Green Algae
Phylum Chlorophyta

- photosynthetic (autotrophic)
- aquatic environments generally
- can be unicellular, colonial or multicellular
- lack vascular tissue (for transport of H_2O and nutrients)
- rely on diffusion across cell membranes for distribution of materials in their tissues (limits size)

Distribution of Nutrients
Non-vascular transport.
Occurs in algae.
Diffusion of water and sugars occurs directly across the cell membrane

Examples of Different Types of Algae

- **Unicellular**
  eg. Chlamydomonas
- **Colonial**
  eg. Volvox
- **Multicellular**
  eg. Ulva, Spirogyra, Oedogonium

Unicellular Algae

- Single celled plants
- eg. Chlamydomonas
  - grows in ponds and moist soil
  - small oval shaped cell with two whip like flagella
  - large cup shaped chloroplast
  - acts as a link in the evolution of multicellular plants and unicellular protists

Colonial Algae

- Group of cells that are joined together and show few specialised structures
- Each cell still functions independently
- eg. Volvox
  - forms large colonies
  - all the cells in the colony are connected by cytoplasmic strands
  - a few cells have specialised reproductive functions

Multicellular Algae

- Groups of cells working together, with individual cells having specialised functions
- Have cellulose in their cells walls
- Most complex algae
- eg. Ulva, Spirogyra, Oedogonium

Structures

- lack stems, leaves and roots (terms reserved for vascular plants)
- **HOLDFAST**: anchoring device
- **BLADES**: leaf-like structures
- **STIPES**: stem-like structures

Adaptations

- aquatic plants do not require some of the specialized structures for life on land
- no vascular tissue: water bathes plant in nutrients and carbon dioxide, plant relies on diffusion
- no support: plants float in water, no need for true stem (sometimes have floats)
- do not dry out: leaves can be thin and unprotected
- reproduction: motile reproductive cells swim through water
- large surface area to increase photosynthetic surface

Chlorophyll

Chlorophyll

- the light absorbing pigment for photosynthesis
- requires specific wavelengths of light
- seawater absorbs red and violet

Chlorophyll

Adaptations:

- algae have evolved to deal with the lack of red and violet light

1. different forms of chlorophyll which absorb different wavelengths of light

à examples: green algae (chlorophyll a and b), red algae (chlorophyll a and d), brown algae (chlorophyll a and c)

1. Accessory Pigments: absorb different wavelengths of light and pass energy on to photosynthetic machinery

** these 2 adaptations allow algae to survive in deeper water