

Workshop: Phytoplankton compositions and different Baltic Sea living conditions

Phytoplankton are drifting or weakly swimming organisms that cannot move against water currents. How can they control their buoyancy and float in the upper part of water column without sinking ?

- 1) Read about phytoplankton.
- 2) Run the experiment in groups of 2-3 students and answer all given questions.

Worksheet 1: Background Information

Phytoplankton are microscopic plants that live in the ocean, sea, lake, or other body of water. Like all plants, they convert nutrients into plant material by using sunlight with the help of the green pigment chlorophyll. Very abundant phytoplankton include the diatoms and dinoflagellates. Phytoplankton play an essential role in the global carbon-cycle. During photosynthesis phytoplankton remove carbon dioxide from sea water, release oxygen as a by-product, and store the carbon in the form of organic materials. When too many nutrients are available, phytoplankton may form harmful algal blooms. These blooms can produce extremely toxic compounds that have harmful effects on marine organisms and even people.

All plankton must avoid sinking. Phytoplankton need sunlight for photosynthesis, so they must stay within the photic zone, usually the top 100 meters. Zooplankton depend on phytoplankton and other zooplankton for food, so they must avoid sinking as well. Plankton avoid sinking by increasing their surface area and/or decreasing their density. Most plankton are quite small and therefore have a larger surface area to volume ratio than do larger organisms. Flattened bodies and appendages, spines, and other body projections also slow sinking by adding surface area without increasing density. Some diatoms resist sinking by forming chains. The use of low-density substances like oil or fat helps increase buoyancy and can serve as food reserves. In addition, water currents caused by convection and upwelling can stir the water and help to keep plankton from sinking.

Tasks:

1. Create a phytoplankton science models with the different adaptations used to slow the sinking of plankton.
2. Graph „phytoplankton science models” sinking times on a frequency histogram (or graph sinking rates in cm/sec).
3. We conducted this experiment with fresh water, would there be a difference if we used seawater (salt water)? Why or why not?
4. Why is it important for plankton to sink slowly?

Notes:

Empty rectangular box for notes.



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