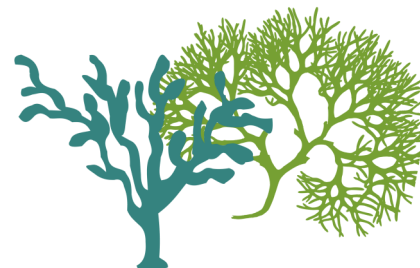


VIDEO 2. How Algae Live And Grow

What do algae look like?

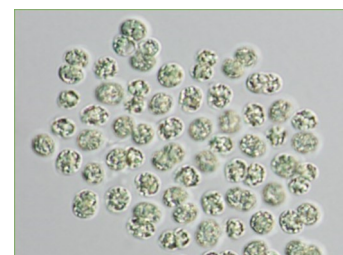
- Algae can be microscopic to large enough to see with the naked eye.
- Phytoplankton are:
 - Microscopic algae that live dispersed in the water;
 - Usually buoyant, free-floating, and move with currents but some can be individually motile;
 - Microscopic, but millions of cells together can be seen with the naked eye.
- Periphyton:
 - Are a mat made of algae, bacteria, and other microscopic organisms that attach to surfaces under the water;
 - Can be seen as floating mats or growing on plants, even though the individual algae are microscopic.
- Macroalgae:
 - Are algae made of multiple cells and visible to the naked eye;
 - Can grow attached to surfaces beneath the water or float freely if they become detached.



How do algae grow?

Algae require sunlight, water, select nutrients, and carbon dioxide to grow through photosynthesis.

- Photosynthesis
 - Algae absorb sunlight using chlorophyll a and other pigments stored within the algae. Through photosynthesis, algae create sugars called carbohydrates from the dissolved carbon dioxide in the water, giving algae energy to live and grow.
 - Some algae have photosynthetic adaptations to capture the optimal amount of sunlight including:
 - Additional pigments that result in algae of different colors;
 - Gas-filled vesicles in cyanobacteria to regulate buoyancy to maximize light capture;
 - Light-sensing eyespots in some green algae species to swim towards the light.
- Nutrients
 - All algae require nitrogen, phosphorus, and trace elements.
 - Diatoms also require silica.
 - Some cyanobacteria can fix atmospheric nitrogen from the air dissolved in the water and convert it to ammonia.



Green algae
 Photo credit: Barry Rosen

References

Photosynthesis - Photosynthetic Adaptations

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- Schirber, M. (2013, March). [Synopsis: Swimming into the light](#). *APS Physics*.

