Jan Barwick, *Coral Reef by Night*, 1980.

Inspiration Artists: Jan Barwick, Sarah McDougall

Age Range: 6+

Subject Areas: Art, Environmental Science

ART & CORAL REEF CONSERVATION

NATIONAL GALLERY CAYMAN ISLANDS

DART

MINDS INSPIRED

In this Packet

This lesson inspired by the work of Cayman-based artists Jan Barwick and Sarah McDougall teaches students about the importance of coral reefs, how they are being threatened by pollution and climate change, and what we can do to protect them.

In a follow-up art activity, students will gather recyclable and non-recyclable objects from around their home to recreate their own coral reef, and consider how pollutants like plastic affect marine environments. Discussion questions are also provided to facilitate further dialogue.

Sarah McDougall, *Tides of Change*, 2019 (detail)

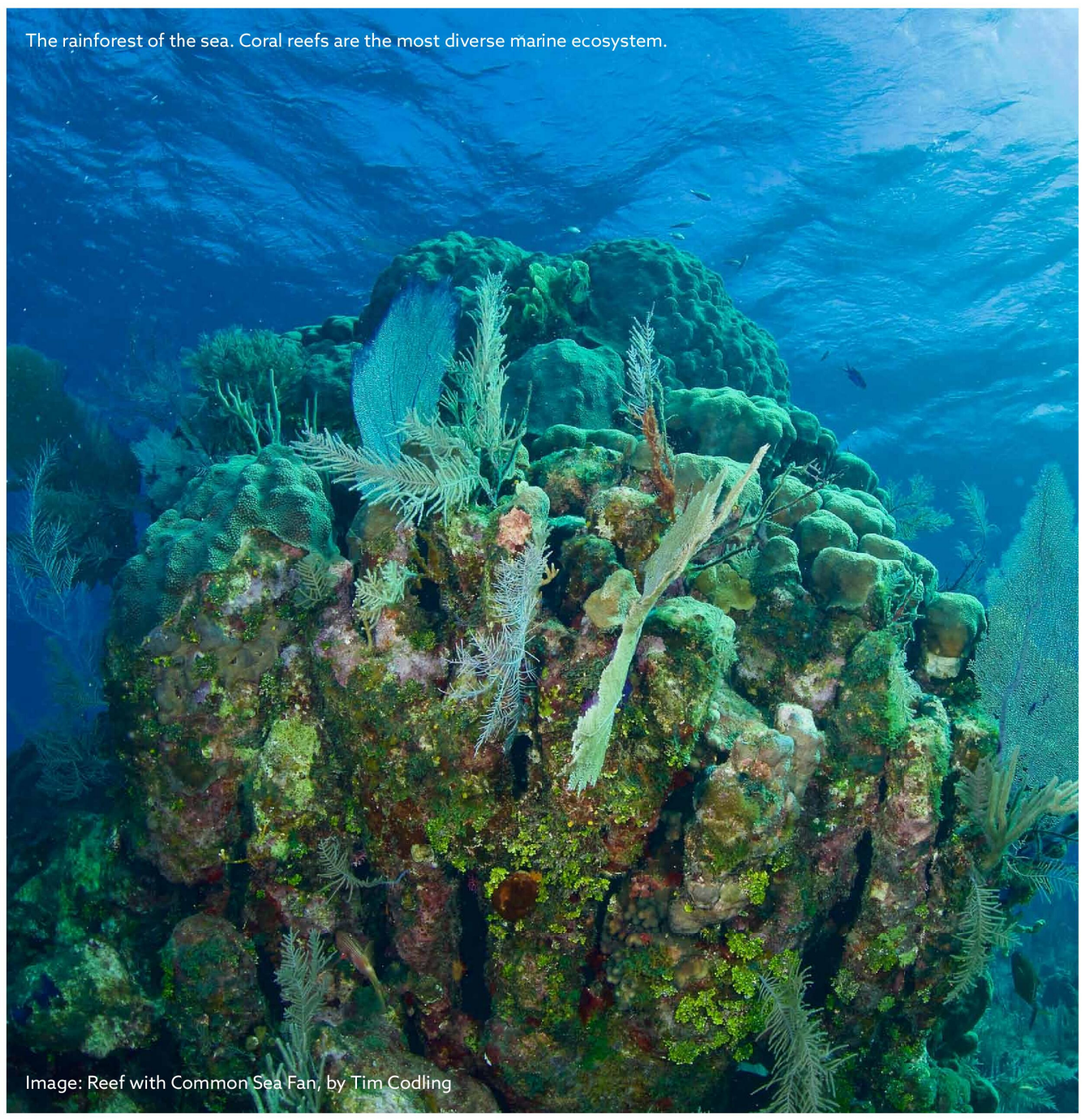
What is a Coral Reef?

INTRODUCTION TO CORAL REEFS

Coral reefs contain approximately 25% of the ocean's species, making them the most diverse marine ecosystem and giving them the nickname "the rainforests of the sea." This fact is made even more amazing when you consider that coral reefs only cover 0.1% of earth's surface!

Reefs provide food and shelter for thousands of species of plants and animals, including fish, crustaceans, sponges, algae, and turtles.

Reefs are important for people, too. Throughout the world, humans rely on coral reefs for food, protection from storms, jobs based on tourism, and even medicines.



The rainforest of the sea. Coral reefs are the most diverse marine ecosystem.

Image: Reef with Common Sea Fan, by Tim Codling

Adapted from www.oceanservice.noaa.gov, www.ocean.si.edu

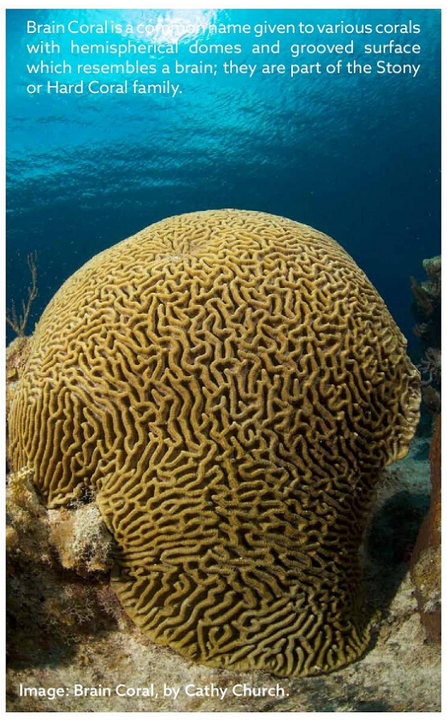
Individual polyps live together to form massive colonies.

Image: Great Star Coral Pink and Yellow, by Lindsay McGill

WHAT ARE CORAL REEFS?

Coral reefs are created from the skeletons of many small, soft-bodied animals closely related to anemones. Each coral animal is called a polyp, which consists of a soft cup of tissue surrounded by a ring of stinging tentacles used for capturing food. While individual polyps are very small—some are about the size of a pinhead—they join to form massive colonies. Coral reefs are formed by hermatypic corals or hard (stony) corals, which create skeletons made of calcium carbonate or limestone. These limestone skeletons are the building blocks of the reefs. Reefs come in many shapes and sizes, the biggest of which is Australia's Great Barrier Reef.

At 1,240 miles long, the Great Barrier Reef is earth's largest structure built by living organisms and is the only living structure that can be seen from outer space! It takes a long time to grow a coral colony or a reef, because each coral grows slowly, with most corals growing less than an inch per year. Individual colonies can often live decades to centuries, which we know because corals lay down annual growth rings, just like trees. By studying these skeletons, we can learn about what environmental and atmospheric conditions were like hundreds or thousands of years ago. The Great Barrier Reef began growing about 20,000 years ago!



Brain Coral is a common name given to various corals with hemispherical domes and grooved surface which resembles a brain; they are part of the Stony or Hard Coral family.

Image: Brain Coral, by Cathy Church.

Adapted from www.oceanservice.noaa.gov, www.ocean.si.edu, www.doe.ky/resources/teachers

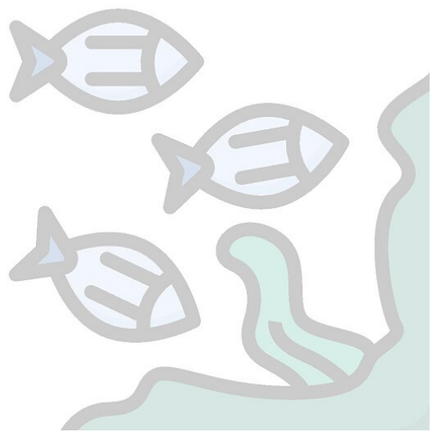
3.4 acres of fringing reefs surround Grand Cayman

Image: A Tiny Reef Habitat, by Courtney Platt

CAYMAN'S REEFS

The three Cayman Islands are all completely surrounded by reefs. Surrounding most of Grand Cayman are shallow water fringing reefs, which create shallow water sounds, such as the North Sound. Beyond the fringing reefs are two terraces which eventually plunge dramatically to form the famous 'Cayman Wall'. Little Cayman also has a large amount of shallow fringing reefs and associated sounds, whereas Cayman Brac has a very different topography. Reefs have been culturally and economically significant to Caymanians for hundreds of years and continue to play an integral role in our community today through tourism, fisheries, and protection of our shorelines. Recognizing the importance of our coast, the Cayman Islands has a Marine Conservation Law and Marine Parks Regulations to manage and protect our marine environment.

Adapted from www.doe.ky/resources/teachers/, www.nationaltrust.org.ky/coral-reefs



THREATS TO AND WAYS TO PROTECT

CORAL REEFS

It's hard to imagine that something as ancient and complex as reefs can be fragile, but coral reefs are extremely sensitive to environmental changes. The most serious of which are rising water temperatures and ocean acidification. High water temperatures cause coral bleaching, which can kill coral colonies or leave them stressed and vulnerable to other threats.

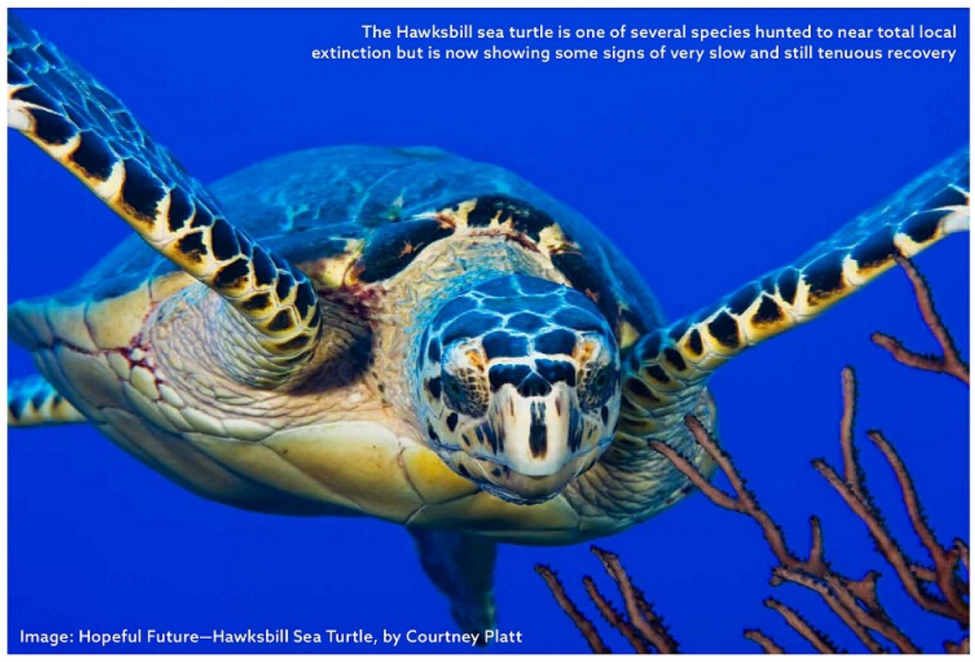
Meanwhile, ocean acidification makes it more difficult for corals to build their calcium carbonate skeletons. Other natural threats include storms, diseases, and and coral consuming animals such as snails and fireworms.

Human activities including pollution, over fishing, coastal development, destructive fishing, harvesting practices, and the introduction of invasive species such as the Lionfish are among other serious threats to coral reefs, but it's not all bad news! There are many ways that we can reduce these threats and protect these beautiful reefs.

Practices such as conserving energy, reducing the amount of waste we produce, and choosing sustainable seafood are just a few examples of simple actions that we can take to help protect coral reefs. And of course, educating yourself and others about coral reefs is one of the most important things you can do for the reefs!

Invasive species such as Lionfish threaten reefs, as they eat native fish and crustaceans and do not have any known native predators.

Red Lionfish (Pterois volitans), by Courtney Platt.



The Hawksbill sea turtle is one of several species hunted to near total local extinction but is now showing some signs of very slow and still tenuous recovery

Image: Hopeful Future—Hawksbill Sea Turtle, by Courtney Platt

Adapted from www.oceanservice.noaa.gov, www.ocean.si.edu

How Local Artists Respond

Jan Barwick was born in New Zealand in 1953. She is known for her bright, representational style inspired by her childhood years observing nature in the Pacific, and her adult years capturing the vibrant colours of Florida and the Cayman Islands. Barwick's art hints at transient beauty; Kiribati, the island where she grew up, is said to be the first nation that will vanish due to rising sea levels as a result of climate change.

In *Coral Reef by Night*, Barwick represents a section of Cayman's underwater world at night. She includes many of the country's well-known marine species including a grouper, manta ray, turtle and moray eel. Contrast Barwick's image of a healthy, lively reef with Sarah McDougall's piece representing a reef that has perished due to coral bleaching on the next page of this packet.

How Local Artists Respond

Sarah McDougall graduated in Costume Design from Liverpool School of Art, spending 20 years working on stage and screen costumes before re-training as a teacher. As a textile artist, McDougall uses vintage fabrics to re-visit some of the historical techniques she learnt for costume design, creating unique pieces in the process.

In *Tides of Change*, McDougall refers to the coral bleaching that has placed coral environments worldwide in danger. This delicate and detailed fabric artwork invites the viewer to touch, but the bell jar prevents that. It reminds us of the importance of protecting our coral reefs from too much human interference.

International Spotlight

Check out these international artists who have created artwork about protecting coral reefs.

Max Liboiron

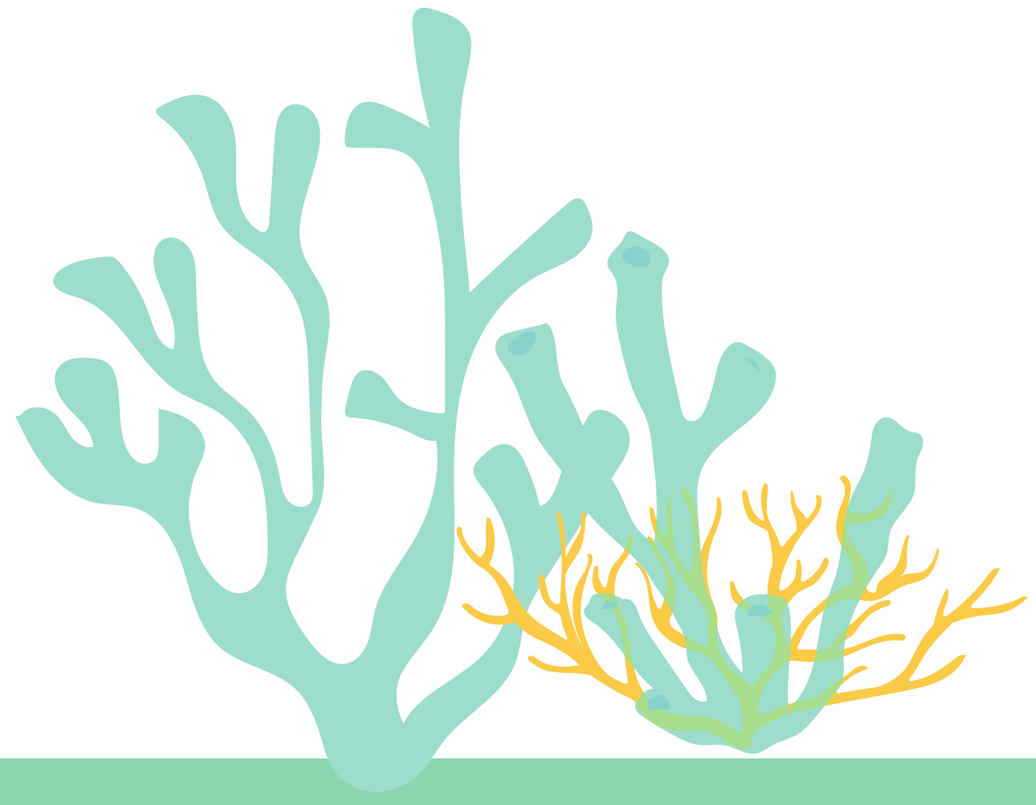
Max Liboiron is a science and technology scholar with a sepcial focus on environmental science. As an artist, she uses materials discovered during her environmental research to create installations which challenge our understanding of plastics and marine environments.

Learn more at:
https://oceanic.global/max-liboiron/

John Dahlsen

John Dahlsen is an Australian artist who collects beach litter and plastic debris, turning them into works of art that comment on ocean pollution and human threats to coral reefs and marine environments.

Learn more at:
https://johndahlsen.com/



Art Activity

Materials:

- Drawing paper (plain printer paper works)
- Pencil
- Eraser
- Glue stick or liquid glue
- Scissors
- Paint or markers

Recycled Object Options:

- Bottle caps
- Old magazines or newspapers
- Plastic food utensils, cardboard, old toilet rolls, or plastic food packaging

On the drawing paper, draw the outline of a reef large enough to fill the entire page. Rip the newspaper and/or magazine pages into shapes that you will then glue onto your reef outline. Jagged edges are fine! Cut your other recycled objects into smaller pieces that can fit on your reef. Older students can try stacking bottle caps, or gluing toilet rolls into standing coral tubes. This will add a three-dimensional element to your art. As you work, think about how these very items can damage the reefs that protect us and so many other species.

Source: https://www.pinterest.com/pin/396598310937420442/

Follow-up Questions

- What types of objects did you find to create your reef?

- Can you express what it felt like to create a piece of art made out of objects that often have a negative effect on our ocean environment?

- Why are coral reefs so important both on a local and global scale?

- What are some ways to prevent the pollution of our oceans? Can you think of ideas than can be practically put to use?

- What do you think people your age can do to keep coral reefs healthy and thriving?

- Have you ever been diving, snorkeling or out swimming? What are some things you notice while in the water?

- How can artworks like Jan Barwick and Sarah McDougall's work teach us about the environment?