

Coral reefs—plant or animal?

Coral reefs are made up of millions of individual animals called coral polyps. These give reefs their structure. One of the features of coral is the way it is able to get energy from the Sun through algae called zooxanthellae. This is one of the special relationships that exist in all reef environments.

BUILDING BLOCKS OF THE REEF

Coral polyps

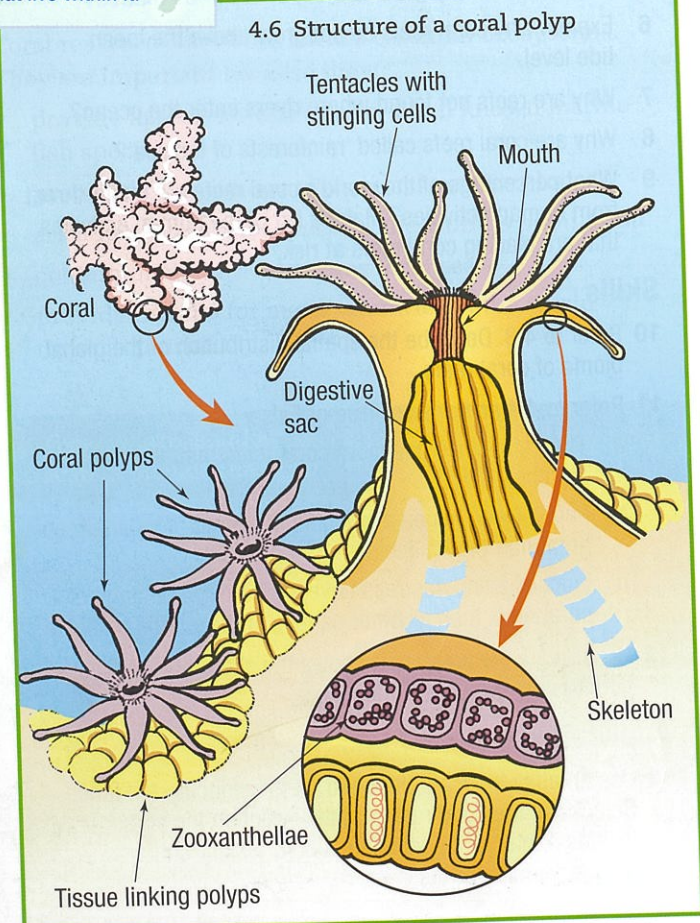
The basic building blocks of the coral reef are coral polyps. Coral polyps have clear bodies and white skeletons. The calcium carbonate on coral reefs is actually the skeleton of coral polyps, or more correctly the materials left behind by coral polyps as they grow. This calcium carbonate gives the coral their shape. The polyps feed off zooplankton, tiny animals that are in reef waters.

GEOGRAPHY FOCUS

Up to 90 per cent of the nutrients needed by the coral polyp to grow actually come from the zooxanthellae algae that live within it.



4.5 Soft corals lack the structure of harder corals but still form an important part of the reef ecosystem.



4.6 Structure of a coral polyp

Zooxanthellae

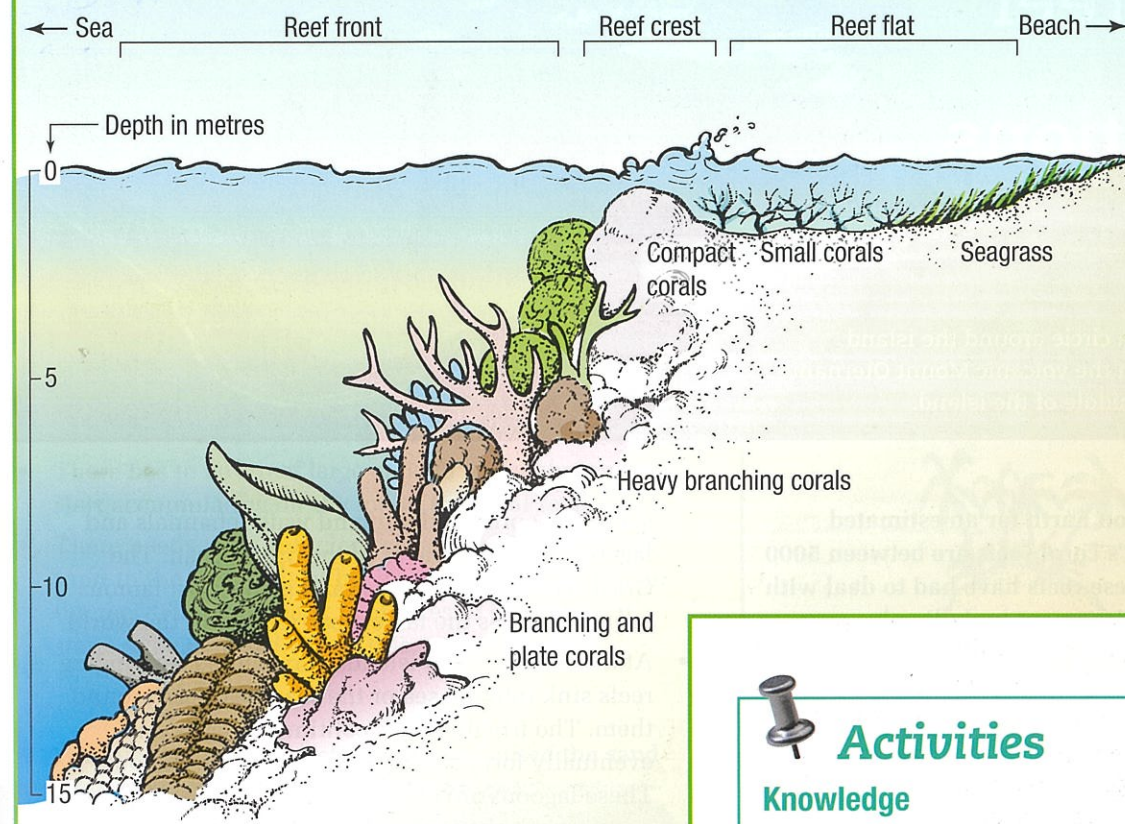
Zooxanthellae are algae that actually grow in the coral polyp. Algae require sunlight to grow. It is algae that give coral polyps their huge range of colours. Millions of zooxanthellae algae live within just one square centimetre of coral (see 4.6).

Symbiotic relationship builds reef

Nutrients in the waters around coral reefs must be low or else the coral will die. This is unusual because coral reefs are one of the most productive environments on the planet. The way nutrients are cycled around makes coral reefs unique.

Coral polyps and the zooxanthellae have a symbiotic relationship. Each organism benefits the other—the wastes of the polyp are used by the zooxanthellae to grow, and the wastes of the zooxanthellae are used by coral polyps to grow. As zooxanthellae are plants and coral polyps are animals, it is actually the zooxanthellae that are at the base of the coral reef food web.

4.7 Structure of a coral reef



4.8 Hard corals are often named from their shape—the common brain coral and table or plate coral.

TYPES OF CORAL

There are two different types of coral: soft and hard.

- Soft corals form in the still waters of the reef ecosystem. They look like plants as they sway in the ocean currents, and are sometimes called sea fans. They secrete small amounts of calcium carbonate that helps them attach to the reef. Soft coral polyps always have eight tentacles.
- Hard corals are the reef-building type. Hard corals give a coral reef its structure. As the coral polyps grow, they form skeletons of calcium carbonate. Various corals grow differently, and the shape of each different type is often what gives the coral its name. It takes years for the millions of coral polyps that form a colony to build the coral reef. Hard coral polyps can be identified by the number of tentacles they have. It is always a multiple of six.

THE REEF'S STRUCTURE

Different types of coral form in particular parts of the reef that are most suited to their features. Compact types, such as the brain coral, are found in areas of high wave energy, while the branching and plate corals are found in deeper water. The smaller, finer corals are found in shallow lagoon areas.

Activities

Knowledge

- 1 What is zooxanthellae and why is it important to coral reef ecosystems?
- 2 What are coral polyps and what do they feed on?
- 3 What material is the coral polyp's skeleton made out of and why is this important for reef building?
- 4 What is a symbiotic relationship?
- 5 Explain the symbiotic relationship between coral polyps and zooxanthellae and describe how important this is to coral reefs.
- 6 How are calcium carbonate and coral type linked?
- 7 Compile a table to show the comparison between hard and soft corals using these headings: Features, Polyp tentacles, Brief description. Include a sketch of each type in your table.

Skills

- 8 Refer to 4.6 to draw an annotated diagram of a piece of coral showing the calcium carbonate skeleton, the coral polyp and the location of the zooxanthellae.

Application

- 9 Imagine you are a diving instructor about to take a group of tourists into the coral reef environment for the first time. Using the pictures and diagrams in this unit:
 - a Describe to them what they can expect to see as they enter the water.
 - b Describe how to identify the different types of coral and where to expect to see the corals on the reef.
 - c Explain why the reef will be so colourful.