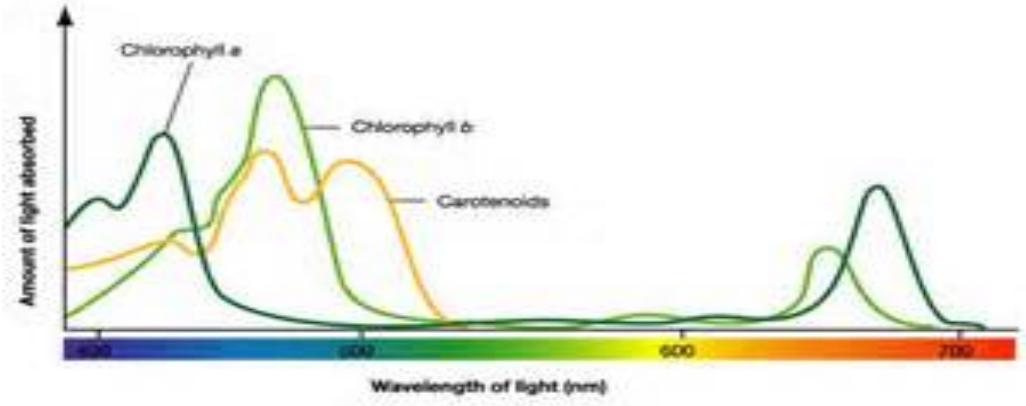
Aquatic Plants - 3 Phyla

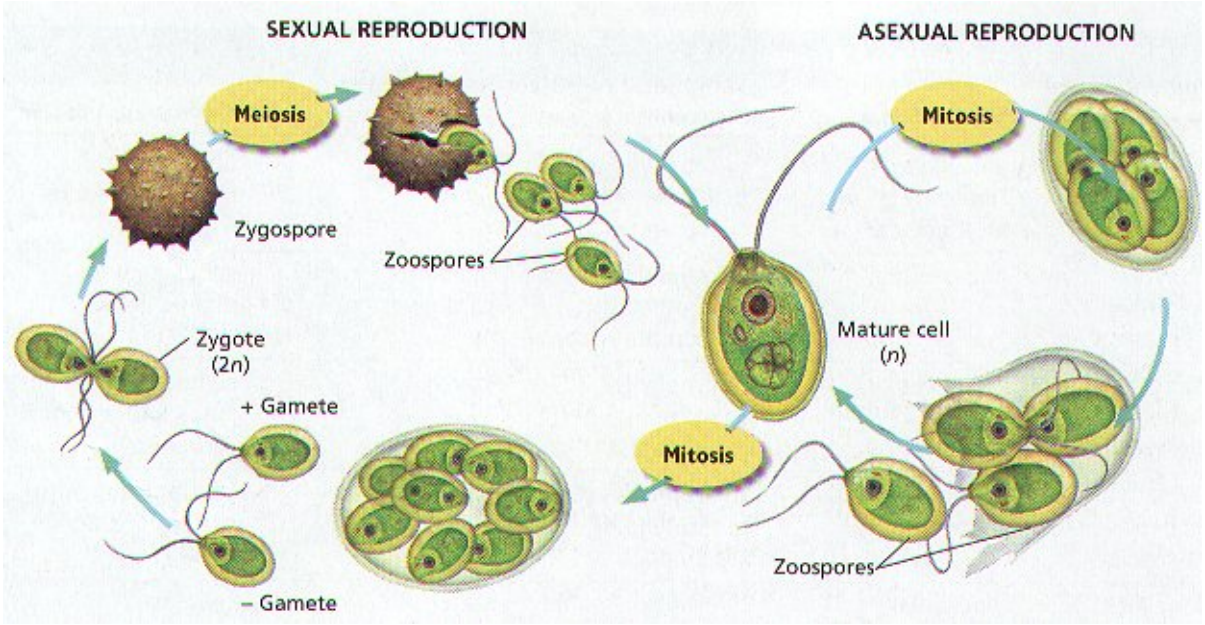
Phylum Chlorophyta (Green Algae)

- All have cell walls made of cellulose
- All have alternation of generations
- This phylum most likely gave rise to land plants
- Chlorophyll a is common to all 3 phyla of aquatic plants.



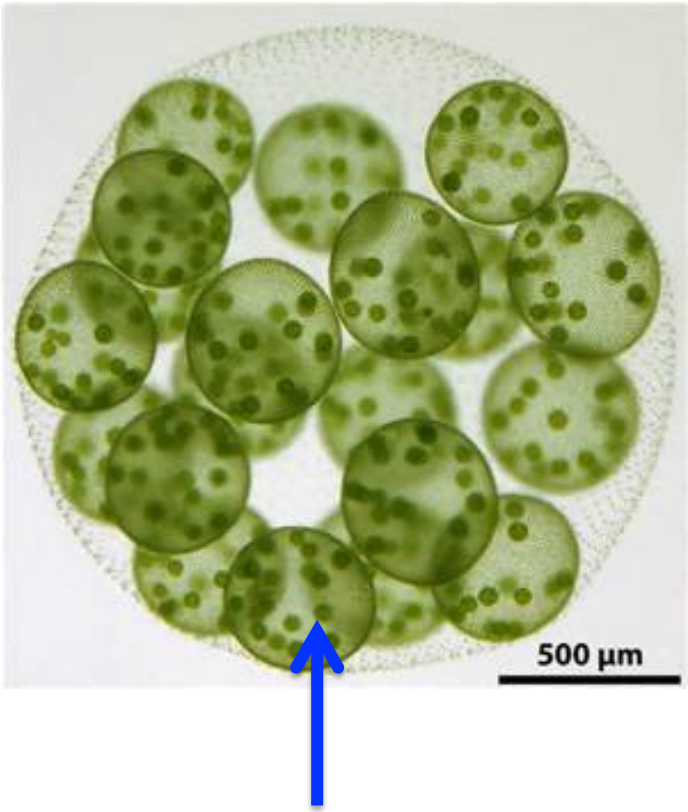
Unicellular Algae – Ex) *Chlamydomonas*

- ***Asexual reproduction*** – forms zoospores through mitotic division.
- ***Sexual reproduction*** – isogametes fuse to form a zygote = **isogamy**



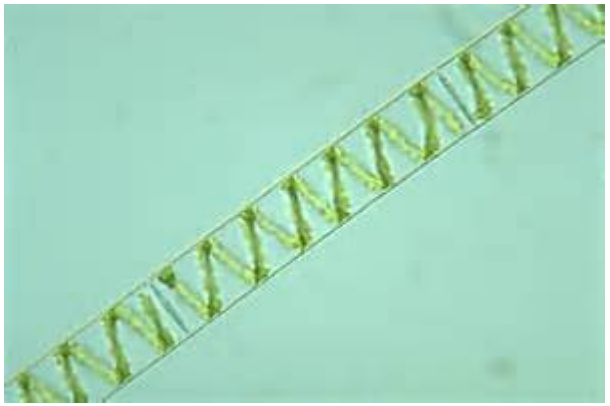
Volvox

- *Volvox* is able to move due to the synchronized beating of the individual flagella that enables the sphere to move forward.
- *Volvox* is a colonial algae, made up of many individual cells that function as one unit.
- *Volvox* undergoes sexual reproduction where a few cells form eggs and others form sperm = **heterogamy**
- *Volvox* also undergoes asexual reproduction where vegetative cells divide to form daughter colonies, which stay within the parent colony.



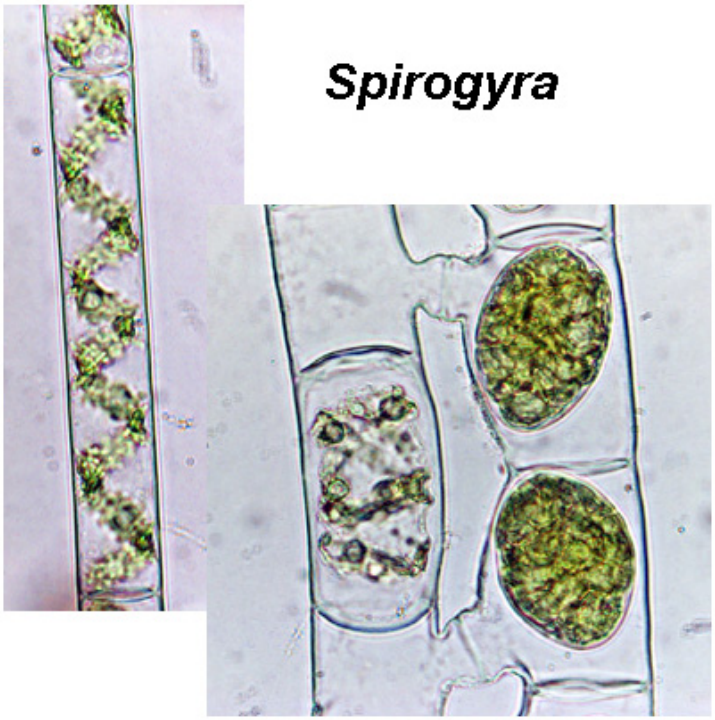
Filamentous algae (chain of cells = multicellular)

Ex) *Spirogyra*



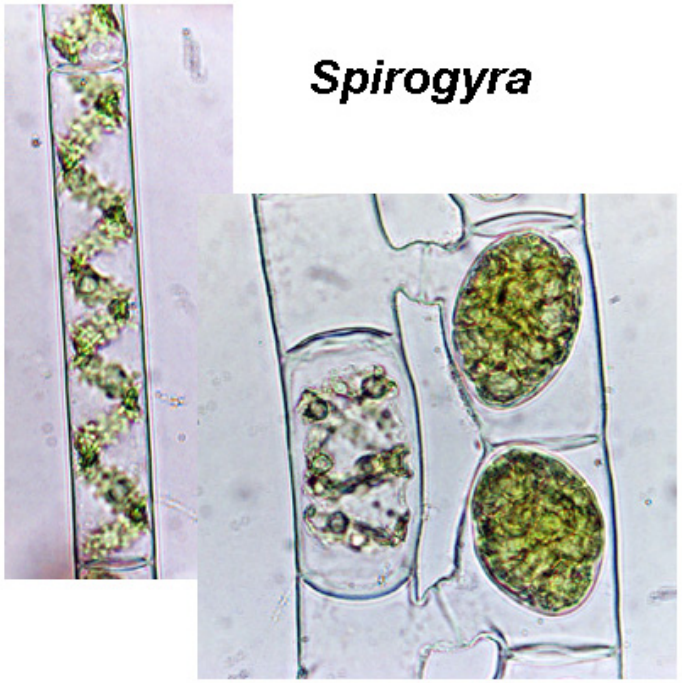
- **Asexual reproduction** = mitosis or fragmentation

- **Sexual reproduction** = **conjugation** where isogametes fuse to form a zygote.

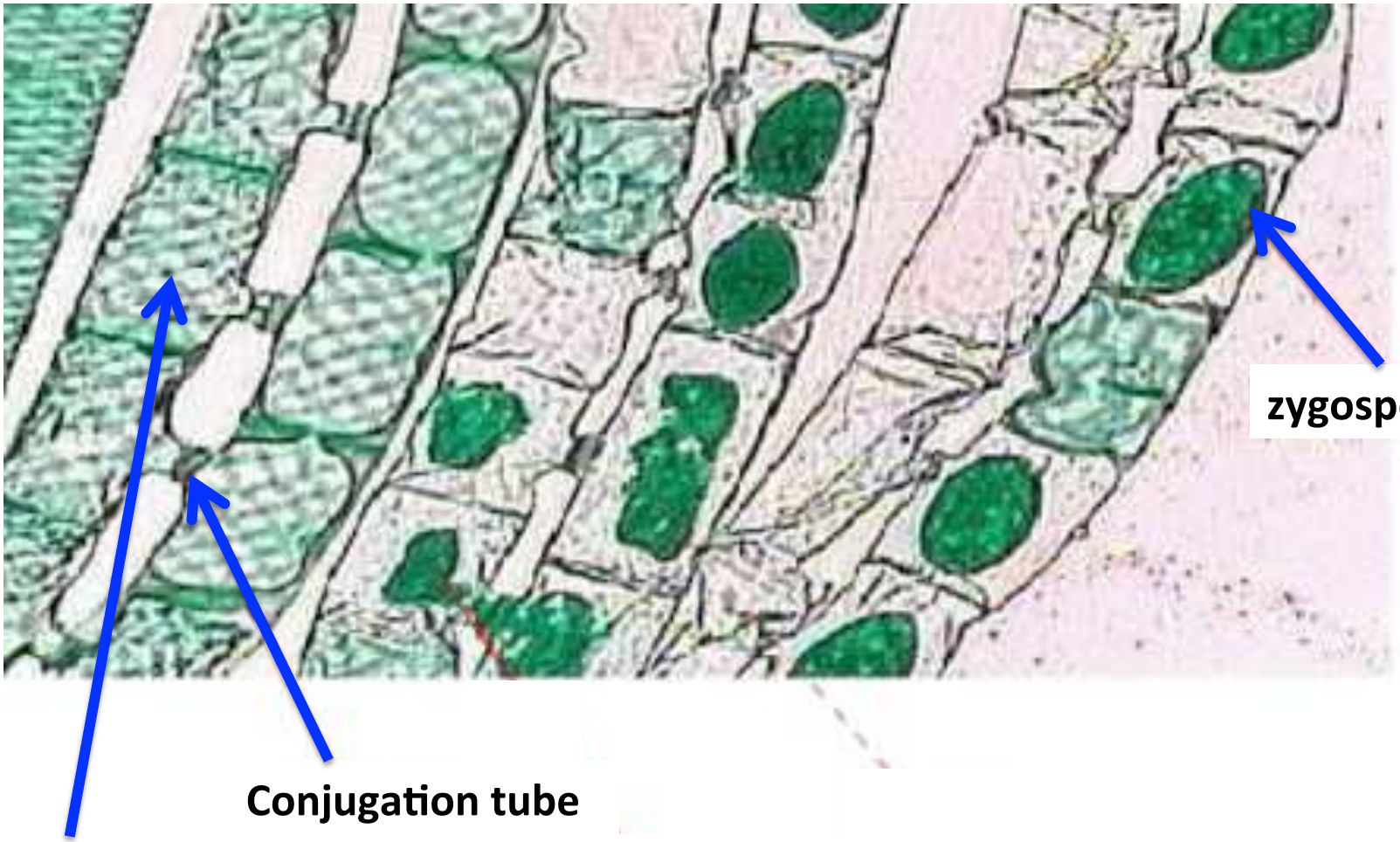


Spirogyra

- **Conjugation**
  - A **conjugation tube** develops to join 2 different cells together.
  - The **nucleus** of the left-hand cell winds up & fuses with the nucleus of the right-hand cell (isogametes).
  - These fused isogametes form the **zygospore**.



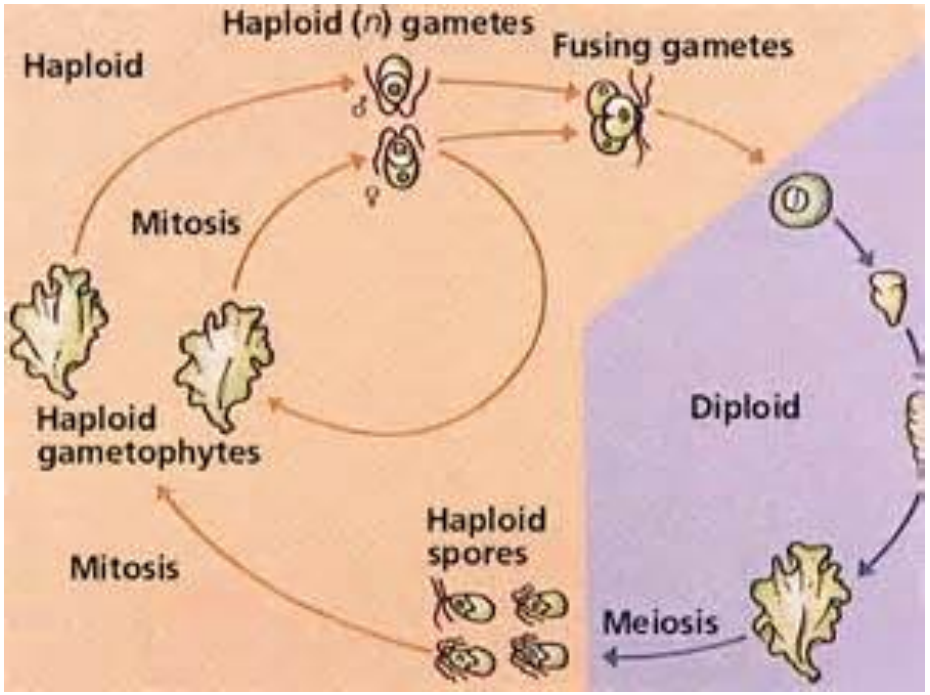
Spirogyra undergoing conjugation



Multicellular Sheets Ex) ***Ulva*** (sea lettuce)

- **Asexual reproduction** = releases haploid spores by meiosis.

- **Sexual reproduction** = **isogametes** fuse to form a zygote.



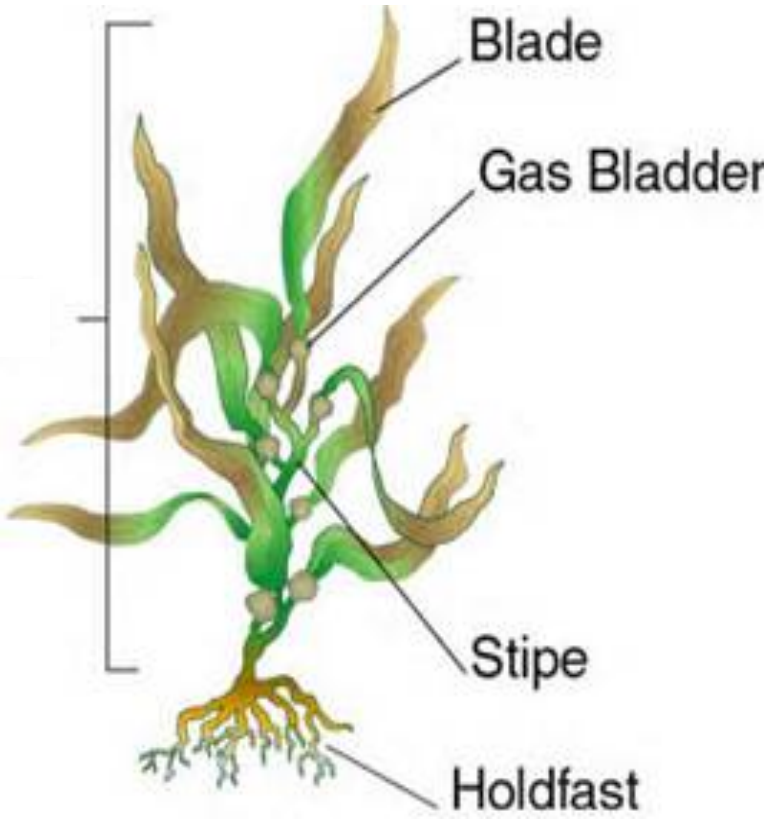
Phylum Phaeophyta (Brown Algae)

Ex) *Fucus*

- Has accessory pigments
- Multicellular
- **Asexual reproduction** = fragmentation or spores
- **Sexual reproduction** = heterogametes, egg and sperm, fuse to form a zygote = **heterogamy**

- **Blades** are the **leaf-like** structures.
- **Holdfast** is the **root-like** structure.
- **Stipe** is the **stem-like** structure.
- The name given to the gas-filled structures which provide floatation and hold the plant upright is **gas / air bladders**

➔These structures also hold the blades closer to the surface of the water so they can get more direct sunlight for photosynthesis.



Brown algae = kelp

Phylum Rhodophyta (Red Algae)

- Has accessory pigments
- Multicellular
- **Asexual reproduction** = fragmentation
- **Sexual reproduction** = gametes fuse to form a **zygote**

Order Algae is found on the shoreline

- **Green** algae are found on and *near the shore*.
- **Brown** algae are found on the shore and *in deeper water*.
- **Red** algae are found *in the deepest water*.

Brown and Red algae are commonly called **seaweed**.