

Springboard^{into} Comprehension 5

Main Idea Coral Reefs

Plagues

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Defying Gravity

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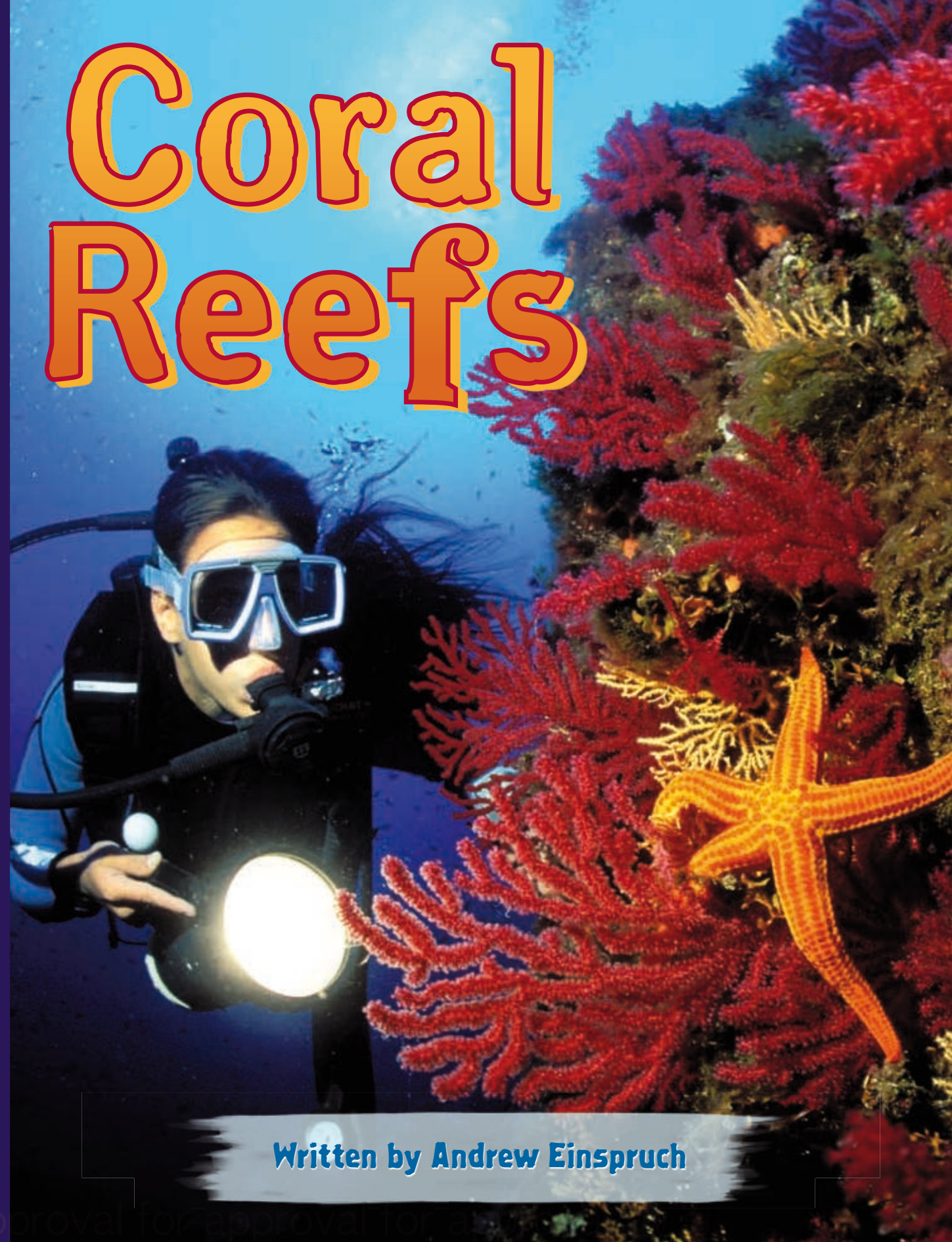
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Information Report

Coral Reefs



Written by Andrew Einspruch

Coral Reefs

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Beauty in the Ocean

Coral reefs are naturally occurring structures in the sea. They are mainly made up of the skeletons of marine animals called corals. The reefs build up over thousands and millions of years as the corals grow and die, leaving their hard remains behind. Corals only grow between .5 cm and 2.5 cm per year. Most coral reefs are 5,000–10,000 years old, but some are up to 50 million years old.

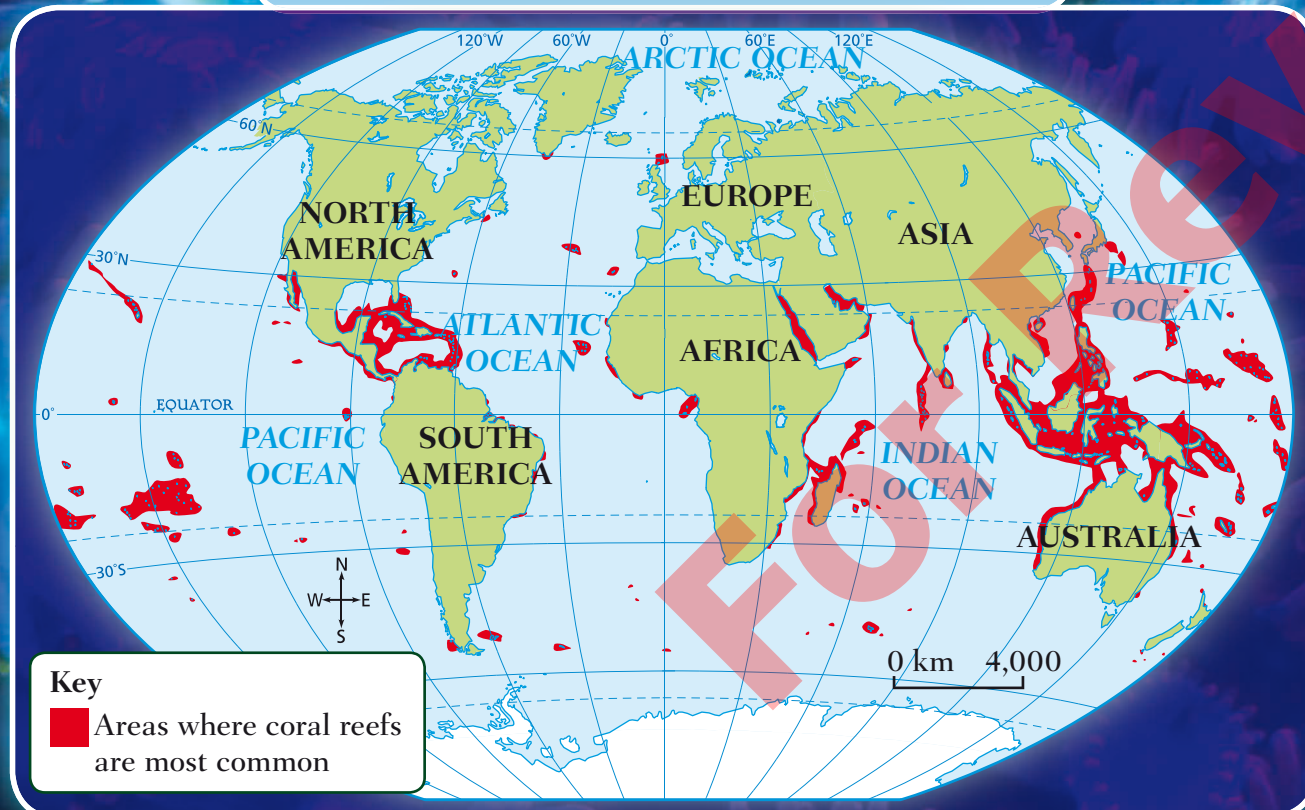
Coral reefs are home to a great variety of species. These range in size from tiny single-celled organisms to large species such as moray eels and dugongs. Sponges fill in many of the gaps. Some sponges even bore holes in the coral. This gives small fish and other animals a place to live.

Corals come in a huge variety of bright colours, as do the plants and animals, big and small, that make their homes in a coral reef. That is why coral reefs have been called “rainforests of the sea.” Like rainforests, they are dense with many different, often exotic, forms of life. Coral reefs are places of incredible beauty.

Coral reefs thrive in areas where the water is clear and has very few nutrients. The plants and animals that live there rely on each other for the nutrition they need. Coral reefs cover up to 500,000 square km. That is less than .2 per cent of the total sea floor, an area about twice the size of New Zealand. Even so, coral reefs are home to 25 per cent of all marine species.

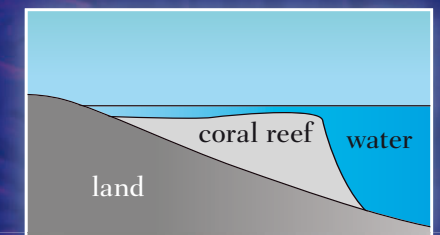
Kinds of Coral Reefs

Coral Reefs around the World



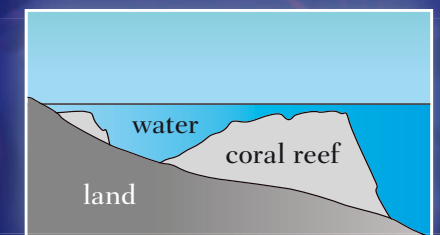
1. Fringing Reef

A fringing reef forms in shallow waters along a coastline. A fringing reef may have a shallow lagoon and form a narrow platform close to shore.



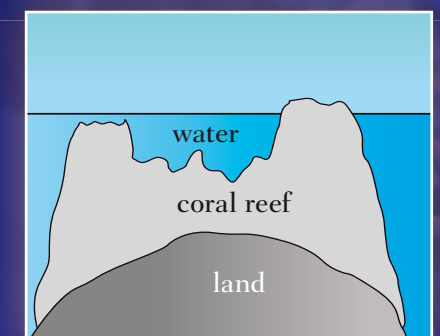
2. Barrier Reef

A barrier reef also grows parallel to a coastline. The land is usually separated from the reef by a deeper lagoon. A barrier reef often grows further out than a fringing reef.



3. Atoll

Sometimes, a fringing reef can become an atoll. The fringing reef forms around an old volcano. The coral grows up to the surface as the volcano subsides below sea level. The coral forms an oval mass with a central lagoon, an atoll. Sand and other materials are deposited on the reef ring, sometimes forming islands.



Anatomy of a Coral Reef

To understand coral reefs, you have to understand corals. There are about 850 kinds of corals, but unlike most other animals, these sea dwellers stay in one place their whole adult lives.

Corals are a lot like sea anemones. A coral has a simple cylindrical, tube-like body. This kind of body form is called a **polyp**. A polyp has a stomach inside, but no other inner organs such as a heart or liver. One end of the polyp is stuck to a surface, like the coral reef or the sea floor. The other end of the polyp has a mouth surrounded by a ring of tentacles. These tentacles have stinging cells to capture food that floats by.

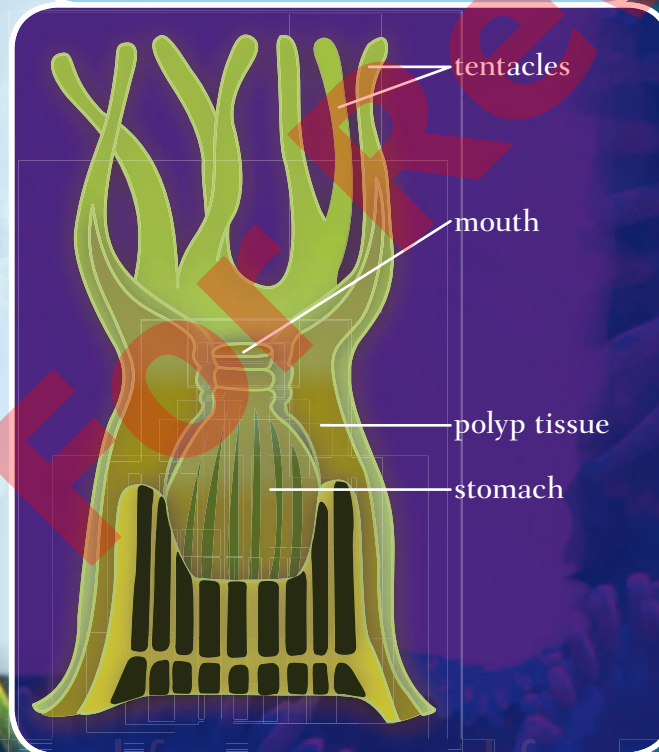
Unlike humans, corals have their skeletons on the outside. A skeleton like this is called an **exoskeleton**. The material this exoskeleton is made up of is also called coral.

All these skeletons give the reef an incredible strength. A coral reef has to withstand the constant battering of waves. Storms with extreme winds and waves can break off large chunks of a coral reef.

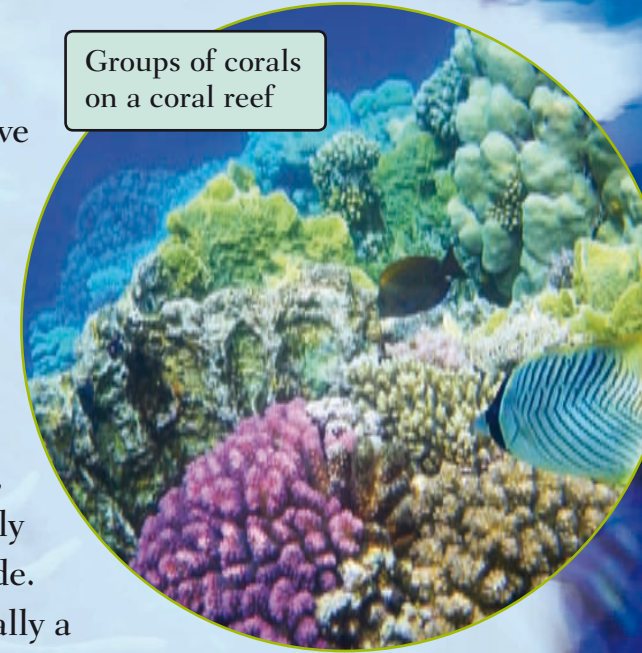
Star corals in the Atlantic Ocean



Parts of a Coral Polyp



Groups of corals on a coral reef



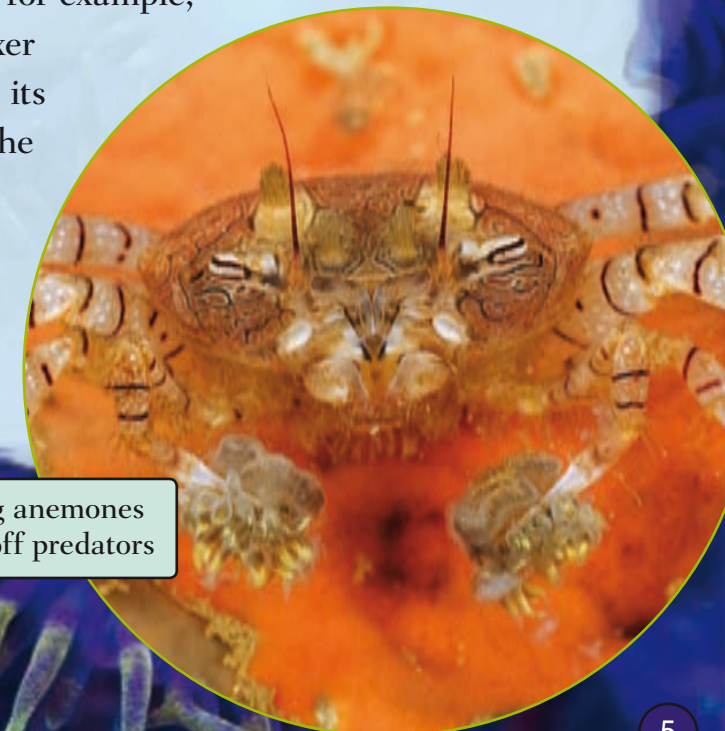
Coral skeletons give the reef most of its structure. Over millions of years, corals live and die, leaving their skeletons behind. New coral polyps grow and fix themselves to the remains of those that came before. The reef slowly builds as this cycle of life and death continues.

Most polyps found on coral reefs cluster together. They live in large groups, or **colonies**. Each polyp is quite small, only a few millimetres to a few centimetres wide. What looks like one piece of coral is actually a colony of thousands of polyps growing together.

Many corals have tiny, brilliantly coloured algae living in their cells. The corals give the algae a home. In turn, the algae provide up to 90 per cent of the energy the corals need. The algae also give corals their distinct colours. A relationship like this, where both species benefit, is called **mutualism**.

There are other examples of mutualism on a coral reef. Boxer crabs and sea anemones, for example, benefit from living together. The boxer crab holds a pair of sea anemones in its pincers. It protects itself by waving the sea anemone's stinging tentacles at attackers. In turn, the anemone gets to eat the food scraps the boxer crab drops.

A boxer crab holding anemones in its claws to fend off predators

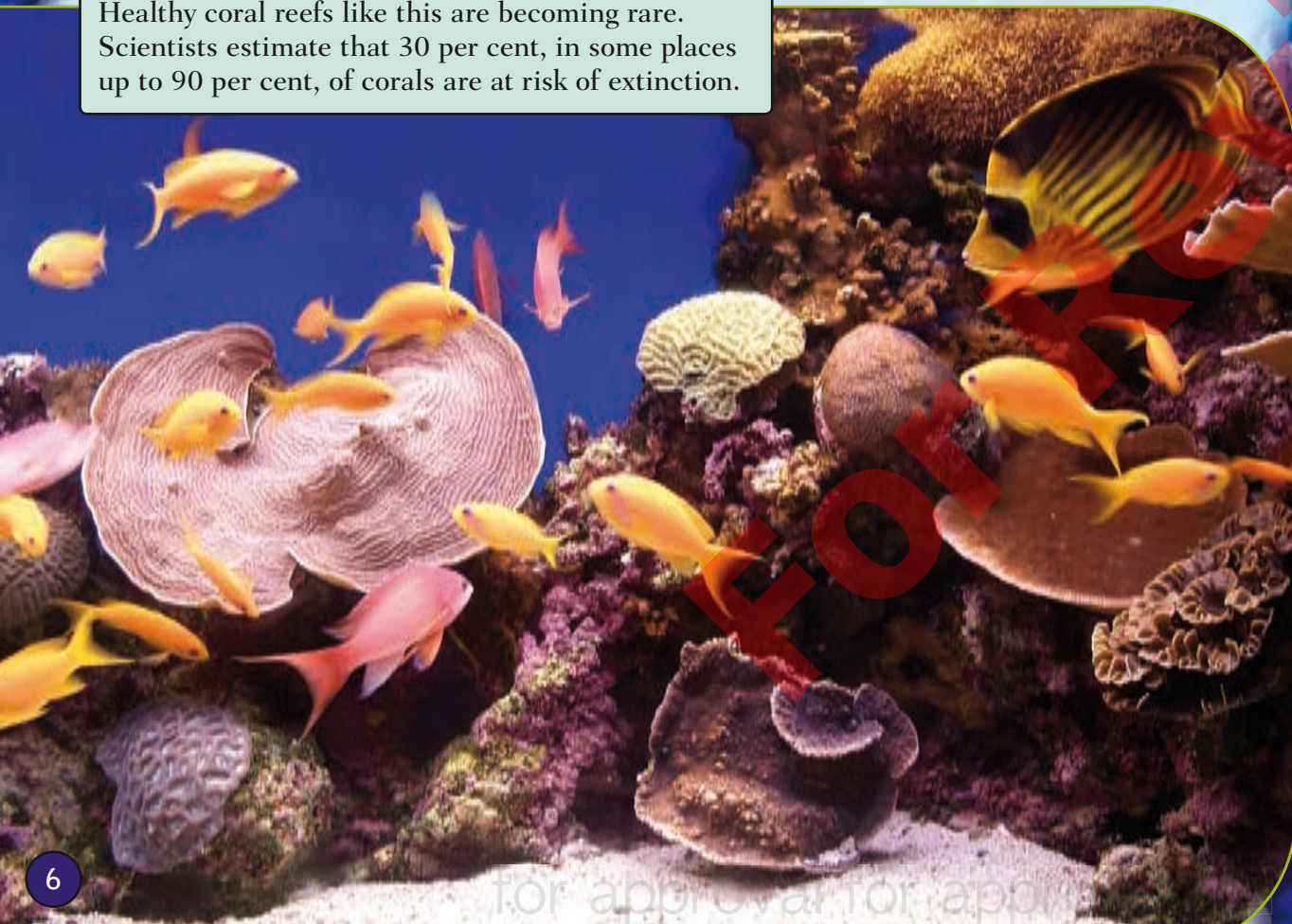


Coral Reefs under Threat

Corals need specific conditions to thrive. This makes them vulnerable to changes. Tropical corals need warm salt water that is 20–30 degrees Celsius. They need plenty of light. The water must have a lot of oxygen, too. Many corals live in shallow water. The corals' algae have access to more light there. The water is also rich in oxygen because it moves a lot.

Any changes to these conditions can have terrible effects on a coral reef. Some threats, such as tsunamis, are natural. Other threats, such as overfishing, come from humans. People are causing most of the damage to the world's reef systems. Pollution, temperature changes, and harmful fishing methods threaten many coral reefs. It is possible that what took thousands or millions of years to build up may be wiped out in less than a century.

Healthy coral reefs like this are becoming rare. Scientists estimate that 30 per cent, in some places up to 90 per cent, of corals are at risk of extinction.



Crown-of-Thorns Starfish

Most species in nature have a natural predator. It is no different in the sea. In the Pacific and Indian Oceans, the natural predator of the coral reef is the crown-of-thorns starfish. The crown-of-thorns starfish eats coral polyps. Normally, this starfish is a natural, healthy part of life on the reef. Sometimes, however, crown-of-thorns starfish numbers grow rapidly. Then, the starfish end up eating too many corals too quickly.

In recent decades, crown-of-thorns starfish outbreaks have caused massive damage to reefs from Australia to Hawaii. It is not entirely clear why these outbreaks occur. A mixture of things may be to blame. The sharp increase in numbers could be part of a normal cycle that occurs naturally every few years. Overfishing may have reduced the number of reef species that prey on the crown-of-thorns starfish. Pollution could also be a factor.

All the living things that interact with each other and their environment make up an ecosystem. Anything that upsets this balance may have devastating results for the entire ecosystem of a coral reef. Crown-of-thorns starfish outbreaks are another example of the delicate balance that exists on the coral reef.

A crown-of-thorns starfish can have up to 21 arms and grow up to 80 cm in diameter.

