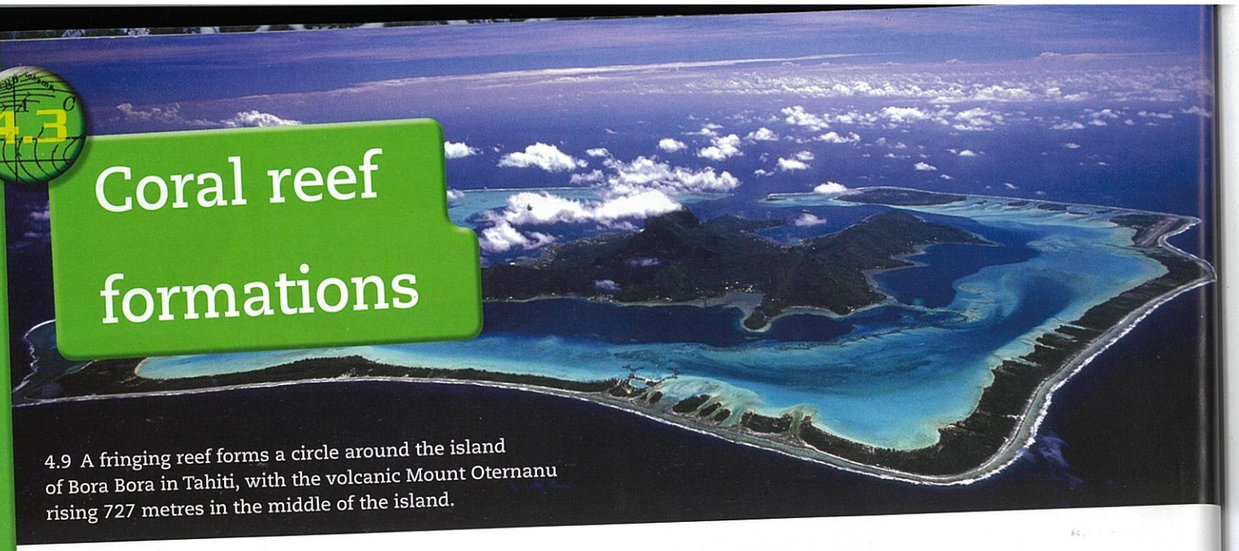
4.3

Coral reef formations



4.9 A fringing reef forms a circle around the island of Bora Bora in Tahiti, with the volcanic Mount Otemanu rising 727 metres in the middle of the island.

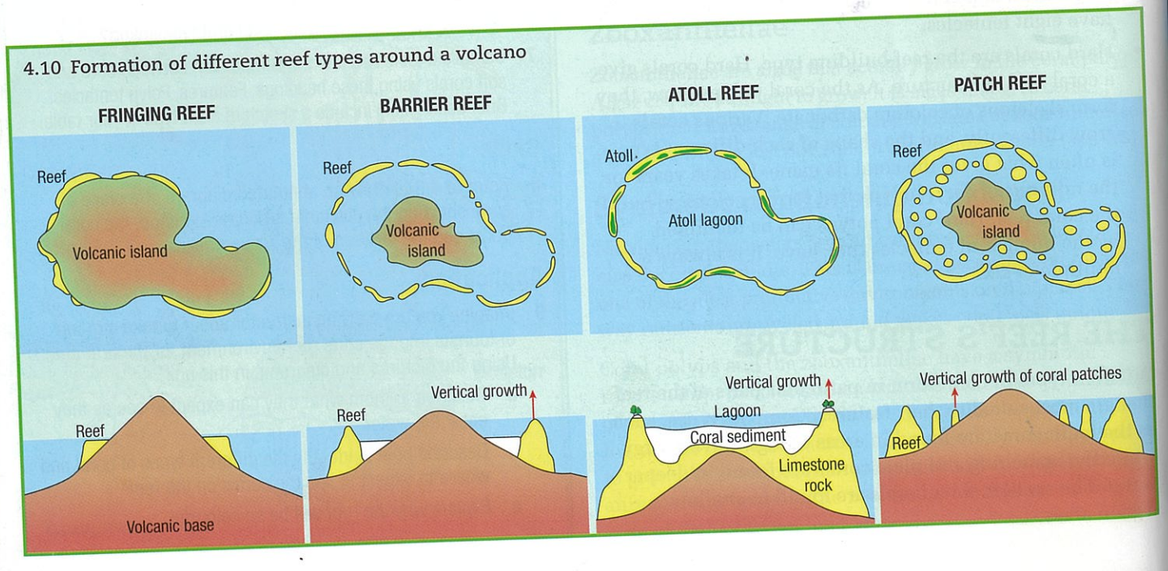
Coral reefs have existed on Earth for an estimated 350 million years. Today's coral reefs are between 5000 and 10 000 years old. These reefs have had to deal with many changes in the environment including ice ages and sea level changes. As the reef is a living organism, it grows in a particular way.

TYPES OF REEF

Geographers classify coral reefs into four main types as shown in 4.10.

- Fringing reefs—Grow near the coastline around islands and continents. They are characterised by a coral reef separated from the shore by a narrow, shallow lagoon or channel. Fringing reefs are the most common type of reef.
- Barrier reefs—Located parallel to the coastline, but are separated from it by deep, wide lagoons and channels. Usually found along the edge of the continental shelf, they protect the inland water channels and lagoons from the waves of the open ocean. The Great Barrier Reef in Australia is the most famous example and is the largest barrier reef in the world.
- Atolls—Form when islands surrounded by fringing reefs sink into the sea or the sea level rises around them. The fringing reefs continue to grow and eventually form circles that enclose the lagoon. These lagoons are connected to the open ocean by one or more channels. The majority of the coral atolls are found in the Pacific Ocean.
- Patch reefs—Small, isolated reefs that grow up from the bottom of the island platform or continental shelf. They usually occur between fringing reefs and barrier reefs. They vary greatly in size, and rarely reach the surface of the water. If they do reach the surface, a small coral cay may form (see page 89).

4.10 Formation of different reef types around a volcano



CORAL CAYS

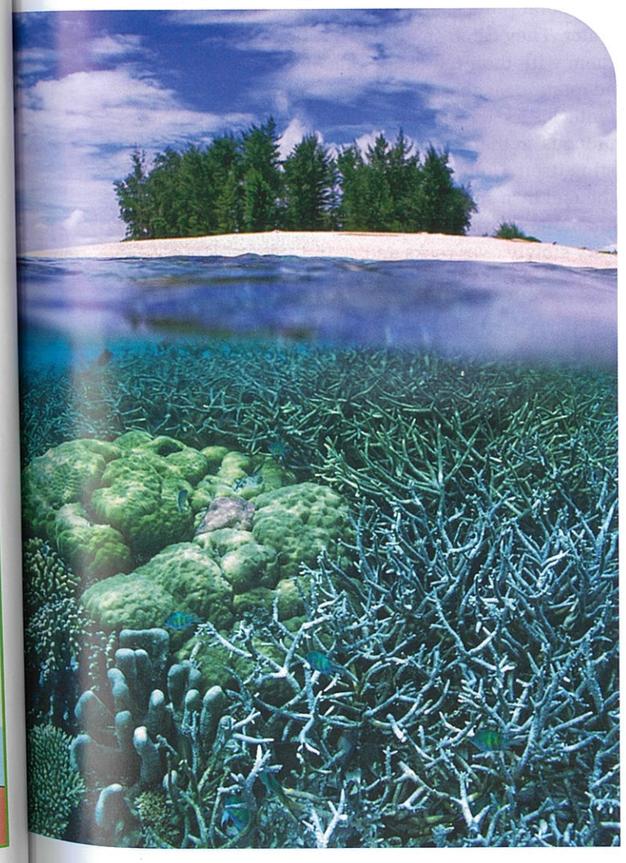
When waves break against coral reefs the energy from the waves causes pieces of coral to break off. These coral pieces bump into each other and eventually the pieces are so small that they form coral sand. With the right ocean currents this sand will be deposited on top of the coral reef in the area of still water that is sometimes exposed at high tide.

Usually sand deposited on top of the coral reef will be washed away. If the sand does start to accumulate then there is a chance that a coral cay will develop (see 4.12). A coral cay is a sand island located on the top of a coral reef that is usually covered in vegetation.

A coral cay develops in the following stages.

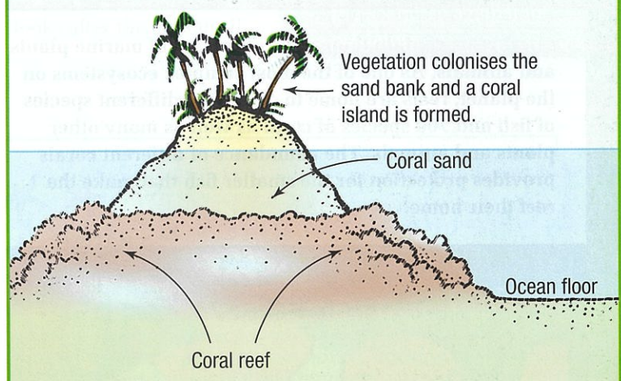
- There has to be a reef large enough to enable sand to start accumulating on the top of the coral reef.
- There needs to be sufficient ocean currents to bring sand to the reef area so that a sand bank will form on the reef. This sand bank continues to grow until it starts to be exposed at low tide.

4.11 A coral cay where vegetation has stabilised the sand



- Birds start to rest on the island as it is exposed at high tide. Their droppings contain seeds that are able to germinate because of the nutrients in their droppings. Sand continues to accumulate on the island and other plants make their way to the reef on the ocean currents.
- Vegetation on the island eventually stabilises the sand and a coral cay forms. Coral cays are only just above the high tide mark and during severe storms like tropical cyclones the ocean can wash completely over them.

4.12 Formation of a coral cay



Activities

Knowledge

1 How old are the coral reef ecosystems that exist today?
2 Name two environmental changes that today's coral reefs have adapted to.
3 Name and describe the four main types of coral reefs.
4 What are coral cays and what are they made of?
5 Explain the steps in the formation of a coral cay.
6 What limits the growth of the vegetation on a coral cay?

Skills

7 In your notebook, draw an annotated diagram to explain the features of the following types of coral reefs:
a fringing reef **b** barrier reef
c coral atoll **d** patch reef.

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