

## Algae



### What are Algae?

Algae are a large and successful group of organisms, which flourish in the sea, in fresh-water and in damp places on land. Most algae contain green chlorophyll, and can produce foods, such as sugars, from the sun. Although they seem plant-like, scientists have classified them in a group of their own, outside the plant kingdom. They have been classified in a separate kingdom called Protista.



Whereas plants always have specialised reproductive structures made up of many different types of cell, algae do not.

Algae reproduce by using little **spores**, or by growing copies of themselves from buds or broken-off fragments.

Algae can be lively little characters, even though they are not animals. Many are made of a single cell, and cannot be individually examined without a microscope. Many of these little algae can swim. Some, called **Dinoflagellates**, have little whip-like structures (flagella), which pull them through the water. Some algae squish part of their body forwards and crawl along solid surfaces.

Some algae are made of fine filaments, with cells joined from end to end. Some of them clump together to form colonies. Others, like many seaweeds, are very large and grow in the shape of tubes, clubs and trees. These large algae have thick root-like structures, called "holdfasts" which can cling onto rocks.

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## Where do Algae Live?

Tiny algae can be found floating or swimming in lakes and seas. Large seaweeds can stretch from the ocean bottom to the water's surface.



Most algae are found in fresh water or seawater, but they can also be found growing on soil, trees and animals. They can even grow inside rocks.

Algae can withstand boiling hot as well as freezing cold temperatures. Such algae can be found growing in hot springs, in snow-drifts or deep down inside polar ice.



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## Are Algae Important?

Algae are extremely important. They produce more oxygen than all the plants in the world, put together. They are also a very important food source for tiny animals such as little shrimps and huge animals like whales.

Because algae are at the bottom of the food chain many living things depend upon them.



## How do Algae Feed ?

There are different type of algae, and they feed in different ways:

### Autotrophic Algae

Most algae use the sun's energy to create food such as sugars, through the process of **photosynthesis**.



### Symbiotic Algae

These types of algae form close relationships with other organisms. Both organisms benefit from living with each other. For example, **lichens** are an association between algae and **fungi**.

Another such relationship exists within the reef-building coral. Coral cells are mostly animal cells. But little algae live inside the cells of such corals, providing oxygen and nutrients to their coral partner.

### Saprophytic and Parasitic Algae

Some microscopic algae are unable to create their own food using the sun's energy. These algae have to eat food from their surroundings.

They can absorb nutrients across their surface, or even engulf whole particles. **Dinoflagellates** - stick out a feeding tube to suck in food. Amazingly, some even use little harpoons to gather food particles.

Some algae are parasites - living inside or on the outside of a plant or animal, from which they take food. For example, some **Dinoflagellates** live in the intestines of marine animals.



## How do Algae Reproduce?

Algae can reproduce by the use of **spores**. In large algae, the spores sometimes grow inside swollen ends of fronds which burst when ripe.

Sometimes these spores are produced by the fusion of male and female cells (**sexual** reproduction). Others form spores using just their own cells (**asexual** reproduction). In seaweed, the spores escape into the surrounding sea, settle on rocks or other seaweeds, and grow into individuals. Some spores, known as zoospores, move around using little whip like flagella.

Single-celled algae can reproduce simply by splitting themselves into two new individuals. Larger algae sprout little buds, which grow into new algae, in what is known as **vegetative** reproduction. Similarly, some algae, like *Sargassum*, broken fragments of the adult algae can grow into new individuals.



## Amazing Algal Uses

Algae:

- provide food for people and cattle. They contain high levels of protein, minerals and vitamins

- thicken shampoo and ice cream
- fight disease
- are used as fertiliser, improving crops (algae increase rice production by ten times)
- help to make paint and syrup smooth
- are used to make gels useful for scientific research
- supposedly cure all sorts of illnesses including coughs, gout and diarrhoea
- may help the human body to fight cancer

## Algae and Eutrophication

(sounds like "you-tro-fick-a-shon")

This is when water contains too much algae, causing serious problems to other living things. Follow these steps to see how it happens:

1. Pollution from, for example, fertiliser, washing up liquid or sewage, fill the water with too many nutrients.



2. Algae flourish, causing an algal bloom.



3. Algae make the water thick and turbid.



4. Light can't penetrate to bottom-dwelling plants.



5. Algae, with their short life cycle, soon die. Bottom dwelling plants die due to lack of photosynthesis.



6. Oxygen in the water is reduced because of the lack of photosynthesis.



7. Dead plants are decomposed by bacteria. The bacteria use up

oxygen, and further reduce oxygen in the water.



8. Animals, including fish, die due to lack of oxygen.

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