process of transferring their data from the individual data sheets in their activity books (used to record their tallys) to collating the whole class's data into the middle section of the rapid monitoring survey form (the 10 minute timed swim part only – which they also have in their activitiy books). The first part of the rapid monitoring survey form is NOT in their activity books. However, the teacher should have a master copy to be able to complete that section on their behalf. Therefore, the last slide of the flip book contains all the information the teacher will need to complete that first section. You will need to add details to that last slide or take them through it at the end of the post-snorkel brief presentation.

Part 3: Making connections

No changes are required to the PowerPoints for Part 3.

Activity books

It is recommended that reef guides keep a class set of activity books as spares for schools who forget to bring them. This is highly unlikely, but it is better to be safe than sorry. Alternatively, have some spare rapid monitoring forms they can take home with them. Organise to have plenty of pencils and erasers as well. You don't need to make any changes to the activity books, underline you have changed some of the questions in the PowerPoints. The questions in Parts 1 and 3 are the same as the questions in the activity books.

When making any changes to the activity books, keep in mind that most schools only print in black and white. Colour pictures are likely to be printed in black and white.

Assessment tasks

There is a multi-modal assessment task in Part 3 resources that you do not need to change unless you want to.

Sharing the experience

Asking teachers to share students' work after the excursion will give you a chance to see how students apply what they have learnt. It is always good to follow up to see the impact you have had on these students. They will remember Reef excursions for the rest of their lives, especially if it is the only time they ever go. You will be amazed at how much of an impact you can have on particular students.

You can even ask schools to share photos of their trip on social media or send you some photos (with permission). This makes for good marketing for your tourism operations as well as the school. If you are given any photos or take some of your own, ensure you have permission to publish. Most schools get parents to complete a permission form at the start of the school year that allows their children to be photographed. But do not assume this is always the case. You can ask the schools to share their photos on their social media and tag your company page, so you can re-share the post.

You could even ask for some student testimonials to share on your company's website about the experience. It is also nice to follow up and check what teachers think of the experience. Many teachers will return year after year with the next cohort of students.

Other educational resources

There are many more educational resources available on the Great Barrier Reef Marine Park Authority's website and YouTube channels that are available for use on your vessels or even to share with teachers.

Commonwealth of Australia (GBRMPA). Photographer: D. Wachenfeld.

Be a Marine Biologist for a Day

Final tips and things to consider

Eye on the Reef tourism weekly

Conducting Eye on the Reef tourism weekly monitoring surveys will give you the knowledge and credibility to deliver rapid monitoring surveys with students and other paying guests under the *Be a Marine Biologist for a Day* program. The tourism weekly survey form records reef health indicators, environmental measurements and the presence of protected and iconic species. All of these factors directly relate to specific known concerns about the resilience of the Reef. By taking part in this monitoring program, tourism operators gain detailed knowledge that can help them improve the local management of their site, update reef interpretation tours and tailor products for their visitors.

Eye on the Reef app and sighting network

There are many ways to get involved and everyone's contribution is welcomed — whether you're a regular day-tripper, tourist on their first visit, fisher, Marine Park ranger, marine tourism staff or marine scientist. One of the easiest ways anyone can get involved is by downloading our free Eye on the Reef app to record reef health, animal sightings and incidents. There are also other monitoring programs for people who visit the Reef more regularly, have more time or marine biology knowledge, or are willing to undergo in training.

Master reef guide

All reef guides and staff working on tourism operations along the Great Barrier Reef are critically important to educating Reef visitors. Delivering education experiences to students and improving your knowledge through tourism weekly surveys and the Reef Discovery Course will help you to becoming a great reef guide and educator.

Master reef guides take this to the next level and strive to be world-leading coral reef guides and interpreters, sharing the wonders of the Great Barrier Reef World Heritage Area through engaging stories and memorable experiences. These reef ambassadors can provide up-to-date information on the Reef, share stories of the magical World Heritage Area, and explain what people can do to make a difference.

The Master Reef Guide program is delivered by the Great Barrier Reef Marine Park Authority, Association of Marine Park Tourism Operators, and Tourism and Events Queensland. Master reef guide intakes happen in response to industry demand but you can start working towards becoming a master reef guide so you are ready when the opportunity arises.

COMMUNITY TOOLS

Download the free App

SIGHTINGS NETWORK

Check out who's seen the coolest critters.
Visit: www.gbrmpa.gov.au/sightings-network

WHO IS IT FOR?
Everyone that visits the Reef – daily, weekly, yearly or once in a lifetime

WHAT DOES IT DO?
- Enables all Reef users to report rare sightings and unusual events in real time via a free smartphone app and interactive website
- Contributes to an up-to-date website map of wildlife distribution, which helps to build knowledge about species diversity, abundance, habitat and range
- Provides access to complete Marine Park zoning from your phone
- Allows you to share your wildlife experiences with friends
- Includes key contacts to report incidents

Download the survey form at www.gbrmpa.gov.au

RAPID MONITORING

Want to be a marine biologist for a day?
Do a Rapid Monitoring survey and make your observations count.

WHO IS IT FOR?
Anyone who wants to learn about coral reef biology and then contribute to our knowledge of the Great Barrier Reef

WHAT DOES IT DO?
- Guides you through a standardised assessment of reef health
- Enables the reporting of impacts such as coral bleaching and the presence of crown-of-thorns starfish, anywhere on the Reef
- Increases your awareness of species that play an important role in reef function and evoke wonder from visitors
- Provides a way for the community to give something back to the Reef
- Integrates with other Eye on the Reef surveys

Be a Marine Biologist for a Day

PROFESSIONAL TOOLS

For more information, email
eyeonthereef@gbrmpa.gov.au

TOURISM WEEKLY MONITORING

Tourism staff know their sites better than anyone – this knowledge can help build an overall picture of Reef health.

WHO IS IT FOR?
Dedicated tourism staff

WHAT DOES IT DO?
- Provides long-term trend data about particular Reef sites and early warnings of impacts
- Provides the tools and training to monitor regular sites weekly and build knowledge of the Reef
- Creates and connects a team of trained monitoring professionals, simultaneously providing information for numerous Reef sites
- Provides tourism operators with a biological calendar for their sites, enabling staff to tailor in-water activities and presentations
- Integrates with other Eye on the Reef surveys

For more information, email
eyeonthereef@gbrmpa.gov.au

REEF HEALTH AND IMPACT SURVEY

A scientific surveying tool that provides robust information on the health of a particular Reef

WHO IS IT FOR?
Those with prior marine biology qualifications or experience, or a motivation to learn

WHAT DOES IT DO?
- Provides a snapshot of reef health at any time, on any reef
- Includes a breakdown of habitat and quantifiable impact assessment measures, using a protocol developed by recognised experts
- Adds to a large data set covering over 700 reefs across the Great Barrier Reef
- Aligns with the Australian Institute of Marine Science's Long-term Monitoring Program
- Requires a high degree of training and experience, making it a top-shelf surveying tool to aim for

Reference list

Page 9

Image of learning areas
https://www.australiancurriculum.edu.au/f-10-curriculum/learning-areas/

Icons for cross-curriculum priorities
https://www.australiancurriculum.edu.au/f-10-curriculum/cross-curriculum-priorities/

Icons for general capabilities
https://www.australiancurriculum.edu.au/f-10-curriculum/general-capabilities/

Page 10

Media release from ACARA 2020
https://www.australiancurriculum.edu.au/f-10-curriculum/structure/

Page 12-27

Student work examples – biology
https://australiancurriculum.edu.au/f-10-curriculum/
science/?strand=Science+Understanding&strand=Science+as+a+Human+
Endeavour&strand=Science+Inquiry+Skills&capability=ignore&priority= ignore&elaborations=true

Student work examples – geography
https://www.australiancurriculum.edu.au/f-10-curriculum/humanities-and-social-sciences/hass/

Pages 30 & 38

Image for Australian Teaching Standards
https://teansw.com/australian-teaching-standards/

Page 31

Image for Productive Pedagogies
https://teachingpedagogiesfolio.weebly.com/productive-pedagogies.html

Image for Productive Pedagogies table
http://tashaselearningblog.blogspot.com/2010/07/productive-pedagogies-with-its-four.html

Page 33

Images for the 5 Es
https://nasaeclips.arc.nasa.gov/teachertoolbox/the5e
https://www.whatihavelearnedteaching.com/5e-model-science-instruction/
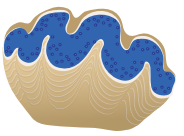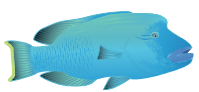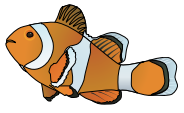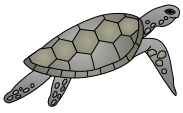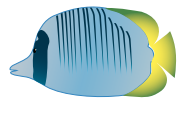
RAPID MONITORING
BE A MARINE BIOLOGIST FOR THE DAY

Australian Government
Great Barrier Reef
Marine Park Authority

EYE ON THE REEF

Queensland Government

Timed swim (10 minutes)

See below for survey methodology

| ANIMALS	TALLY	TOTAL	ANIMALS	SIZE	TALLY	TOTAL
Sea cucumber (all species)			**Coral trout** (all species)	<38cm		
				>38cm		
Giant clam (larger than size of hand)			**Maori wrasse**	SIZE	TALLY	TOTAL
				Male		
				Female		
Anemonefish (all species)			**Turtle** (all species) * See images below	SIZE	TALLY	TOTAL
				Green Turtle*		
				Hawksbill Turtle*		
				Other (please name)		
Butterflyfish (all species)			**Shark** (all species)	SIZE	TALLY	TOTAL
				Whitetip reef shark		
				Blacktip reef shark		
Grazing herbivores See definition below				Other (please name)		
Cods and groupers (over 50cm in length)			**Crown-of-thorns starfish**	SIZE	TALLY	TOTAL
				Juvenile		
				Adult		

Survey guide

Timed swim

▶ Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

GRAZING HERBIVORES

▶ Look for a school of similar looking and sized fish moving slowly along the reef, foraging or grazing close to the coral reef substrate. The most important types to record are species of parrotfish, surgeonfish, rabbitfish and unicornfish.

SEA TURTLES

▶ GREEN

▶ HAWKSBILL

25 cm 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Rapid Monitoring

Australian Government | Great Barrier Reef Marine Park Authority | EYE ON THE REEF | **Queensland** Government

Observer name: _____ **Phone:** _____ **Date:** _____

Email: _____ **Organisation:** _____ **Time:** _____

Vessel: _____ **Observer category** *(tick one)*: ☐ Reef visitor ☐ Marine tourism industry ☐ Fisher ☐ Traditional owner

Number of visits to a reef: _____ **Survey experience** *(approximate number of surveys completed)*: _____ ☐ Other *(please specify)* _____

Reef ID *(e.g. 16-023)*: _____ **Reef name:** _____ **Site:** _____

Centre of survey: **Lat:** _____**S** **Long:** _____**E** **Marine Park Zone:** _____

Tick one GPS type: *(examples over page)* ☐ Decimal Degrees (preferred) ☐ Degrees Decimal Mins ☐ Degrees Min Sec **Water temperature:** _____ °C

Survey type *(tick one)*: ☐ Snorkel ☐ Dive ☐ Viewing bucket **Survey depth:** _____ metres
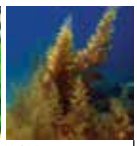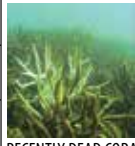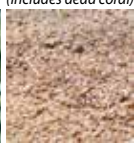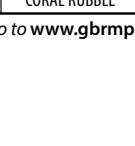
Habitat type *(circle one)*	**Flood plume** *(circle one)*	**Suspended algal bloom** *(circle one)*	**Tide at survey** *(circle one)*	**Visibility** *(circle one)*
LAGOON FLAT CREST SLOPE	YES NO	YES NO	LOW MID HIGH	<5m 5–10m >10m

---

Timed swim (10 minutes)
See over page for survey methodology

ANIMALS	TALLY	TOTAL	ANIMALS	SIZE / SEX / TYPE	TALLY	TOTAL
Sea cucumber (all species)			**Coral trout** (all species)	<38cm		
				>38cm		
Giant clam (larger than size of hand)			**Maori wrasse**	Male		
				Female		
Anemonefish (all species)			**Turtle** (all species)	Green Turtle*		
				Hawksbill Turtle*		
Butterflyfish (all species)			** See images over page*	Other *(please name)*		
Grazing herbivores *See definition over page*			**Shark** (all species)	Whitetip reef shark		
				Blacktip reef shark		
				Other *(please name)*		
Cods and groupers (over 50cm in length)			**Crown-of-thorns starfish**	≤ Size of hand		
				> Size of hand		

☐ 360° survey (One 5 metre radius circle) →
See over page for information guide and survey methodology

BENTHOS

Insert % for each benthos type to total 100%

BENTHOS	%
Macroalgae	
Live coral	
Recently dead coral (white)	
Live coral rock	
Coral rubble	
Sand	
Total	**100 %**

MACROALGAE

LIVE CORAL

RECENTLY DEAD CORAL   CORAL ROCK *(includes dead coral)*

CORAL RUBBLE   SAND

PHOTOS TAKEN
(Please provide details e.g. image no./name, what it is, and a description)

CORAL IMPACTS *(Complete 1, 2 and 3 below. Circle **Y** or **N**)*

① Is any coral white? **Y / N**

Is living coral tissue present? **Y / N** *If yes:* **BLEACHING**

Is coral being eaten? **Y / N** *If yes:* **PREDATION**

If yes, by what? *How many seen?*
Crown-of-thorns starfish
Juveniles *(size of hand or smaller)* _____
Adults *(larger than size of hand)* _____
Drupella snails (all sizes) _____

Is coral banded in appearance? **Y / N** *If yes:* **DISEASE**

Is coral competing with something else? **Y / N** *If yes:* **COMPETITION**

② Is any coral broken or damaged? **Y / N**
If yes:
What is the likely main cause? *(Circle one)*

Storm Animal Vessel Anchor Divers Snorkellers
Unknown Other: _____

③ Is any rubbish present? **Y / N**
If yes:
Number of pieces in survey area:
Fishing line _____ Plastic _____
Netting _____ Rope _____
Other (please specify)
_____
_____

IMPACT DETAILS
(How much bleaching, predation, disease, damage? Other impacts?)

OTHER THINGS OF INTEREST?
(Mating, spawning, behaviour, etc.)

---

*To submit your survey, go to **www.gbrmpa.gov.au/eye-on-the-reef** | Reply Paid PO Box 1379 Townsville QLD 4810 | Fax: (07) 4772 6093 | eyeonthereef@gbrmpa.gov.au*

Survey guide

Timed swim

▶ Spend ten minutes swimming around your survey site, keeping an eye out for key species and other things of interest.

▶ While surveying, use the time to find an area that is representative of the survey site and come back to that area to do your 360° survey.

360° survey

▶ Pick an area which represents the sea bed and overall condition of the site you are surveying. Pick a central point in your selected area which is easy to see and identify.

▶ Swim three body lengths away from that central point and then swim around, surveying the whole area within a circle of 5 metre radius around the central point.

EXAMPLE GPS POSITION

	Latitude	Longitude
Decimal degrees	-18.6582°	146.489°
Degrees decimal minutes	-18° 39.492'	146° 29.34'
Degrees min seconds	-18° 39' 29.52"	146° 29' 20.4"

HABITAT TYPE
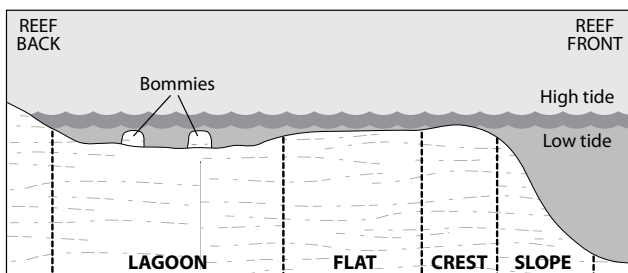
REEF BACK

REEF FRONT

Bommies

High tide

Low tide

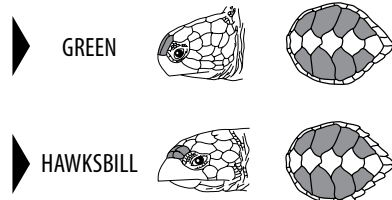LAGOON   FLAT   CREST   SLOPE

GRAZING HERBIVORES

▶ Look for a school of similar looking and sized fish moving slowly along the reef, foraging or grazing close to the coral reef substrate. The most important types to record are species of parrotfish, surgeonfish, rabbitfish and unicornfish.
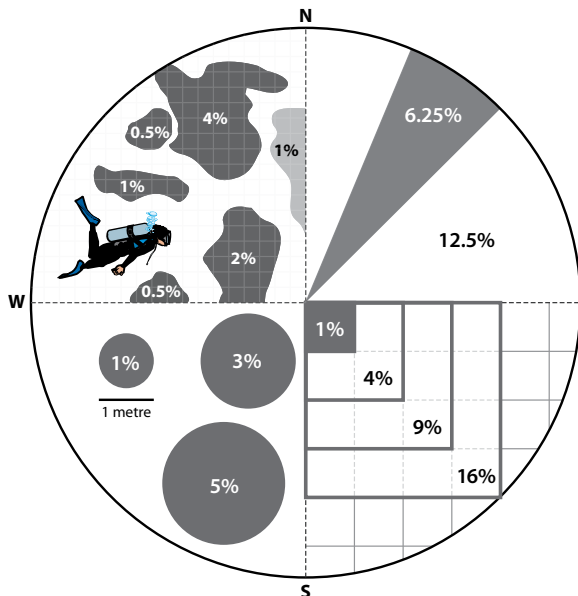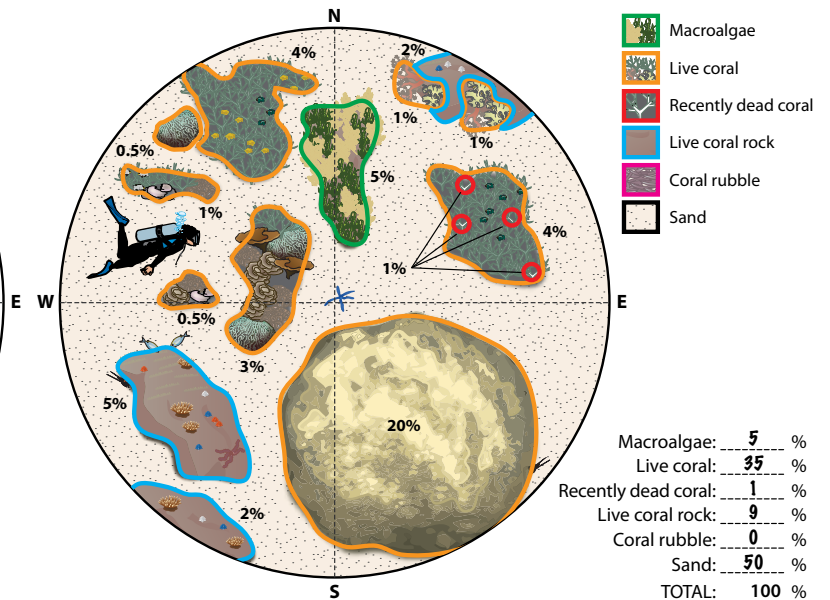
SEA TURTLES

▶ GREEN

▶ HAWKSBILL

CORAL IMPACTS

|← BLEACHING (MINOR) →| BLEACHING (SEVERE)

|← CROWN-OF-THORNS STARFISH →| |← DRUPELLA →|

|← BLACK BAND DISEASE →| BROWN BAND DISEASE   WHITE SYNDROME

|← CORAL COMPETITION →| PIGMENTATION RESPONSE   ALGAL OVERGROWTH

DAMAGE (MINOR)   DAMAGE (MAJOR) |← RUBBISH →|

GUIDE TO ESTIMATING % COVER

N

6.25%

1%

12.5%

4%

0.5%

1%

2%

0.5%

W

E

1%

3%

1%

1 metre

4%

5%

9%

16%

S

EXAMPLE

N

4%

2%

1%

0.5%

1%

5%

1%

4%

W   E

1%

0.5%

3%

5%

20%

2%

S

Macroalgae

Live coral

Recently dead coral

Live coral rock

Coral rubble

Sand

Macroalgae: **5** %

Live coral: **35** %

Recently dead coral: **1** %

Live coral rock: **9** %

Coral rubble: **0** %

Sand: **50** %

TOTAL: **100** %