

## Water quality in Beverwijk



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## Introduction

We had an exchange with German students. We went together to measure water quality and particulate matter. First we were going to measure the water quality. Mr. Bosshart explained the pH value and what we were going to do. That taught us a lot. Then the five of us, two Dutch and three German, went to Park Assenburg two where we had to fill out a booklet with different kinds of questions about the biodiversity but also how big the lake was. After we completed the booklet we went to collect samples. We caught different kinds of animals with a net. And with cups of water we took samples which we later tested for ph-value. On Thursday we measured particulate matter and were given an explanation by someone from RIVM. Then we had to think of a good question and we decided where we were going to cycle. We measured everything with a meter that you had to mount on your bike.

## Research question

When we were told the assignment, we came up with the research question pretty quickly:

-What impact does the acidity have on the biodiversity in comparison to other locations that have the same or a different pH level?

We came to that question because we had already done something like this in Germany. And we were curious if we will get the same results now. Also, we thought this was a good way to compare locations. We hoped this will give on clear answer.

## Hypothesis

We expect the acidity level is higher at the other location. Because the other location is very close to Tata Steel, Because of Tata steel, there is often graphite rain there and that will increase the acidity. The other location is also very close to a busy road. While at our location it is very quiet with traffic. That is why we also expect the biodiversity to be higher at our site, because it is so quiet and there are very few emissions which can cause a higher pH level. We also think that at our location the pH level will be lower than at the other location.

## Research Method

If you want to do the same research as us you need:

- Fishing net
- Four 50 mm cups
- Petri dish
- Beaker
- Water sample collected in the field 4x
- Nitrate/nitrite test kit

Go to your lake or river and look around you see lots of plants and animals if yes then you know the biodiversity is high around the water. Scoop through the water with the net, scraping gently through the mud at the bottom and around aquatic plants. Rinse out the mud and empty the net into the petri dish. Continue until no new species are caught. Use Google Lens or OBSIdentify to identify species if needed. Repeat at least three times. Count and record the different species and their numbers on a data sheet. When you have done all that, put the pH meter in the water and read the data. Then take samples of water with a beaker that can hold around 50 mm. Then go to a lab



pH meter

petri dish with insect

taking water samples

Fishing net

### Protocol for Measuring the pH of Water

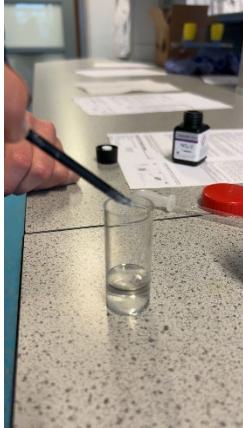
Rinse the beaker twice with the water you are going to measure. Fill the beaker halfway with this water. Rinse the electrode with distilled water and dry it with a tissue. Hold the electrode in the water, ensuring only the glass bulb is submerged. Stir once and wait for the pH value to stabilize. Record the value on the 'Abiotic Water Data Form.' Repeat these steps three times, ensuring all measurements are within 0.2 pH accuracy. Rinse the electrode, dry it, put the cap on, and turn off the device. Calculate the average of the measurements and record this on the form.

### Protocol for measurement of conductivity:

Method of measuring conductivity: Rinse the beaker with the water you are going to measure and fill it up with water completely. Immerse the electrodes in the water. Read the value and record the value on the 'data form abiotic'. Take the average of the different EGV values do that at least three times

### Protocol for measuring nitrate/nitrite levels:

Method for determining nitrate content: Rinse the beaker with the water you are going to measure and fill it up with water completely. Use the manual included in the test kit to determine the nitrate content of the water you collected. Enter the nitrate value found on the data form abiotic – nitrate/nitrite. Conduct the test at least three times and then fill in the average value of the nitrate content in the data form abiotic – nitrate/nitrite. It is possible you have a kit to measure the nitrite content.



### Data/Results

We were group 4 and our location was Assumburg 2 and group 5 and there location was Wijk aan zee. Our hypothesis was: We expect that the acidity level is higher at the other location and the biodiversity is higher at our location. So our hypothesis is true because the pH level is higher what means that there is less acidity, and we have more species so our Biodiversity is also higher. Now we can answer our research question:

-What impact does the acidity have on the biodiversity in comparison to other locations that have the same or a different pH level?

Due to the increased amount of acidity in the water in Wijk aan zee, there are fewer animals there. So now we can conclude that a lower amount of acidity is better for the animals and therefore also for biodiversity

	Clarity (cm)	pH	Conductivity (microSiemens/cm)	Nitrate (mg/l)	Nitrite	Biodiversity (species)	
Group 2		7,5	928,5	<2	0	2	
Group 4		8,6	1081,4	<2	0	5	
Group 5		8,1	1096	10	0,5	4	

## Conclusion

Our study aimed to determine the impact of water acidity on biodiversity in different locations in Beverwijk. By comparing our location (Assumburg 2) with Wijk aan Zee, we hypothesized that higher acidity levels, impacted by proximity to Tata Steel and busy roads, would result in lower biodiversity.

The results confirmed our hypothesis. At Wijk aan Zee, where the water had higher acidity due to industrial graphite rain and traffic emissions, biodiversity was significantly lower. In contrast, our quieter location with fewer emissions exhibited a higher pH level and greater biodiversity. This indicates that water with lower acidity supports a more diverse ecosystem.

These findings highlight the importance of monitoring and managing water quality to preserve and enhance biodiversity. Reducing industrial emissions and traffic pollution can positively impact water quality and biodiversity. This study provides valuable insights into the relationship between environmental factors and aquatic ecosystems, emphasizing the need for continued efforts to mitigate pollution and protect natural habitats.



Our location