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# The lake as an ecosystem

Fieldcourse in naturescience, studenttasks

## Introduction

We are going to explore a lake. Start by making a sketch of it and give a short description. What is it called and where is it located. How big is the lake, in what sort of terrain is it found, and what sort of vegetation is surrounding it?

## Tasks linked to abiotic factors

All plants are depending on light. The photosynthesis is the foundation of all living things in the lake. How deep the light travels in the water (transparency) is therefore important for growth. This distance varies due to the amount of substances dissolved in the water.

* Transparency: by boat, lower the measuring device in the water until the point where you cannot see it anymore. Raise it to the point where you can see it again, and note the depth. Do this in 3-4 locations on the water, and calculate the average transparency.
* Watercolor: lower the device to half of the maximum transparency, decide the color of the device.

Type of lake. In nutrient-poor lakes is the color blue and the transparency 10-20 meters. In a nutrient-rich lake, the color is green and the transparency less than a meter. If the transparency is poor and the color is yellow-brown, this is a marsh lake.

* Make a description of the lake based on your measurements. Does this relate to your first impression?

Temperature and pH measuring

* Collect water samples from different depths. Measure the temperature instantly. Compare the depth and temperature and draw a graphic illustration.
* Describe the graph. Are there any leaps, or is there total circulation?
* Acidity, pH. Measure the pH of the different samples, compare the depth and acidity and draw a graphic illustration.
* Give a short explanation of your findings.

### Weather data: Use the data logger to measure the weather by the lakeside and in the nearby forest. At school you are to compare the two spots and comment on differences. Attach a minimum of one graphic illustration of both temperature and wind speed.

## Tasks linked to biotic factors

Plants. Pick a spot that is representative for the beach vegetation of this lake.

* Make a list of the plants who live: out in the water, in the waterfront, between the lake and the woods, in the woods. Is there a certain flora in each location, or do you find the same plants in more than one of them?

Plant plankton. There are big amounts of plankton in the lake.

* Take a water sample and bring it back to school for further studying under the microscope.
* Make drawings of the species you find, compare to the encyclopedia. What are the mission of the plant plankton in a lake?

Animal plankton. In the sample, you will also find some animal plankton.

* Make drawings and look them up. What is the mission of the animal plankton in the lake?

Inferior animals: In the water, down in the mud and right under the surface we find many insects and other inferior animals.

* Catch some of these and look them up in the field literature. Use the net, lift up rocks, or study the mud by using a sieve.
* Make a list and try to find out if they feed from plankton, plants or other animals.

Fish: find out what kind of fish there are in the water. What do they feed from? Make a list.

Birds: What kind of birds have you seen on, or close to the water? What do the different spices feed from?

Decomposers:

* What kind of organisms are decomposers in this lake?
* What are the tasks of the decomposers?
* What happens to the substances the decomposers produce?

This field course is to be followed by a study of the succession of a lake turning in to a marsh.