World Science Festival Brisbane

PRESENTED BY QUEENSLAND MUSEUM

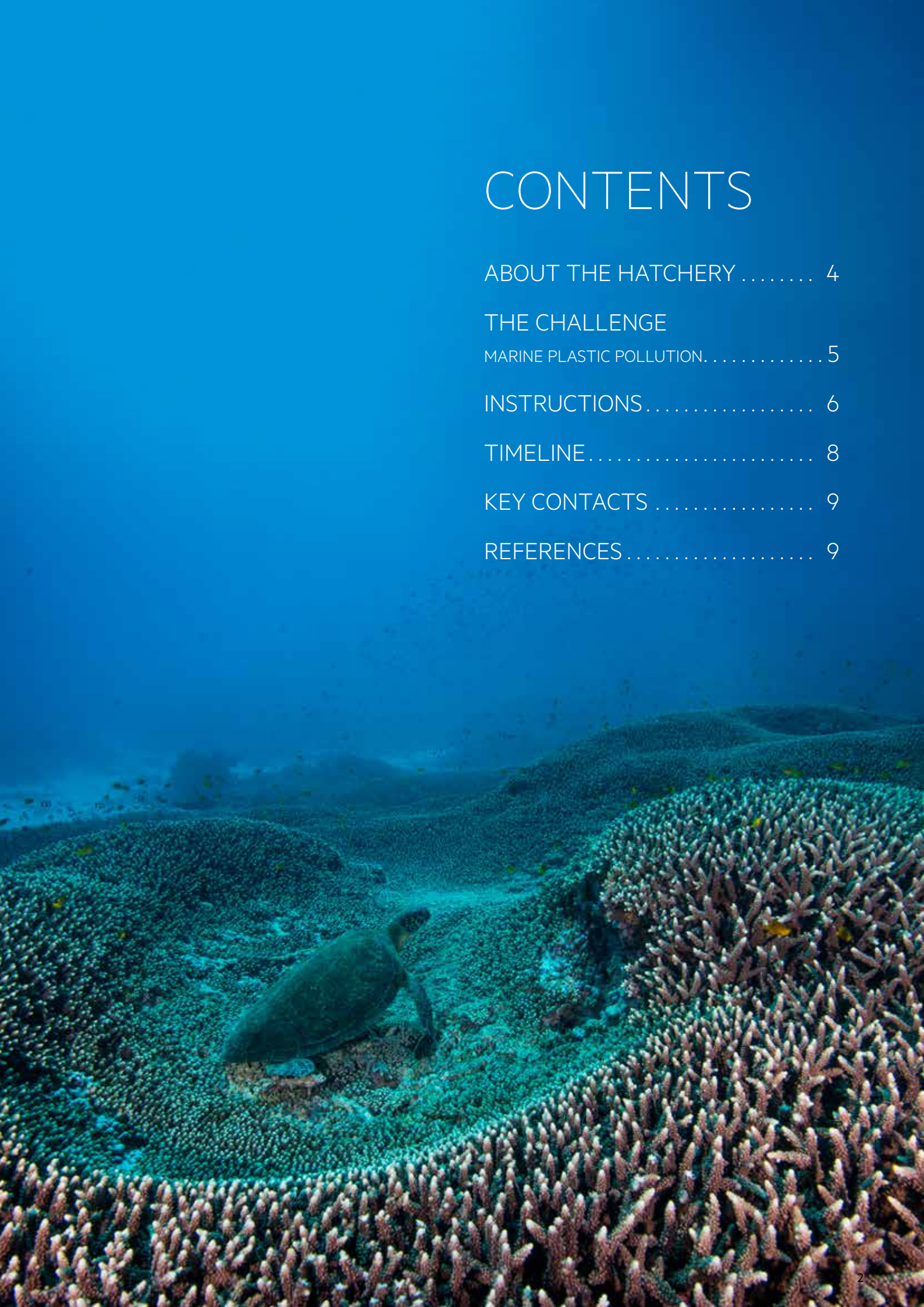
THE HATCHERY CRUSADERS

Teacher Resource

QUEENSLAND MUSEUM

Queensland Government

CONTENTS



ABOUT THIS GUIDE

In 2019, World Science Festival Brisbane will expand its most popular activity THE HATCHERY into an educational program, reinforcing Queensland Museum's commitment to support and foster STEM-literacy.

This extended education program aims to increase students' understanding of marine turtle lifecycles and the effects of plastic pollution.

Using this resource, teachers are encouraged to explore the Key Questions with their students in the classroom.

The outcome of this project is for students, in groups, to produce an installation or artwork using pieces of plastics collected from a local waterway to raise awareness about marine pollution. The plastic collection can be done as a family activity outside of the classroom, or as a school excursion.

Submitted pieces will be showcased during the festival.

ABOUT THE HATCHERY

Let's talk about turtles with Patrick Couper, Senior Curator of Reptiles and Amphibians, Biodiversity Program & Chair of the Animal Ethics Committee, Queensland Museum

What is THE HATCHERY?

The Hatchery is a World Science Festival Brisbane event highlighting the importance of the Mon Repos Loggerhead Turtle rookery as a conservation and ecotourism success story. The event is overseen by Dr Colin Limpus who runs the Queensland Turtle Conservation Project for the Department of Environment and Science. Dr Limpus is a conservation biologist who is recognised as a world authority on marine turtles. The event is undertaken with appropriate permits and is approved by an Animal Ethics Committee.

Will the hatchlings return to Mon Repos?

After the festival, the Loggerhead Turtle hatchlings will be released in south-east Queensland, 20 km offshore into the Eastern Australian Current. This is where they begin the open ocean phase of their life history. The hatchlings imprint to the Earth's magnetic field but the precision of this imprinting is not at a scale that enables them to imprint on a specific beach. If the hatchlings survive to maturity, they will return to breed on a suitable beach on the South-east Queensland coast. Some may even return to nest at Mon Repos.

Why is this event important?

The World Science Festival Brisbane Hatchery plays a vital role in highlighting the important research undertaken by the Queensland Turtle Conservation Project and shows that long-term monitoring is essential for managing marine turtle populations.

How many eggs will there be in The Hatchery?

The Hatchery will feature Loggerhead Turtle eggs collected from the world famous Mon Repos rookery. Around 300,000 eggs are currently laid on the beaches of the Bundaberg coast during the nesting season.

Guidance Questions:

1. Loggerhead Turtles have structural and behavioural adaptations that enable them to survive in their marine environment. Explain some of these adaptations and how they would assist a turtle to survive.

2. Describe the feeding and nesting habitats of the Loggerhead Turtle.

4. Create a food chain and food web involving the Loggerhead Turtle.

5. Why are Loggerhead Turtles listed as an Endangered Species? What are some of the things we can do as individuals to 'protect' Loggerhead Turtles?

THE CHALLENGE

MARINE PLASTIC POLLUTION

Most plastics are made from synthetic polymers through various chemical reactions using oil as a raw material. Plastics are incredibly versatile materials; they are inexpensive, lightweight, strong and durable, making them a popular and integral material for many products[1]. By 2020, the global production of plastics will exceed 300 million tonnes and account for more than 8% of the world's oil production[2].

Plastics are now recognised as a major problem for marine animals. Numerous accounts of animals ingesting or becoming entangled in plastic have been documented, with these encounters typically resulting in injury or impaired movement and often resulting in death[3].

Plastics have a particularly large impact on marine turtles and seabirds which commonly ingest floating plastic or become entangled in plastic debris. It is currently estimated that around 8 million tonnes of plastic enters the ocean annually. Plastic in the environment doesn't go away, it just breaks down into smaller and smaller pieces. Toxins from ingested plastics accumulate in the tissues of marine creatures [4] and are transferred into the food chain.

GUIDANCE QUESTIONS:

1. How do plastics get into our oceans?
2. What can we do as individuals to reduce plastic pollution?
3. What can we do as a community to reduce plastic pollution?
4. Identify organisations and community groups addressing the plastics problem and raising public awareness on this issue.
5. Describe the difference between Macroplastics, Microplastics, Microbeads and Nanoplastics and how they can be harmful to our marine life.

[1] Andrady & Neal 2009
[2] Thompson et. al. 2009
[3] Gregory 2009
[4] Hawxhurtst 2001

INSTRUCTIONS

1. Register your school's participation by filling out the **online form** or email **wsfbeducation@qm.qld.gov.au**
2. WATCH Patrick Couper at Mon Repos rookery **https://www.youtube.com/watch?v=4gDG7eFmPdM**
3. Recap the environmental consequences of plastic waste and discuss how humans can reduce the impacts of plastic pollution (using Student Questions as guides);
4. As a family activity outside the classroom or as a school excursion, collect plastics from a nearby waterway – for example your local creek or beach (if this is not possible then something from home) – and bring this back to class;
5. Collected plastics to be deposited in a central collection point in schools;
6. As a group or solo activity, students are to perform a show-and-tell about their collected items using the KEY QUESTIONS;
7. In the classroom use the collected plastics to create a piece of artwork that raises awareness about the problem of plastic pollution in waterways, either as a whole class, or in smaller teams. The artwork can take any form, for example a sculpture, poster or collage but must use the collected materials;
8. Submit a photograph of one artwork per school via email to wsfbeducation@qm.qld.gov.au.

The finalist artworks will be showcased during the World Science Festival Brisbane Festival in March 2019, with the winning school having first priority entrance to The Hatchery during World Science Festival Brisbane in March 2019.

After the festival, students will reuse their artworks by reimagining the pieces of art in other contexts; follow-up conversations will be encouraged with guidance from WSFB staff.

Please visit our website for Terms and Conditions of entry **http://www.worldsciencefestival.com.au/hatchery-crusaders-war-plastics/**

KEY QUESTIONS

Ask your students to choose one or more pieces of plastic and discuss:

YEAR 4 and 5

The properties of the plastic item, what it was used for, and how the plastic could potentially harm marine animals in various stages of their life cycles.

YEAR 5 and 6

If and how the collected piece of plastic can be recycled or reused.

YEAR 7

How the collected plastic can move through food chains/webs and possibly impact ecosystems

CURICULUM LINKS

	Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Year 4	Biological sciences Living things have life cycles (ACSSU072)	Nature and development of science Science involves making predictions and describing patterns and relationships (ACSHE061)	Questioning and predicting With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge (ACSIS064)
	Chemical sciences Natural and processed materials have a range of physical properties that can influence their use (ACSSU074)	Use and influence of science Science knowledge helps people to understand the effect of their actions (ACSHE062)	Communicating Represent and communicate observations, ideas and findings using formal and informal representations (ACSIS071)
Year 5		Use and influence of science Scientific knowledge is used to solve problems and inform personal and community decisions (ACSHE083)	Questioning and predicting With guidance, pose clarifying questions and make predictions about scientific investigations (ACSIS231)
			Communicating Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSIS093)
Year 6	Chemical sciences Changes to materials can be reversible or irreversible (ACSSU095)	Nature and development of science Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (ACSHE098)	Communicating Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSIS110)
Year 7	Biological sciences Interactions between organisms, including the effects of human activities can be represented by food chains and food webs (ACSSU112)	Nature and development of science Science knowledge can develop through collaboration across the disciplines of science and the contributions of people from a range of cultures (ACSHE223) Use and influence of science Solutions to contemporary issues that are found using science and technology, may impact on other areas of society and may involve ethical considerations (ACSHE12)	Questioning and predicting Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124) Planning and conducting Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS125) Evaluating Use scientific knowledge and findings from investigations to evaluate claims based on evidence (ACSIS132) Communicating Communicate ideas, findings and evidence based solutions to problems using scientific language, and representations, using digital technologies as appropriate (ACSIS133)

KEY DATES

16 August 2018 – Program Launch
20 August to 3 December 2018 (Terms 3 & 4) – Collection and artwork development
7 December 2018 – Final date for artwork submission
Early-February 2019 – Finalists notified
March 2019 – World Science Festival Brisbane

SUGGESTED TIMELINE

	TERM 3						HOLIDAYS		TERM 4										
	13/08	20/08	27/08	3/09	10/09	17/09	24/09	1/10	8/10	15/08	22/10	29/10	5/11	12/11	19/11	6/11	31/11	3/12	2019
NATIONAL SCIENCE WEEK - Program Launch	THURSDAY 16 August																		
WATCH VIDEO AND PLASTIC COLLECTION																			
HOLIDAY BREAK																			
PLASTIC COLLECTION - SHOW AND TELL																			
ARTWORK DEVELOPMENT/ SUBMISSION																			
FINAL DATE FOR ARTWORK SUBMISSION – Judging commences																		FRIDAY 7 December	
WINNER ANNOUNCEMENT																			EARLY FEBRUARY

KEY CONTACTS

Maho Go

07 3842 9703

maho.go@qm.qld.gov.au

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Quarterly newsletters feature updates on school programs, classroom resources, teacher professional development, new Queensland Museum exhibitions and more.

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