Beneath the South Pacific

The tropical Pacific, like other tropical ocean regions, contains warm, clear water. The water is clear because there is very little plankton and other suspended particles that would make it look cloudy. Plankton is the base of the food web in all oceans and, because there is little plankton in the tropics, tropical ocean water is nearly sterile in comparison to the fertile waters of the temperate oceans. This is in contrast to the popular misconception that tropical ocean regions are very high in biological productivity. In order for life to flourish in the harsh conditions of the nutrient-poor tropical seas, the creatures of the seas have evolved many methods to capture food.

The coral reef community is a successful example of adaptation to this environment. The reef is a living structure made by coral animals. The reef itself is adapted to survive and grow in the tropical seas. As it grows, it provides a safe haven for fish and invertebrates to hide, to feed, and to reproduce. This draws all kinds of life to the reef. The smaller fish draw larger fish and sharks. So the reef forms the basis of a complete ecosystem.

Beneath the South Pacific shows the importance of the reef community and introduces viewers to many of the great number of unique and fascinating creatures that live around the reef, as well as some that do not.

Vocabulary

Cnidarian (nid-AIR-ee-an): a phylum of marine creatures whose members all have stinging cells called nematocysts. This includes sea anemones, jellyfish, corals, and the hydroids.
Nematocyst (neh-MAH-toe-sist): a specialized stinging cell utilized exclusively by Cnidarians.
Anemone: a polyp-shaped, bottom-dwelling, free-living Cnidarian with no skeleton.
Jellyfish: a mendusa-shaped (bowl-like), free-swimming Cnidarian with no skeleton.
Coral polyp (PAUL-ip): an individual coral animal. It is polyp shaped, but has a skeleton made of calcium carbonate and lives in colonies.
Echinoderm (eh-KINE-oh-derm): a phylum of invertebrates including sea stars, sea cucumbers, sea urchins and crinoids. It literally means "spiny-skinned."
Chemosensitive: sensitive to chemical smell.
Chromatophore: a skin cell which can change color.

Topics to discuss before viewing

1. Why is the tropical ocean water so clear? Why is temperate ocean water so murky?
2. Why do fish and invertebrates need places to hide? If there were no places to hide, what would they do?
3. What is a symbiotic relationship? Does it have to be beneficial to both partners? Give an example of symbiosis.
4. Besides swim, what else does the sea turtle have to do while it is underwater?

Questions to ask after viewing

1. Why is the tropical ocean water so clear? What makes tropical water appear blue? (Tropical water is clear because there is very little plankton in the water to reduce the clarity. It appears blue because the ocean absorbs all wavelengths of light, for the short wavelengths of blue.)
2. Why are tropical oceans low in plankton? (They are low in nutrients for the phytoplankton to absorb.)
3. What is a coral reef? How is the reef important in the coral reef community? (A coral reef is a living structure made up of coral animals called polyps. The reef provides places for fish and invertebrates to hide and make nests. In turn, those animals attract larger animals to the reef.)
4. Why are sharks important in the reef ecosystem? (Sharks occupy the top of the food chain, feeding on the sick and weak, thereby keeping the gene pools strong.)
5. What trait is characteristic of all sharks, skates and rays? (They are all cartilaginous fish, having a skeleton made of cartilage rather than bone.)
6. What trait is common to the stonefish and the lionfish? (They are both venomous and have spines for injecting venom into predators.)
7. What is special about the anemone, and the anemonefish? (They live together in a mutualistic symbiotic relationship.)
8. What are the chromatophores in the octopus' skin used for? (They are color cells, which allow the octopus to change color to match its surroundings.)
9. What is an echinoderm? Give some examples from the film. (Echinoderms and invertebrates. The word means "spiny-skinned" and includes the sea stars, crinoids, sea cucumbers and sea urchins.)
10. What does the Crown-of-thorns sea star eat? What would happen if there were too many Crown-of-thorns sea stars in the same area? (The Crown-of-thorns eats coral. Too many of them could destroy the reefs, and therefore destroy the reef ecosystem.)
11. What does the parrotfish eat, and what does it produce as a result? (Parrotfish eat algae growing on dead portions of the reef. When they eat the algae, they also eat the limestone of the reef. The limestone is chewed, passed through the digestive tract and excreted as sand. To a large degree, beach sand comes from parrotfish!)

12. How does the damselfish keep its food away from other fish? (It guards its food, which it also cultivates.)
13. How does the sea cucumber defend itself if attacked? (The sea cucumber protects itself by releasing long, sticky strands of poisonous tissue, to incapacitate a predator.)
14. How does the goby help the blind shrimp survive? How does the shrimp help the goby? (The goby serves as the shrimp's eyes, so the shrimp will not be eaten. The shrimp digs the burrow and maintains it, so that the goby has a place to live.)
15. What are the barbels of the goatfish used for? (The goatfish feeds on small invertebrates like worms and mollusks, which it finds living in the sand. The barbels are used to dig around in the sand to find prey.)

Additional Activities

- Lead discussion about how human beings relate to this coral reef community; are we constructive or destructive to its ecosystem? Have students suggest ways humans have been harmful, and ways they could be helpful to this ocean community.
- Let students work in cooperative groups to make a display, poster, diorama or model of an example of another ecosystem. You may want to approve their topic before they begin work to assure there are no duplicates. After students have had time to prepare their representations, ask each group to present their ecosystem to the class. If possible, have students make a video or audio recording of the group presentations, for reviewing at a later date.
- If possible, arrange to take the class to visit an aquarium or a store that sells tropical fish for a first-hand look at some of the creatures that live in the sea. On returning to the classroom, ask students to write a paragraph describing what they saw.

Additional AIMS Media Programs

Animal Life in a Tidepool 8384SG
Beneath the North Atlantic 8569SG
Ecosystems: Nature in Balance 8559SG
Sharks and How They Live 8813SG
The Coral Reef: A Living Wonder 8634SG
The Living Reef 8025SG

Length

- 25 minutes

Subject areas

- Life Science, Oceanography

Audience Levels

- Intermediate-Adult

Catalog Number

- 8846SG

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AIMS
Discussion Guide

Beneath the South Pacific

Objectives

- Teaches the importance of the coral reef in the tropical ocean ecosystem.
- Shows the role different creatures play in an ecosystem.
- Emphasizes the importance of different animals in the ecosystem.
- Shows the diversity of life in the tropical ocean.
- Helps instill respect for creatures of the seas.