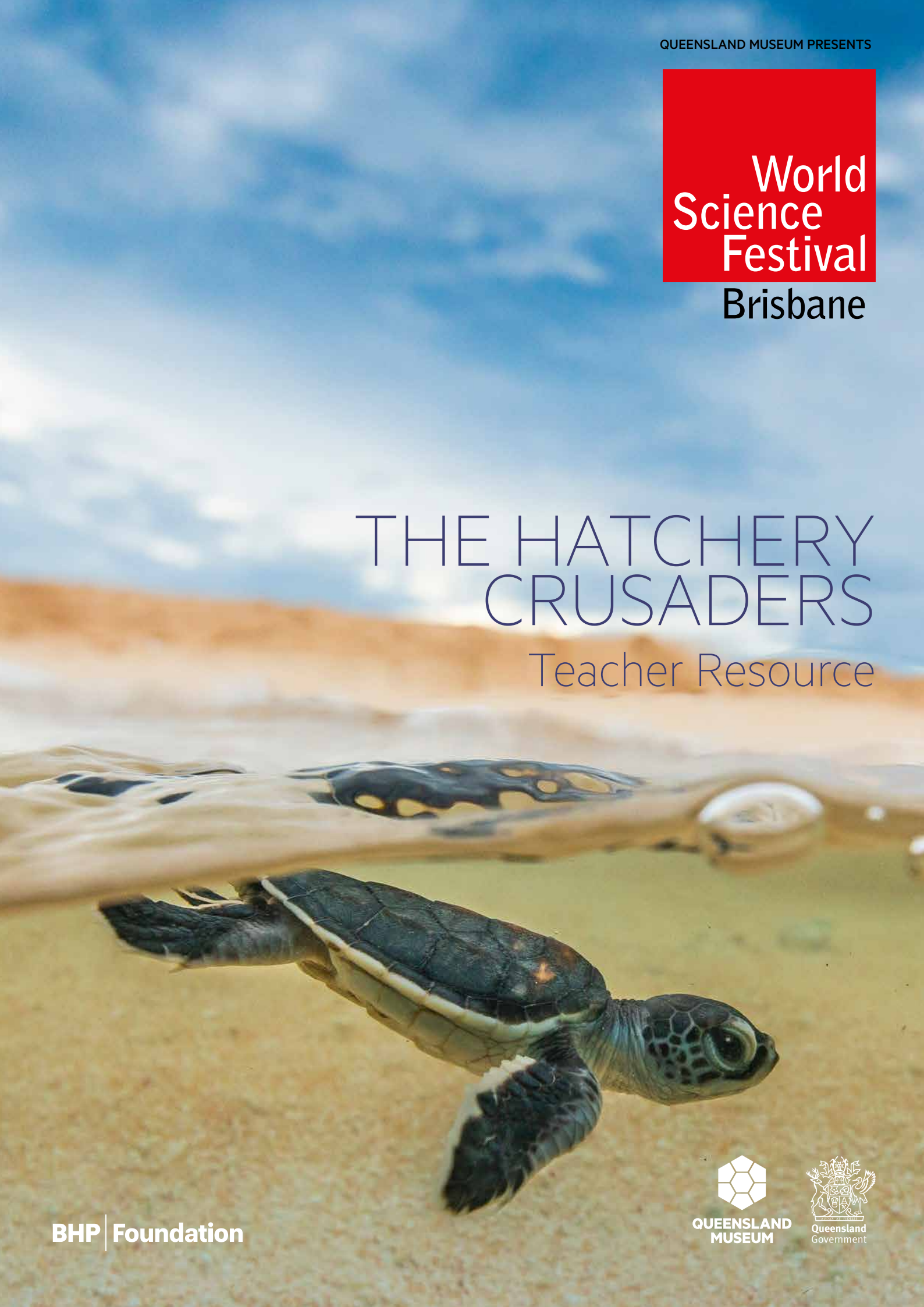
QUEENSLAND MUSEUM PRESENTS

World Science Festival Brisbane

THE HATCHERY CRUSADERS

Teacher Resource



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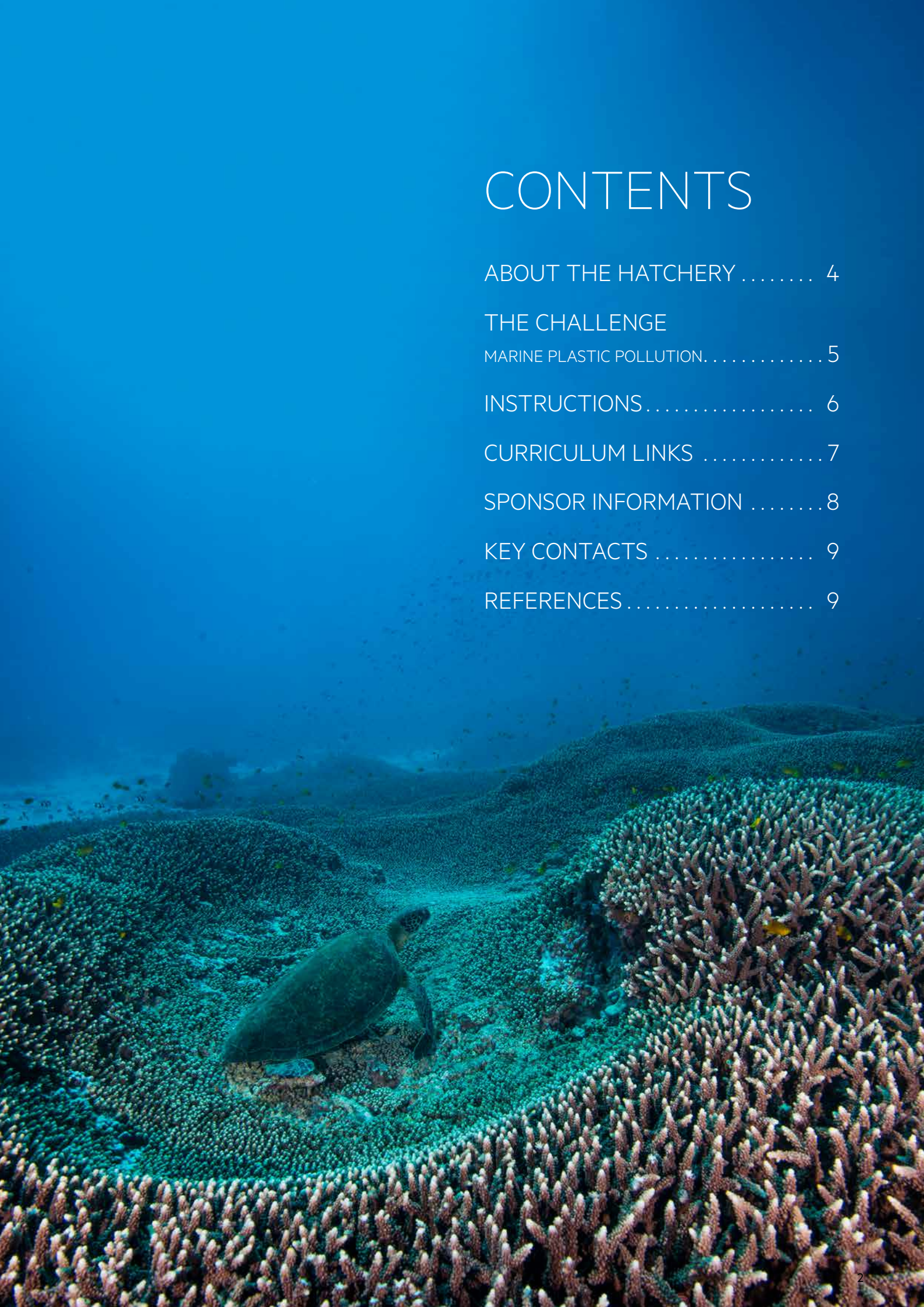

ABOUT THIS GUIDE

In 2020, 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.

The finalist artworks will be showcased during the World Science Festival Brisbane in March 2020 at a Queensland Museum to raise public awareness about the plight of marine turtles.

The winning school will have a special opportunity to name one of our turtle hatchlings, as well as first priority entrance to THE HATCHERY during World Science Festival Brisbane in March 2020.

ABOUT THE HATCHERY

FROM OUR TURTLE EXPERT

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 Mon Repos Loggerhead Turtle rookery as an important conservation and ecotourism success story. During the festival turtle eggs collected by experts at Mon Repos are hatched in a specially designed facility at Queensland Museum that is open to the public. The event is overseen by Dr Colin Limpus who runs the Queensland Turtle Conservation Project for the Department of Environment and Science and 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?

The turtle hatchlings might indeed return to nest at Mon Repos. After the festival, the hatchlings will be released directly into the Eastern Australian Current to begin the open ocean phase of their life cycle, 20 km offshore from South East Queensland and not far from where they were collected. Loggerhead Turtles imprint geographically according to Earth's magnetic field, although the precision of this imprinting is not at a scale that leads them to a specific beach. Therefore, on reaching maturity the surviving turtles will return to breed on a suitable beach somewhere along the South East Queensland coast.

Why is this event important?

World Science Festival Brisbane's THE 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.

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.
3. Create a food chain and food web involving the Loggerhead Turtle.
4. 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 **https://marcatoapp.com/forms/https-wsfb2020/hatchery_crusaders/new** 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 2020, 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

KEY DATES

28 November 2019 – Registrations close

Terms 3 & 4 2019 – Collection and artwork development

5 December 2019 – Final date for artwork submission

February 2020 – Finalists notified

March 2020 – World Science Festival Brisbane

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)

QUEENSLAND MUSEUM'S WORLD SCIENCE FESTIVAL BRISBANE

Queensland Museum presented the first World Science Festival Brisbane in 2016, with the support of the Queensland Government. Queensland Museum Network holds the exclusive licence to host World Science Festival in the Asia Pacific until 2021. The only global extension of this hugely popular initiative, World Science Festival Brisbane reinforces Queensland Museum's position as a leader in Science, Technology, Engineering and Mathematics (STEM) education and engagement.

Brisbane's Cultural Precinct comes alive for five days during March as World Science Festival Brisbane brings together some of the greatest thought leaders, showcasing local scientists and performers from around the globe.

Queensland Museum Network

Queensland Museum is custodian of the state's natural and cultural heritage, caring for more than a million items and specimens in collections that tell the changing story of Queensland. We deliver museum services across the state, through a network of public museums including The Workshops Rail Museum, Ipswich, Cobb+Co Museum, Toowoomba and Museum of Tropical Queensland, Townsville.

We aim to connect visitors to Queensland, its people and Queensland's place in the world - past, present and future, through exhibitions, displays and public programs. Behind the scenes, the Museum is home to millions of objects, specimens and artefacts that tell the changing story of Queensland.

BHP FOUNDATION

The BHP Foundation works to address some of the most critical global sustainable development challenges facing our generation.

By working in partnership with others it seeks to raise the bar, find new solutions and set new standards for the future.

The BHP Foundation is a charity funded by BHP, a leading global resources company, and through its programs it addresses challenges that are directly relevant to the resources sector.

Since 2017 the BHP Foundation has supported World Science Festival Brisbane as exclusive Street Science Partner, creating a science playground full of immersive and family-friendly events. Science is exciting and everyone should get to participate in exploring the world around us. We are pleased to extend this partnership to include THE HATCHERY CRUSADERS to raise awareness of this important environmental issue and bring science even closer to home.

BHP Foundation's support for environmental resilience in Australia goes further. In partnership with the Great Barrier Reef Foundation, the Resilient Reefs project aims to improve outcomes for the world's coral reefs and the communities they support. This world-leading project will have global impact, helping reef managers internationally to assess and prioritise reef threats and challenges, and then implement strategies for climate change resilience planning. Resilient Reefs funds resilience planning, capacity building and implementation in the five pilot sites of World Heritage listed coral reefs: Australia's Great Barrier Reef and Ningaloo Reef, Palau's Rock Islands, the Belize Barrier Reef, and the Lagoons of New Caledonia.

KEY CONTACTS

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For quarterly newsletters feature updates on school programs, classroom resources, teacher professional development, new Queensland Museum exhibitions and more visit our website: **www.qm.qld.gov.au.**

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