Reef HQ Education

Teaching Unit

Polyps and Pufferfish

Early Years and Primary

In this Reef HQ Education Program students explore the unique and diverse world of living and non-living things on the reef. Through interactive experiences and contact with live animals, students learn about the diversity, needs and interrelationships of creatures on the reef.

Curriculum Links

Completing this Reef HQ Education Program will develop students' ability to:

- Discuss their ideas about the needs of Great Barrier Reef inhabitants;
- Group living things in different ways based on observable features;
- Observe and describe components of familiar environments;
- Draw conclusions about the relationships between features of living things and the environments in which they live;
- Collect information about sources of food and shelter for animals on the Great Barrier Reef;
- Look for patterns and relationships between the features of different living things and how their needs are met;
- Understand and illustrate some of the changes which take place in the course of the life span of living things; and
- Make links between different features of the Great Barrier Reef and the specific needs of its living inhabitants.

The following unit includes suggestions for activities that can be completed before and after your Reef HQ visit.

Reef HQ Visit

This teacher resource is linked to a class visit to Reef HQ. The Reef HQ visit will enable students to:

- Explore the needs of Great Barrier Reef inhabitants;
- Gain an appreciation for the diversity of life found on the Great Barrier Reef;
- Observe the features of different groups of Great Barrier Reef inhabitants; and
- Investigate features of the Great Barrier Reef and the specific needs of its' living inhabitants.

Theme Overview

The Great Barrier Reef

Imagine a place so large, it can be seen from a spacecraft orbiting the earth!

The Great Barrier Reef stretches for more than 2000km along the northeast coast of Australia. Comprising more than 2900 reefs, some 940 islands and surrounding waters, the Great Barrier Reef is the largest natural feature on the earth.

Covering over 348 000 km^2, the Great Barrier Reef World Heritage Area is internationally recognised as a unique area of outstanding value to humankind and a jewel in the crown of the world's natural wonders.

The Great Barrier Reef provides habitats for a wide variety of marine-based plants and animals. The Reef is home to approximately:

- 1500 species of fish;
- 360 species of hard corals;
- One-third of the world's soft corals;
- 4000 species of molluscs (eg. shells);
- 1500 species of sponge;
- 800 species of echinoderms (starfish, sea urchins, etc);
- 500 species of seaweed;
- 23 species of marine mammals; and
- 6 species of marine turtles, all of which are listed as rare or threatened.

While coral reefs initially made the Great Barrier Reef famous, the area also comprises of many other interconnected habitats:

- Mangrove estuaries;
- Sandy and coral cays;
- Continental islands;
- Seagrass beds;
- Algal & sponge 'gardens';
- Sandy or muddy seabed communities; and
- Continental slopes and deep ocean trenches.

Coral reefs are sometimes described as the rainforests of the sea. Their beauty and diversity is unrivalled in the marine environment. It is very important that all people appreciate the interconnectedness and importance of all Great Barrier Reef habitats.

Polyps and Pufferfish – Activity Ideas

Tuning In

Providing Stimulus Materials

The following activities can be used to stimulate though and questions about the Great Barrier Reef and the animals and plants that live there:

- Read the *Big Picture Book* of the Great Barrier Reef by Steve Parish;
- During the course of the unit ask students to collect information from television, radio, newspapers and magazines about the Great Barrier Reef;
- Have children find information about the Great Barrier Reef on the Internet or in books, magazines etc;
- A – Z of the GBR - Make a list of reef related terms beginning with a different letter of the alphabet;
- Read and discuss picture books, fiction and non-fiction materials with a sea or reef setting;
- Watch videos related to the Great Barrier Reef and the ocean;
- Provide time for students to explore CD-ROMs;
- Visit Web-sites related to the sea and the reef; and
- Have students discuss their personal reef experiences and items of interest in a sharing circle. Use a 'speaking conch' or other shell. Whoever has the shell contributes, while the others listen, ready to ask questions.

Research Centre

Set up a research centre that features a touch table, microscopes, computers, posters, photos and books on bulk loan from the library.

Ask students to contribute by bringing in materials they have at home which relate to the sea or the Great Barrier Reef including photos, posters, shells and beach finds.
Central to the research centre could be a large, empty book. This could be filled during the course of the unit with information the students have learned about reef creatures.

Imagining Echinoderms

The names of some reef inhabitants are wild and wonderful. Many children may never have heard of them. Hearing their names could dream up all sorts of imaginary creatures and critters. Read students some names of reef inhabitants and ask them to draw and write any special characteristics of these animals. Reinforce that this is not an activity where there is a right or wrong, it's an activity that stimulates their imagination.

Share student's drawings and explanations, and show pictures/video/images of the real reef creatures. For example:

Echinoderms	Nudibranch	Nautilus	Christmas Tree Worm
Sea Squirt	Goatfish	Fire coral	Spider shell
Crown of thorns starfish		Tiger shark	

Class Discussion

Share ideas about the features the Great Barrier Reef and the Great Barrier Reef Marine Park. Use an atlas to show the size of the Great Barrier Reef.

Provide students with time to respond to each of the following questions:

- Where is the Great Barrier Reef?
- How large is it?
- Is the Great Barrier Reef a home for many different types of animals and plants?
- What types of animals live on the Great Barrier Reef?
- What types of plants live on the Great Barrier Reef?
- How do people use the Great Barrier Reef?
- Why is the Great Barrier Reef important?
- What might happen if we do not look after the animals and plants that live on the Great Barrier Reef?

Picture Gallery (electronic imaging)

Using the *GBR Explorer* and *Visual Library* as stimulus sources. Print out images of the Great Barrier Reef from the Reef ED website:

GBR Explorer
http://www.reefed.edu.au/explorer/

Visual Library
http://www.reefed.edu.au/library/index.html

Ask students to bring in photographs or books with pictures of the Great Barrier Reef and its islands, animals and plants. Discuss features of the Great Barrier Reef such as:

- Size;
- Types of animals found;
- Types of plants found;
- Areas for boating, fishing, visiting, and other recreational activities; and
- Areas they enjoy visiting.

Preparing to Find Out

Questions...Questions...Questions

During the unit, the students will ask many questions. Talk with the students about the many ways to find the answers including looking, asking and experiencing.

Encourage students to use the question grid below when formulating their questions.

What is?	Where/when is?	Which is?	Who is?	Why is?	How is?
What did?	Where/when did?	Which did?	Who did?	Why did?	How did?
What can?	Where/when can?	Which can?	Who can?	Why can?	How can?
What would?	Where/when could?	Which could?	Who would?	Why would?	How would?
What will?	Where/when will?	Which will?	Who will?	Why will?	How will?
What might?	Where/when might?	Which might?	Who might?	Why might?	How might?

Discuss the people or places that might help them find out the answers to their questions.

These may include Reef HQ, teacher/librarian, expert, parents, Internet or books.
Discuss some of the questions students have. Collate them into table form, and then give the students time to find out the answers.

Questions	***Where do we find out the answer?***	***How?***	***Answers***
What colour is an octopus?	Internet	Research	An octopus can change its colour!
Why does a sea snake have a tail like a paddle?	Reef HQ	Experience / Observe	So it can push itself through the water like a sideward-facing flipper.
What is the largest shark in the world?	In a book or ask an expert	Look or Ask	Whale Shark

During the course of your unit, encourage students to add to the table.

Relationships

Read *A House for Hermit Crab* by Eric Carle. Discuss the relationships between the crab and its shell. Ask students if they know of any other relationships between a living marine animal and something that is not alive. Students may suggest other homes that animals rely upon including rocky crevices, caves, amongst seagrass and inside shipwrecks. Explain to the children that animals may have relationships with other animals that are important for their survival. Examples could include:

- A goby and alpheid shrimp. Gobies have good eyesight and are very alert. The shrimp however has poor vision but remains in contact with a goby by using its long antennae. Should danger threaten, the retreating fishes alert the shrimp and they all retreat into the burrow. In return, it is the role of the shrimp to do most of the making and maintenance of the burrow.

- Remora or suckerfish hitch rides on sharks, rays, whales, turtles and even divers by sucking its dorsal fin against the host. They may remove parasites from their host, therefore 'paying' for their ride.

Have the students role-play the above relationships and ask them to find out about other relationships that occur on the reef.

Finding Out

Visit Reef HQ and explore the reef up close. Encourage students to develop a list of questions they want answered about the Great Barrier Reef.

GBR Explorer

Use the Great Barrier Reef Marine Park Authority's reef education website

www.reefed.edu.au

The "GBR Explorer" is like an online encyclopaedia about the Great Barrier Reef.

Sorting Out

Classification

The Great Barrier Reef has:

- Over 1500 species of fish;
- Six of the world's 7 species of marine turtle;
- World's largest green turtle breeding area;
- One of the world's most important dugong populations;
- Important seabird breeding islands; and
- Breeding area for humpback and other whale species.

Read the *Marine Life for Young Readers* series by Stanley Swartz.
Read the *Big Picture Book of the Great Barrier Reef* by Steve Parish.
Read some of the titles from the *Kids and Water* series from Wet paper.

Some of these groups of animals could become a major focus of your unit:

- Molluscs;
- Crustaceans;
- Reef Fish;
- Marine Turtles;
- Sea Snakes;
- Marine Mammals; and
- Sharks and Rays.

Many groups of animals make their homes on the Great Barrier Reef. Students could study the characteristics of these animals, sort and classify, develop matching activities (Reef Bingo), research certain species, watch videos or read books about these sea creatures.

The Great Barrier Reef World Heritage Area is made up of many habitats. Introduce students to some of the habitats below, their characteristics and the various animals that live there:

- Coral Reefs;
- Mangroves;
- Islands;
- Seagrass beds; and
- Deep ocean trenches.

On large pieces of butchers paper or cardboard ask students to classify animals based upon different characteristics. Ask students to suggest different categories in which to put the animals.

Categories could include: have a hard shell; eat other animals; eat plants; feed by sucking water into their body; have cartilage for a skeleton; have a bony skeleton; are cold blooded; are warm blooded; have a muscular foot; no head or brain; moves by using tube feet; can sense electricity; and marine reptile.

Asking students to create a mural entitled ***The Blue Highway*** can further extend this activity. The blue highway will show all of the different habitats connected together and the various animals that live in each of the habitats. Challenge students to choose one species that spends parts of its life cycle in each of the habitats along the blue highway and include it on the mural to show the connectedness of each of the habitats.

Reef HQ information

Discuss your excursion to Reef HQ.
Write recount sentences about the visit to Reef HQ eg. At Reef HQ I found out….

Going Further

Big Books

Students could organise the information learned into a web-site, play, information report, power-point presentation, newspaper report, report, short story using characters of the reef, speech or write a big book.

Dioramas

Have students make dioramas. Students could choose one of the following relationships to feature:

- Mangroves;
- Coral Reefs;
- Islands and Seabirds; and
- Seagrass and Dugong.

Making Connections

Web Quests

Web Quests are inquiry-oriented activities in which some or all of the information that learners interact with comes from resources on the Internet. Challenge students to participate in and complete the *Discover me in the Sea* web quest. This web quest and others can be found at:

http://www.reefed.edu.au/students/reef_quest/index.html

Note: In situations were Internet Technology is not readily available to all students. The Web Quests could be accessed by teachers, printed out and used as action research projects in the classroom. Specific resources can be obtained by contacting the Great Barrier Reef Marine Park Authority.

Taking Action

Letter to Reef HQ

Ask students to write a letter to us here at Reef HQ. Have the students tell us about their Reef HQ excursion or an animal they learnt about during their studies.

The Education Team
PO Box 1379
TOWNSVILLE Qld 4810

Animals and Habitats Exhibition

Students display or exhibit work created during their unit on the various animals and habitats of the Great Barrier Reef in school or local library. Invite an audience to view student work. Encourage students to explain the nature of their various pieces of work and give a behind-the-scenes interview with the audience.

Creating Popular Culture

Students can develop slogans that encourage protection of reef animals and their habitats. Screen print T-shirts or calico bags and sell them to raise money for field trip or school environment group.

Community Education

Give students an opportunity to share their new knowledge of the Great Barrier Reef, and to keep learning about marine conservation. Encourage them to:

- Contribute to a class article for the school newsletter;
- Participate in Clean Up Australia Day and other environmentally related celebrations;
- Join their school environment club;
- Design and make reef creature costumes; and
- Put on a performance to highlight the interconnectedness of the habitats;
- Write a song, poem or story about reef inhabitants. Perform to other classes.

Become a Reef Guardian School

This is an exciting, innovative program that encourages students, teachers, parents and friends to become involved in protecting our environment and the Great Barrier Reef. Reef Guardian Schools are environmentally active and participate in reef education through activities and environmentally friendly initiatives. Students and teachers promote best environmental practices and the importance of Reef protection to their communities. To find out more go to:

http://www.reefed.edu.au/guardians/

Websites

Queensland Studies Authority – Science Syllabus
http://www.qsa.qld.edu.au/yrs1to10/kla/science/docs/syllabus/syllabus.pdf

Reef ED
www.reefed.edu.au

Great Barrier Reef Marine Park Authority
http://www.gbrmpa.gov.au

Reef HQ
http://www.reefHQ.com.au

Australian Institute of Marine Science
http://www.aims.gov.au/

CRC Reef
http://www.reef.crc.org.au/

Department of Environment and Heritage
http://www.deh.gov.au/

Department of Primary Industries
http://www.dpi.qld.gov.au/home/default.html

Environmental Protection Agency/Queensland Parks and Wildlife Service
http://www.epa.qld.gov.au/

Oceans & Coasts Marine Species Conservation
http://www.deh.gov.au/coasts/species/

Marine Pest and Threat Education Program
http://www.ausmepa.org.au/home/

State of Environment – Townsville
http://www.soe-townsville.org/marineandcoastal.html

National Geographic - Virtual World "Great Barrier Reef"
http://www.nationalgeographic.com/earthpulse/reef/reef1_flash.html

References & Resources

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Wet Paper Publishers and Consultants. (2000) *Kids and Water Series*. Australia : Wetpaper.