STUDENT SHEET 3a

Abiotic and biotic factors

Nutrient cycle in coral reefs

Coral reefs occur in tropical areas where the water is shallow and warm. These areas tend to be low in nutrients. So how do corals survive so successfully?

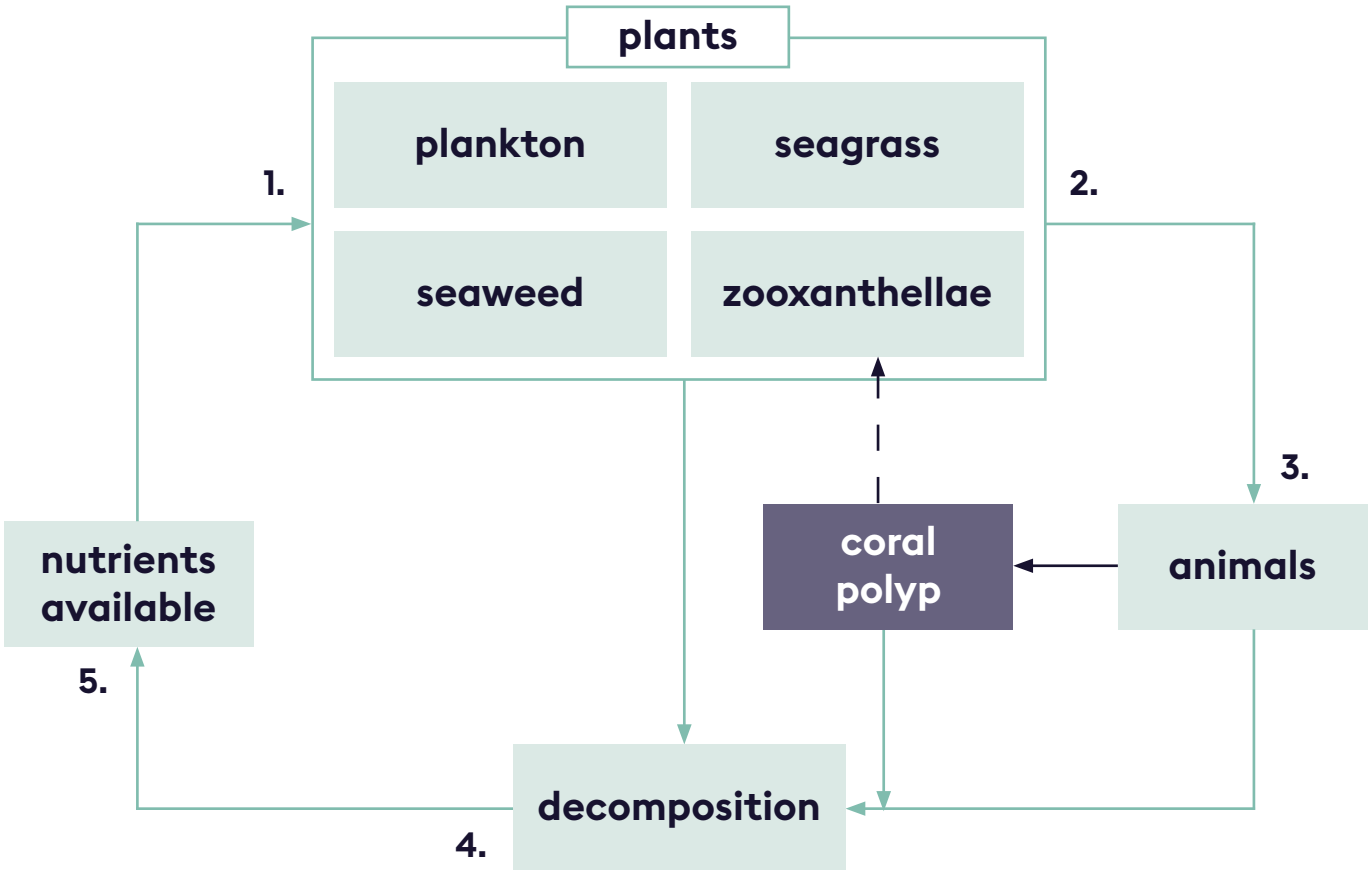
There are two potential sources of new nutrients in for coral reefs. The first being run-off from fertilizers which is washed off land or when coral reefs are located near volcanic islands they may receive high levels of nutrients.

The second source being from the ocean itself when it flows over the reef. There are several conditions which will affect the amount of nutrients the coral reef can absorb from the water.

The conditions include but are not excluded to; the concentration of nutrients in the water, the primary producer's ability to absorb the nutrients from the ocean and the speed of flow of water over the reef.

The key to the success of the coral reef is the 'tight recycling of nutrients' and that is down to the symbiosis of plants and animals living closely together. For example, some algae live inside the coral polyp and harness energy from sunlight and photosynthesize. The waste produced in this process is then available for the coral polyp to utilize.

Coral reef nutrient cycling



1. 'Plants' absorb nutrients from the water column and sediment.

2. There are a wide variety of producers on the reef, including plants (e.g. seagrass), microalgae (e.g. phytoplankton), macroalgae (e.g. seaweed) and algae inside coral tissue (zooxanthellae). We have used 'plants' as shorthand to include all plants and algae.

3. Animals eat plants and other animals.

4. Decomposers such as bacteria break down waste and dead 'plants' and animals.

5. Nutrients are made available from waste in the water column and released from decomposition in the sediment.

Symbiotic relationships also play a role in the nutrient cycle. Sugars from zooxanthellae pass straight to the coral polyp and nutrients pass the other way.