Teacher Notes

Themes

- Sharks
- Citizen science
- Marine conservation
- Observation and data collection

Key learning outcomes

- Explain what a citizen science project is and how it contributes to conservation.
- Identify different types of shark egg cases and describe their unique features.
- Apply safe and ethical fieldwork practices when exploring natural environments.
- Record and interpret simple observational data to support scientific investigations.

Key curriculum areas

- **Science:** Science Understanding (Biological sciences); Science Inquiry; Science as a Human Endeavour
- **English:** Language; Literature; Literacy
- **HASS:** Geography; Skills
- **Cross-curriculum Priority:** Sustainability

Publication details

The Great Shark Egg Case Hunt

ISBN: 9781486318308

Teacher notes prepared by David Benton.

CSIRO Publishing
Private Bag 10
Clayton South, VIC 3169, Australia

Website: www.publish.csiro.au
Tel: 1300 788 000 (local call in Australia)
Email: publishing.sales@csiro.au

The Great Shark Egg Case Hunt

Kasey Whitelaw and Sylvia Morris

About the book

It's time to go on an egg hunt. But not a chocolate egg hunt, or a chicken egg hunt – we're going on a shark egg case hunt!

Some sharks and their close relatives lay eggs, which are protected in egg cases that come in lots of shapes and sizes. Once a baby shark has wriggled out, these egg cases wash up on beaches around the world just waiting to be found.

Join our citizen scientists as they enjoy a day at the beach and discover some weird and wonderful shark egg cases. You may even be inspired to become an egg case hunter yourself!

Recommended for

Readers aged 5 to 9 (Years 1 to 4)

CSIRO PUBLISHING

Teacher Notes

About the author and illustrator

Kasey Whitelaw is a marine biologist, educator and children's writer. She has an interest in connecting children to science and nature, sparking their wonder and curiosity through storytelling and education.

Sylvia Morris is an illustrator and science enthusiast. She loves illustrating picture books because it combines two of her favourite activities: reading and problem solving. She is also the illustrator of *The Opal Dinosaur*.

Pre-reading questions or activities

How do you think sharks reproduce? Do they lay eggs or give birth to live young?
Actually it is both! Many shark species are viviparous (give birth to live young) and many are oviparous (lay eggs).

Why might people want to hunt for shark eggs?

Discussion questions

Science

1. What is the purpose of the Shark Trust's Great Eggcase Hunt citizen science project?

   To record and identify shark egg cases to map species distribution and support conservation.

2. Which do you think appeared on Earth first: sharks, dinosaurs or whales?

- *Whales evolved from four-legged creatures similar to large dogs around 50 million years ago (https://www.sciencedaily.com/releases/2006/05/060523092737.htm).*
- *Dinosaurs first appeared around 230 million years ago (https://www.nhm.ac.uk/discover/where-did-dinosaurs-come-from.html)*
- *Sharks have existed for over 400 million years! That's right, sharks are even older than dinosaurs. Today, sharks and their relatives occupy all the oceans of the world (https://www.sharktrust.org/).*

3. Why should you leave underwater egg cases undisturbed?

   Because baby sharks may still be developing inside. Moving the egg could damage or even kill the developing shark inside.

4. Why is it so important that we protect sharks?

   They regulate food webs and support biodiversity – they are vital to the balance and health of our oceans. If we lose sharks, we also lose important habitats that provide oxygen for us to breathe and food for people to eat.

English

1. Find three descriptive words or adjectives used in the text. How do they help you imagine the egg cases or beach scene? *For example, 'strange', 'camouflaged', 'kaleidoscope'.*

HASS

1. Why is citizen science so important, and how can citizen scientists share their data with researchers?

   Encouraging citizen scientists means that a large amount of data can be collected – a great deal more than the scientists in charge of an investigation could get by themselves.

   For the Great Eggcase Hunt, citizen scientists can upload photos and observations to the recording hub on the Shark Trust's website (https://www.sharktrust.org/geh-record) or through the Shark Trust App (https://www.sharktrust.org/app).

Sustainability

1. What can we do to reduce harm to beaches and marine life while hunting for egg cases?

   Take rubbish home, wear eco-friendly gear and avoid trampling habitats.

Activities

Science

Make use of the videos on sharktrust.org

The Shark Trust website has some great introduction videos to sharks and their importance in nature: https://www.sharktrust.org/pages/category/shark-shorts. Lead class discussions using the prompts below and the corresponding videos.

a) What makes sharks different from other fish?

Video: 'What is a Shark?', https://www.sharktrust.org/what-is-a-shark

Some key information (not all of which is included in the video):

- Skeleton made of cartilage, not bone
- No swim bladder (use liver oil for buoyancy)
- Skin covered in tiny tooth-like scales (dermal denticles)
- Multiple rows of replaceable teeth
- Exposed gill slits (usually 5–7)
- Some species have internal fertilisation, and typically give birth to fewer, more developed young
- Excellent sense of smell and electroreception

b) Draw what you think a shark looks like. Do all sharks look like this?

Students could describe or draw what they think a shark looks like. Then have them watch the video to see the wide variety of shark species.

Video: 'Comparing Sharks', https://www.sharktrust.org/comparing-sharks

c) How important are sharks?

Video: 'Caring for Sharks', https://www.sharktrust.org/caring-for-sharks

Some key information (not all of which is included in the video):

- Top predators that keep marine food webs in balance
- Help control populations of other species
- Remove sick and weak animals, keeping prey healthy
- Support ocean health and biodiversity
- Some species help cycle nutrients through movement
- Healthy shark populations indicate a healthy ecosystem

Excursion ideas: take part in the Great Eggcase Hunt!

An incredible follow-up for this book would be to have students take part in their own shark egg case hunt. If your school is on or near the coast, do some research into which areas are likely to have egg cases wash up on shore. Some tips for increasing your chances of finding egg cases:

- Visit beaches near rocky reefs or seagrass beds (sharks often lay eggs nearby).
- Look in the strandline (where seaweed and debris collect) as well as at the back of the beach (in the grasses of sand dunes).
- Search after high tides or storms (more likely to wash up egg cases).
- Check among seaweed clumps and driftwood.
- Go to quieter, less-trampled beaches for better chances.
- Coastal areas near marine parks or reserves may have more egg cases.

Remember to watch where you walk so that you don't trample the surrounding vegetation. For more information, visit: https://www.sharktrust.org/greateggcasehunt

English

Creative writing: the perfect spot

Imagine you are a shark and you want to choose the best place to lay your egg. Write a story about searching for and finding the perfect spot. Use *The Great Shark Egg Case Hunt* to find some descriptive language to help you.

Extention: Consider acting the stories out, or creating a drawing to represent the perfect spot.

Shark egg case hunt role-play

Turn your classroom or schoolyard into a mock beach!

Cut out the paper 'egg cases'* on the worksheet on the next page and hide them. Then have students search for them in your classroom or in an area of the school grounds. Using tools such as rulers and magnifying glasses, students can then collect data on the egg cases they find, and attempt to identify them from their recorded data. Students can use the 'School egg case hunt data collection sheet' on page 7 to help record their data.

As an extra challenge, have students match their recorded data to pages 30–31 in *The Great Shark Egg Case Hunt* without referring to their collected eggs. How useful are their observations in helping them identify the species?

* Note: The egg cases are not to scale.

Shark egg case hunt role-play worksheet

School egg case hunt data collection sheet

Size of egg case (cm)	Egg case colours and patterns	Egg case shape and features	Shark species

The Great Eggcase Hunt

The Great Eggcase Hunt has landed on Australian shores, calling on citizen scientists to look for egg cases underwater or washed up on beaches.

The Great Eggcase Hunt is a citizen science project initiated in 2003 by the Shark Trust in the United Kingdom. CSIRO partnered with the Shark Trust in 2023 to launch the project in Australia, and in its first 10 weeks more than 1,000 photos of egg cases were uploaded by citizen scientists.

CSIRO scientists at the Australian National Fish Collection in Hobart are matching egg cases to the species that laid them. They are important for understanding the basic biology of oviparous chondrichthyans (cartilaginous fish that lay eggs). They can also reveal valuable information, such as where different species live and where their nurseries are located.

Helen O'Neill is a fish biologist at the collection.

"We borrow egg cases from other collections, museums and aquariums around the world. We also have our own specimens collected from fish markets, surveys at sea or extracted from the ovaries of preserved specimens in our collection," Helen said.

"Citizen scientists' sightings on beaches will help us discover what the egg cases of different chondrichthyans look like. Some species are still unknown."

To find out more about how the Australian National Fish Collection helps sustainably manage Australia's marine biodiversity, see https://www.csiro.au/en/about/facilities-collections/collections/anfc.

To help support students to research sharks and their egg cases, there are free identification posters and field guides available at sharktrust.org and sharktrust.org/greateggcasehunt, or scan the QR code below for more information.

Australian Curriculum Links (Version 9.0)

Year level	Learning area: Science	Other learning areas
Years 1/2	**Science Understanding: Biological sciences** • Identify the basic needs of plants and animals, including air, water, food or shelter, and describe how the places they live meet those needs (AC9S1U01) **Science Inquiry: Planning and conducting** • Make and record observations, including informal measurements, using digital tools as appropriate (AC9S2I03) **Science Inquiry: Communicating** • Write and create texts to communicate observations, findings and ideas, using everyday and scientific vocabulary (AC9S1I06)	**Literacy: Creating texts** • Create and re-read to edit short written and/or multimodal texts to report on a topic, express an opinion or recount a real or imagined event, using grammatically correct simple sentences, some topic-specific vocabulary, sentence boundary punctuation and correct spelling of some one- and two-syllable words (AC9E1LY06) **Language: Language for expressing and developing ideas** • Experiment with and begin to make conscious choices of vocabulary to suit the topic (AC9E2LA09) **HASS: Geography** • How places can be spatially represented in geographical divisions from local to regional to state/territory, and how people and places are interconnected across those scales (AC9HS2K03)
Years 3/4	**Science Understanding: Biological sciences** • Compare characteristics of living and non-living things and examine the differences between the life cycles of plants and animals (AC9S3U01) • Explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships (AC9S4U01) **Science as a Human Endeavour: Nature and development of science** • Examine how people use data to develop scientific explanations (AC9S3H01)	**Literature: Creating literature** • Create and edit imaginative texts, using or adapting language features, characters, settings, plot structures and ideas encountered in literary texts (AC9E3LE05) **HASS: Skills: Concluding and decision-making** • Propose actions or responses to an issue or challenge that consider possible effects of actions (AC9HS3S06) **HASS: Geography** • The importance of environments, including natural vegetation and water sources, to people and animals in Australia and on another continent (AC9HS4K05)
All	**Cross-curriculum Priority: Sustainability – Systems** • All life forms, including human life, are connected through Earth's systems (geosphere, biosphere, hydrosphere and atmosphere) on which they depend for their wellbeing and survival (SS1)	

Related books from CSIRO Publishing

For younger readers:

- *Hatch* (https://www.publish.csiro.au/book/8159)
- *Oceans at Night* (https://www.publish.csiro.au/book/8104)
- *Our World of Wild Wonders* (https://www.publish.csiro.au/book/8176)
- *The Great Southern Reef* (https://www.publish.csiro.au/book/8042)

For older readers:

- *Sensational Australian Animals* (https://www.publish.csiro.au/book/8094)

Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: https://www.csiro.au/en/Education