Fieldwork assignment ecology - V4

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Content

Experiment 1: Abiotic factors

In this experiment we measured abiotic factors at different parts of the ditch. A couple abiotic factors are for example: temperature, sunlight, CO_2, O_2, wind, rocks, relief en precipitation. The bottom, the side, the middle and on the surface are different kind of places which you can find in the ditch. We have measured the places: the side, the bottom and near plants.

Hypothesis

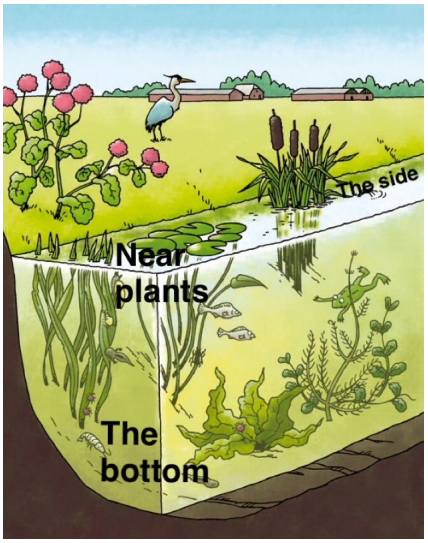
For example at each place the temperature as well as the amount of light or oxygen could be different. We think that the amount of PO4 3- is higher near the plants because plants need fosfor to grow. The concentration of nitrate is expected to be higher near plants because it dissolves easily in water and plants need nitrate as well to live. The temperature and the amount of light should be lower at the bottom then at the side.

Materials and methods + results

- Waterthermometer
- Permeability of light
- Depthmeter
- Greenkits + waste bottle
- Net for waste samples

	The side	The bottom	Near plants
PH	7	7	7
NO3	5 ppm	5 ppm	5 ppm
PO4 3-	2 ppm	1 ppm	1 ppm
Temperature	10 degrees	9 degrees	10 degrees
Light / clairity	20 cm	40 cm	50 cm
Depth	30 cm	60 cm	70 cm

We measured every single abiotic factor with the specific material which is needed. We have chosen to measure the side, the bottom and near plants in the water. On the picture on the right you can see where we have measured the abiotic factors.



Questions afterwards

The quality of the water in the ditch we measured in is depth and clarity (exercise above). It's more accurate to measure every abiotic factor more than once, because it could be a instantaneous photograph or sample which matches (or not) your hypothesis. An abiotic factor is different from place to place, it goes his own way. In

addition, abiotic factor and biotic factors influence each other. Therefore the average of the measures are more accurate because the circumstances and surroundings could be different every time you measure. Organisms that live in the ditch should adapt to their environment and changes, this results in natural selection and survival of the fittest. Lastly filled in these tables to determine the quality of the water with methode 1 with help from www.bioplek.org.

Groups		Amount of species
1	Amphibians	0x
2	Fish exclude stickleback	0x
3	Flatworms	1x
4	Leeches	0x
5	Shellfish, mussels and snails	1x
6	Crustaceans	33x
7	Beetles, larvae and adults	1x
8	Water mites	1x
9	Darter fly larvae	0x
10	Water bugs	0x
11	Water spiders	0x
12	Haften larvae	1x
13	‘Kokerjuffers’	0x
14	Red mosquito larvae	2x
15	Worms	2x
	TOTAL	42

Amount of founded species	**Fill in at tabel A at the end**
0 - 1 species	1
2 - 5 species	2
6 - 10 species	3
11 - 15 species	4
16 or more species	5

Founded Animals		**Fill in at tabel B at the end**
Haften larvae (live in clean water)	more than 1 founded	5
	only 1 founded	4
Larvae from ‘kokerjuffer’ (Live in partly clean water)	more than 1 founded	4
	only 1 founded	3
Flocculates, larvae of dragonflies, snails and mussels (survive a bit of pollution)	If there were spieces founded	3
Water pipe, water beetles and leeches	If there were spieces founded	1
Red mosquito larva Rat tail larvae	If there were spieces founded	0

A: Based on amount of species	B: Based on the indicator groups	Mark quality of water
A = 5	B = 4	A + B = 9

The quality of the water is in particular pretty high. It has a 9 out of 10 rate. The more specific animals are founded the higher the mark will be.

Experiment 2: Present reducers

In this experiment it was all about the visualising of the present bacteria and fungi in the ditch.

Hypothesis

Our hypothesis is to find bacteria and fungi mostly at the side of the ditch, especially at the spots with a lot of plants. We also expect to find them in the mud on the bottom of the ditch. This is because we think bacteria and fungi grow the best in places with a lot of dust particles and phosphates and nitrates from the water plants for example.

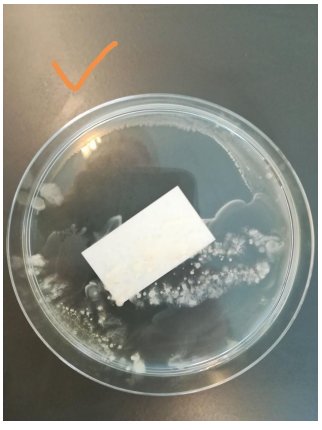
Methods and material

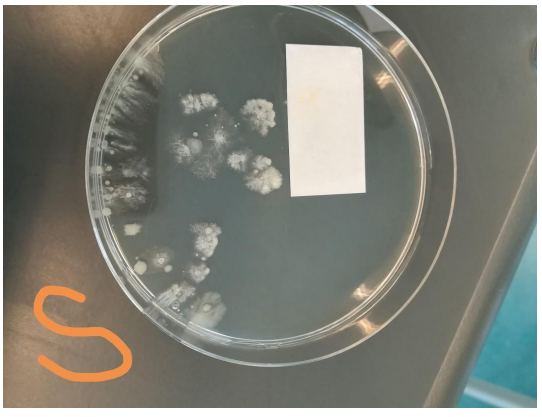
We used three petri dishes and a pipet. We collected water from three different spots of the ditch; the side, the bottom and from an area with a lot of plants. We put the three drops in the three different petri dishes and wrote down which petri dish was from which place. After a few days we analysed the results at school.

Results

Overall the bacteria and fungi look a lot like each other. The fungi grown from the dirty water (from the bottom of the ditch) is a bit different than the other two. You can see that there is a little dirt in there, and the fungi is less hairy. Also, there is more condense than in the other two. The least amount of colonies is in the Petri Dish with the clean water. The most fungi is in the petri dish with the dirty water. The fungi is yellowish and hairy. In the petridish with the water from the area where many plants grew, there are more circle like colonies compared to the fungi grown in the dish with the dirty water. On the other hand, there are many very small colonies in the dirty water.

It's difficult to tell exactly how many colonies there are. I guess there are around a thousand in each petri dish. We can say that the least amount of colonies are in the clean water, than the plants petri dish and the most colonies are in the dirty water.

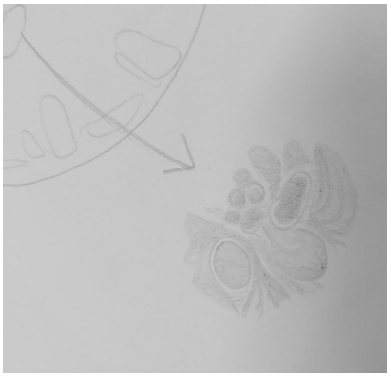




In one milliliter are approximately 20 drops. This means that there are 20 000 bacteria in one milliliter. So in 100 milliliter are 100 x 20 000 = 2 million bacteria.

Some drawn colonies.

Drawing colonie 1



Drawing colonie 2

Drawing colonie 3

Conclusion and discussion

Are there any differences in the bacterial strains and fungal species? How can you see them?

Yes there are differences noticeable in several different bacterial strains and fungi species. You can see that some of them are hairy and others aren't. Also, the shapes and sizes of the colonies are very different. Some colonies are quite big; around half a centimeter diameter. Others are very small, for example in the petri dish with the dirty water (see picture above). There are hundreds of very small (around 1 millimeter diameter) colonies along the side of the dish. In the clean water petri dish there are less small colonies and more bigger ones.

There is a clear difference between the different petri dishes from different places in the ditch. As I said, the most bacteria are in the dirty water. We think is this is because there were several particles in the water we put on the petri dish. That's where most of the fungi has grown from. The least fungi has grown from the clean water, which is quite logical because in here there were way less particles than in the dirty water. The water taken from the area where plants grew, is a bit average. It could be that this has something to do with

the amount of oxygen in the water amount of phosphate which was higher compared to the other places.

Experiment 3: Plants in and around the ditch

In this experiment we're going to collect plants, which we are later going to divide into different groups. These groups are: floating plants, 'hiding' plants, in the ground rooting watterplants, marsh plants and carr. We'll also draw the plants, so that you'll get an idea of what the plants look like. We've found 5 different types of plants, the red dead-nettle, pilewort, fool's parsley, frogbit, chickweed and Nuttall's Waterweed.

Hypothesis

During this experiment, we expect to find plants which we can divide into the 5 different groups. Because we will study the plants, we also expect to find the different functions of these plants.

Materials and methods

- Cup for water sample
- Flora
- A map to find the plants
- A small net
- A net for the water sample

Results

The red Dead-nettle is hard to classify in one of these groups. This is because it can grow on all sorts of ground. We do know that it isn't a floating or hiding plant, because it doesn't live in the water, but around it. It can grow on pretty dry grounds, but also on wet ground. Best would be if the ground is full of nutritions, because then it will go grow best. However, they can also grow in gardens or in ditches, therefore you can't classify this plant in one of the groups. This plant is a type of weed. The red dead nettle belongs to the lamiaceae family and is originally called 'Lamium purpureum.' (picture 1)

Pilewort grows on wet grounds and therefore belongs to the group 'carr'. This is because in this group all the plants grow on very wet grounds and so does the pilewort. They grow in forests and in open fields and therefore the plant doesn't belong to 'in the ground rooting water plants', because the plants in this group grow best on the side of the ditch and the pilewort doesn't. Pilewort received its name, because a very long time ago the plant used to treat piles. Pilewort belongs to the Ranunculaceae family and is also called 'Ficaria verna.' (picture 2)

Fool's parsley is seen a lot next to the road and even in gardens. Therefore, you can't classify this plant into one of the groups. It doesn't grow in the water, so it's not a floating, hiding or in the ground rooting water plant. It also doesn't belong to carr, because it doesn't need lots of water to grow. Since it's not a water plant, it also doesn't belong to 'marsh plants'. Fool's parsley is a type of weed. It's a poisonous plant and therefore sometimes also called 'poison parsley.' Fool's parsley belongs to the apiaceae family and it's 'species name' is Aethusa cynapium. (picture 3)

The frogbit belongs to the 'floating plants'. This is because, the roots are in the water, but don't reach the bottom. Therefore it's not an in the ground rooting water plant. The leaved

lay on the water surface and that's why it's a floating plant. The frogbit gets its oxygen and CO2 from the leaves which are in contact with the atmosphere. The frogbit is actually called 'hydrocharis morsus-ranae' and belongs to the Hydrocharitaceae family. The plant has small white flowers and floats on the ditch. (picture 4)

Chickweed grows best on a bit wet and nutritious ground and are very common in lawns, open places and gardens. However, they can also grow on dry places and in the sun or shadow. Therefore this plant doesn't belong to any of the groups, just like fool's parsley. Chickweed is a weed, just like the name says. Chickweed belongs to the Caryophyllaceae family and is originally called 'Stellaria media.' (picture 5)

Nuttall's Water-weed belongs to the group 'in the ground rooting water plants.' When one of the roots breaks or branch out, the roots shoot themselves into the ground. In this way the roots will always be in the ground. They're very common in most of the rivers. This plant belongs to the Hydrocharitaceae family and is originally called Elodea nuttallii. (picture 6)

Trees and bushes

While we were in the forest, we also found 4 different types of trees and 1 bush. We've found oak trees, alder tree, knotted willows, birch trees and osiers. These are all common plants and bushes, so we weren't very surprised to see those. We saw the bushes a lot next to the water, but we saw the alder trees the most. This is because we were in a forest and alder trees can also grow well in shadowed places. We also saw a lot of oak trees, but less than the alder trees. This is because oak trees need more sun to grow and in a forest there's a lot of shadow. We saw a couple of birch trees, but less than all the other trees.

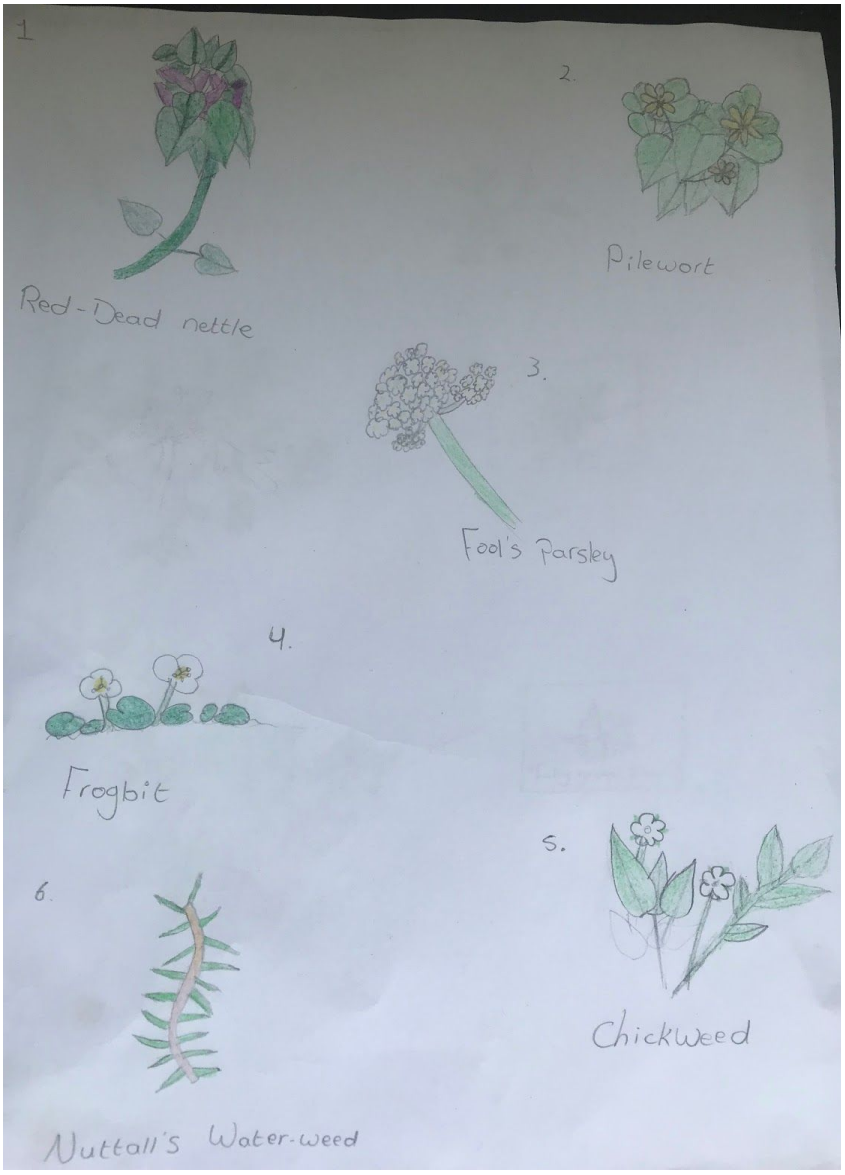
Questions afterwards

A. All of the plants that we've mentioned have a different function.
    a. The function of the frogbit is that there's a biological balance in the ditch. When the water isn't clean, this plant makes sure that it will become clean again. The plant will survive winter as well. Frogbit will also make sure that algae won't grow, because the leaves will cover the ditch against the sun. It will also decrease the amount of nitrate in the water.
    b. The red dead-nettle is an important plant as well. It's an important plant for bees, because they can get their nectar from this plant. It's also a source for pollen for bees.
    c. Every plant of the buttercup family, so also pilewort, has a connection called 'protoanemonine.' When the plant is wounded this turns into a toxic form, which can cause itching, rashes or blistering on the skin. However, when you cook or dry this plant, the plant isn't toxic anymore and can be used in diets and herbal remedies.
    d. Fool's parsley is a poisonous plant. When you've eaten this plant, you'll notice that your mouth and throat will get very hot. It can also happen that your lining membrane of the gullet and windpipe will get red. A light congestion of your stomach and duodenum can also happen. When you dry this plant, it's not poisonous, but then it won't get a medical use like the pilewort.

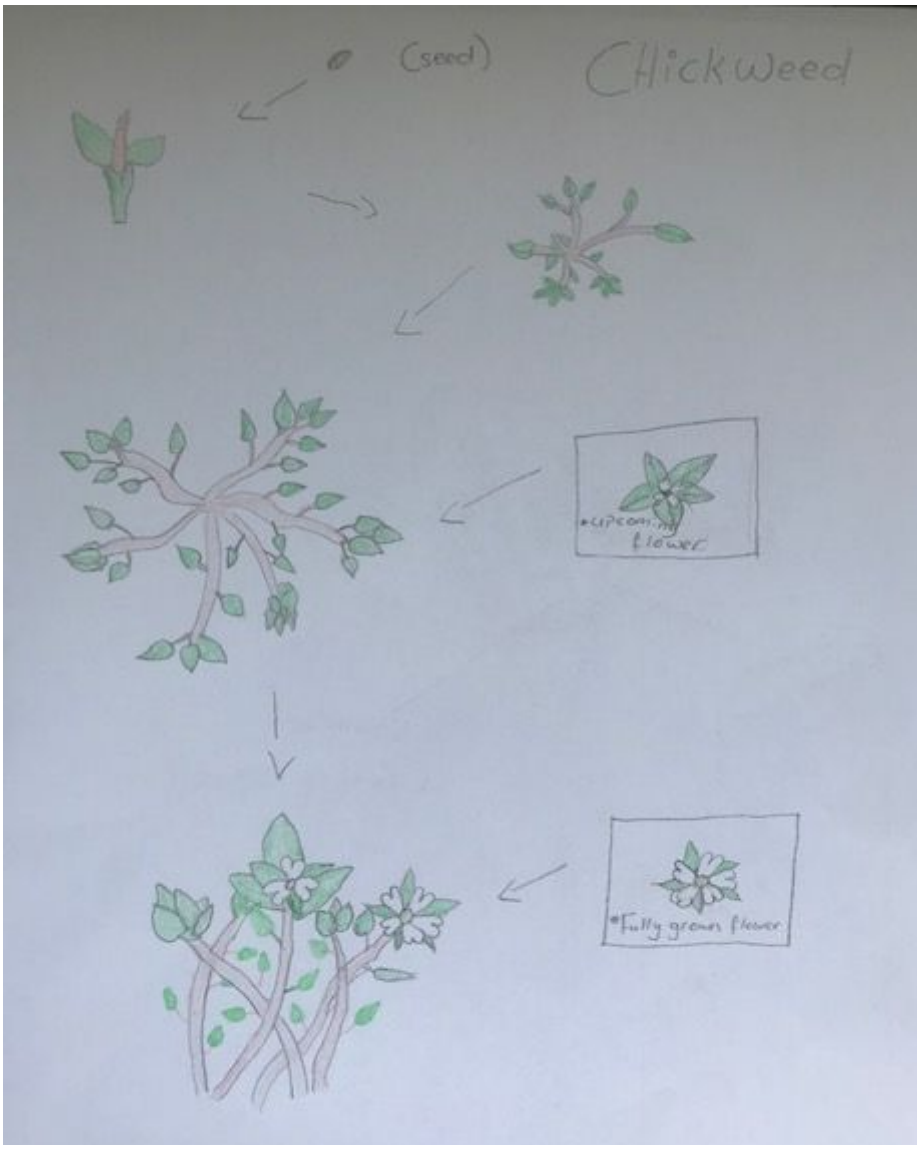
e. Chickweed is often used as food for salads. For some species chickweed can be poisonous, however, than they would have to eat lots of kilos of it, so most of the time they won't notice that it's poisonous and they won't get any effects of it. It also has a medicinal use, when you have an itchy skin, you can use this plant as a remedy.
f. Nuttall's Waterweed is used a lot in aquaria so that there will be more oxygen in the water. This plant is also used a lot in experiments, because the plant spreads that easily.

B.What do the different types of plants and biodiversity say about the ecosystem?
That lots of plants are needed to make sure that there's for example enough honey and that the water will stay clean. Every plant has a different function which is important for different species. Without some of these plants, bees or fish for example, will get a hard time surviving. In other words, abiotic factors are needed for biotic factors, but biotic factors are also needed for other biotic factors.

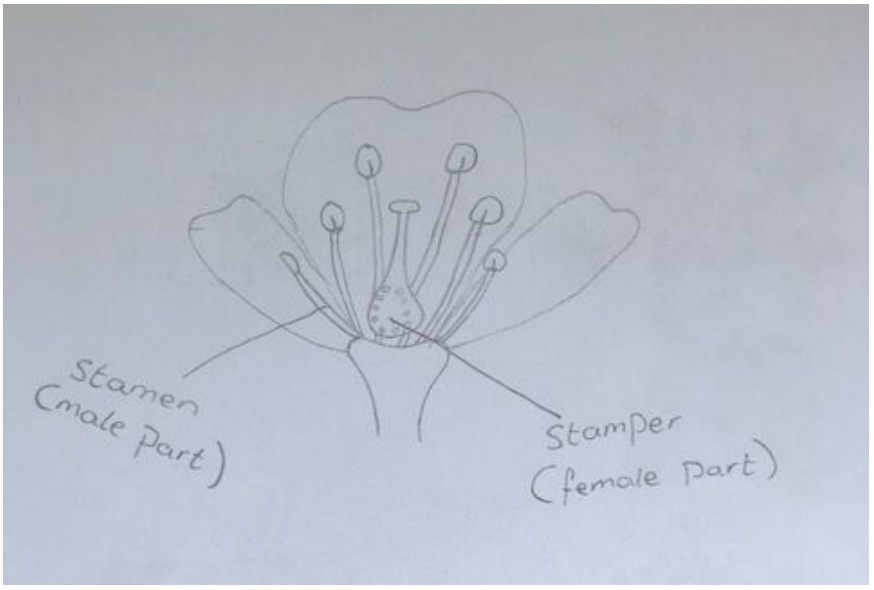
C. Which groups of plants didn't we find? What could be a reason for this?
We haven't found any plants from the group 'marsh plants' and 'hiding plants.' I think that we didn't find any hidden plants, because we mostly looked above the water surface and not a lot under it. We also didn't find any marsh plants, which could be because there were lots of other plants which were better visible than these plants. Marsh plants also live in places where it's very wet and we looked more inside the water and on dry places. I think when we would've paid more attention to the plants at the sides of the ditches and the plants inside of the water which weren't very well visible, we would've found these plants.



To give you an idea what the plants look like, we've drawn them as you can see in the picture above.



This is the way chickweed grows and as you can see, it starts with a seed, which means that chickweed reproduces by seeds.



This are the male and female parts of chickweed.

Experiment 4: Animals in the ditch.
In this experiment we are going to look at three parts of the ditch; between plants, in open water and at the side of the ditch. We are going to take samples in every part and keep them apart so that we can compare them correctly.

Materials

- Buckets
- White buckets
- Fishnets
- Search card water animals

Questions before the experiment

a. Think of three different methods to catch animals from a ditch:
   A fishing net, to lure the animals to you with food, and to hunt them down.
b. What kind of animals do you expect to catch in this ecosystem, in this season and with this way of catching?
   Slugs, fishes and bugs.

What to do

1) Take 3 samples in each place
2) Collect the samples in white buckets
3) Try to put the animals which you have found in the following table try to determine in what group they belong and count them too.

	At the side of the ditch		Between the plants		In open water	
The surface of the water	1- Water flea 2- One eye crayfish 3- Mosquito larva	3x 5x 1x	1- Water flea 2- rat tail larva 3- Mosquito larva	25 +/- x 1x 1x	1- Water flea 2- Water flea 3- Water flea	7x 4x 15x
The bottom of the water	1- Haften larva 2- Flatworm 3- Gyrinus natator	2x 1x 1x	1- Watermite 2- Water flea 3- One eye crayfish	1x 2x 3x	1- Tubifex 2- Notonectidae 3- Water flea	1x 1x 2x

animal	sketch	phylum	class	taxonomy	how many per sampled place
water flea	1	Arthropoda Crustacea	Branchiopoda	Kingdom: Animalia Phylum: Arthropoda Class: Crustacea Order: Cladocera Family: Daphniidae Genus: Daphnia	3 from the surface of the side of the ditch, 25 at the surface where plants are and 3 at the bottom, 26 in total at the surface in open water and 2 at the bottom
Copepod	3	Arthropoda	Hexanauplia	Kingdom: Animalia	3 at the bottom of the water

		Crustacea		Phylum: Arthropoda Subphylum: Crustacea Superclass: Multicrustacea Class: Hexanauplia Subclass: Copepoda	between plants
Mosquito larva	4	Arthropoda	Insecta	Kingdom: Animalia Phylum: Arthropoda Class: Insecta Order: Diptera Suborder: Nematocera Infraorder: Culicomorpha Superfamily: Culicoidea Family: Culicidae	Once from the surface at the side of the ditch, also once at the surface of the water between the plants.
Mayfly	5	Arthropoda	Insecta	Kingdom: Animalia Class: Insecta Subclass: pterygota Superorder: Ephemeropteroidea Order: Ephemeroptera	Only one at the bottom of the water at the side of the ditch
Gyrinus natator	6	Arthropoda Coleoptera	Insecta	Kingdom: Animalia Phylum: Arthropoda Class: Insecta Order: Coleoptera Family: Gyrinidae Subfamily: Gyrininae Tribe: Gyrinini Genus: Gyrinus Species: G. natator	Only one at the bottom of the water at the side of the ditch
Eristalis tenax	8	Arthropoda Hexapoda	Insecta	Kingdom: Animalia Phylum: Arthropoda Class: Insecta Order: Diptera Family: Syrphidae Genus: Eristalis Subgenus: Eoseristalis Species: E. tenax	Only one at the surface of the water between the plants
Girardia tigrina	7	Worms	Turbellaria	Kingdom: Animalia Phylum: Platyhelminthes	Only one at the bottom of the water at the side of the ditch

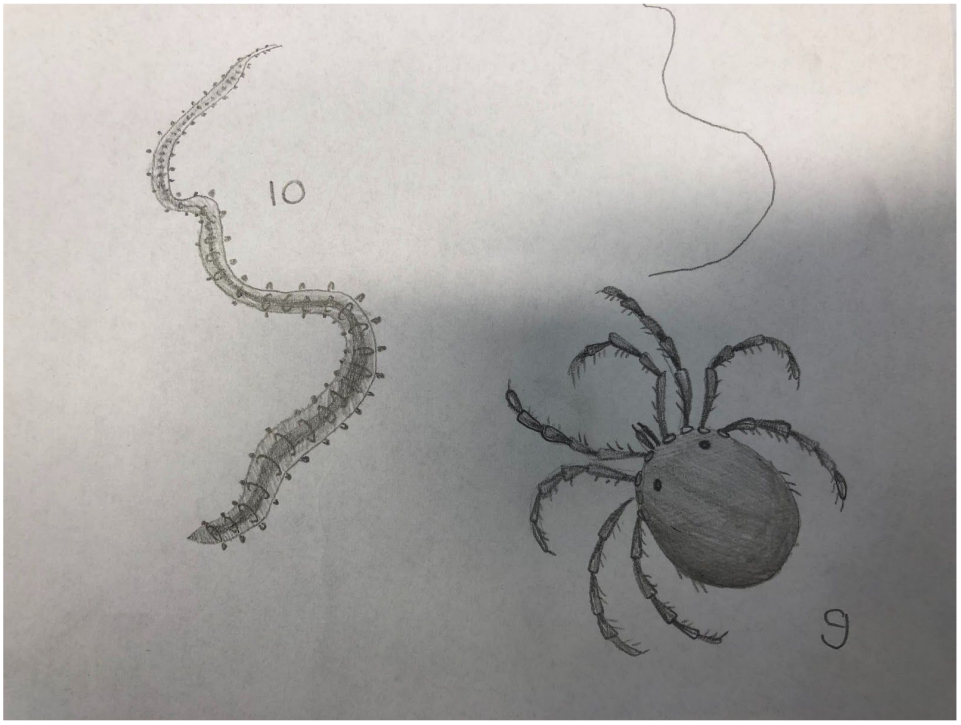
				Class: Rhabditophora Order: Tricladida Suborder: Continenticola Family: Dugesiidae Genus: Girardia Species: G.tigrina	
Watermite	9	Arachnids	Arachnida	Kingdom: Animalia Phylum: Arthropoda Subphylum: Chelicerata Class: Arachnida Order: Trobidiformes Superfamily: Hydrachnoidea Family: Hydrachnidae	Only one at the surface of the water between the plants
Tubifex	10	Annelida	Clitallata	Kingdom: Animalia Phylum: Annelida Class: Clitellata Order: Oligochaeta Family: Naididae Subfamily: Tubificinae Genus: Tubifex	Only one at the bottom of the water in open water
Notonectidae	2	Arthropoda	Insecta	Kingdom: Animalia Phylum: Arthropoda Class: Insecta Order: Hemiptera Suborder: Heteroptera Infraorder: Nepomorpha Family: Notonectidae	Only one at the bottom of the water in open water

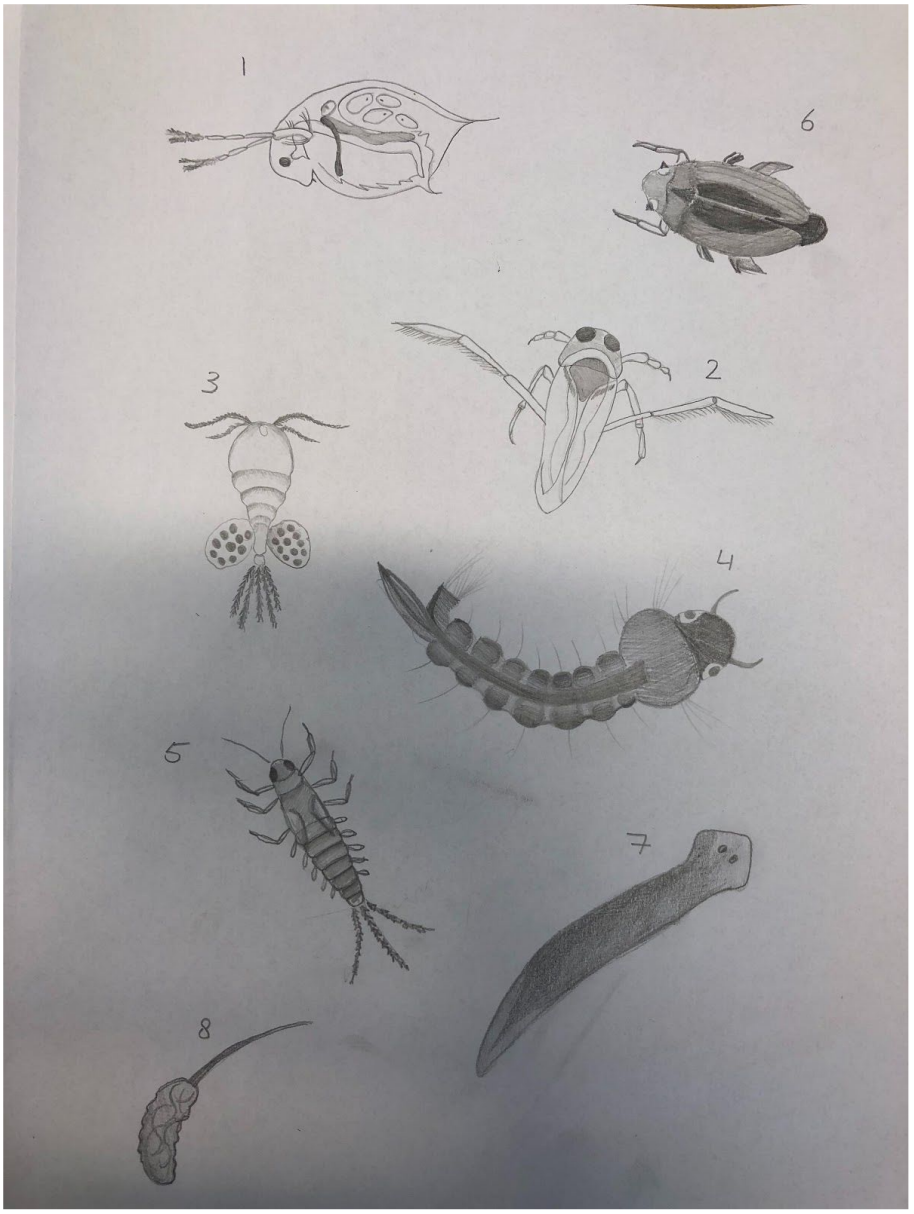
Questions after going to the Nespolder

a. At what place could you find the most animals? Can you think of a reason for that?
   We found around 25 water fleas in one place which was between the plants and at the surface of the water. We think this is because the plants give out oxygen. And that maybe for that reason the water fleas like it there. Some plants are also very rich of food for animals but we don't know what plant was in the ditch we took the samples from.
b. At what place could you find the most different kind of animals? Can you think a reason for that?

Wel with every single sample we only choose one animal or only had one animal. So we can’t really say in what place we found the most different kind of animals.

c. Determine what the quality is of the water
   The types of insects and other invertebrates living in the world's lakes, rivers or oceans can tell us if that water source has very high or very little water pollutants. By looking at the kinds of animals which we have found we can determine if the water is heavily polluted or if it is not. We can determine this by looking whether the animal is sensitive to pollution, somewhat tolerant or completely tolerant. We have found this information about two animals. Watermites and mayflies are animals that are sensitive to pollution. This means that they do not live in polluted water a lot. We have found these two animals at the Nespolder and therefore we can conclude that the water is not so polluted and so the quality is good.





Final conclusion

What is the influence that abiotic factors have on the existence of animals and plants?

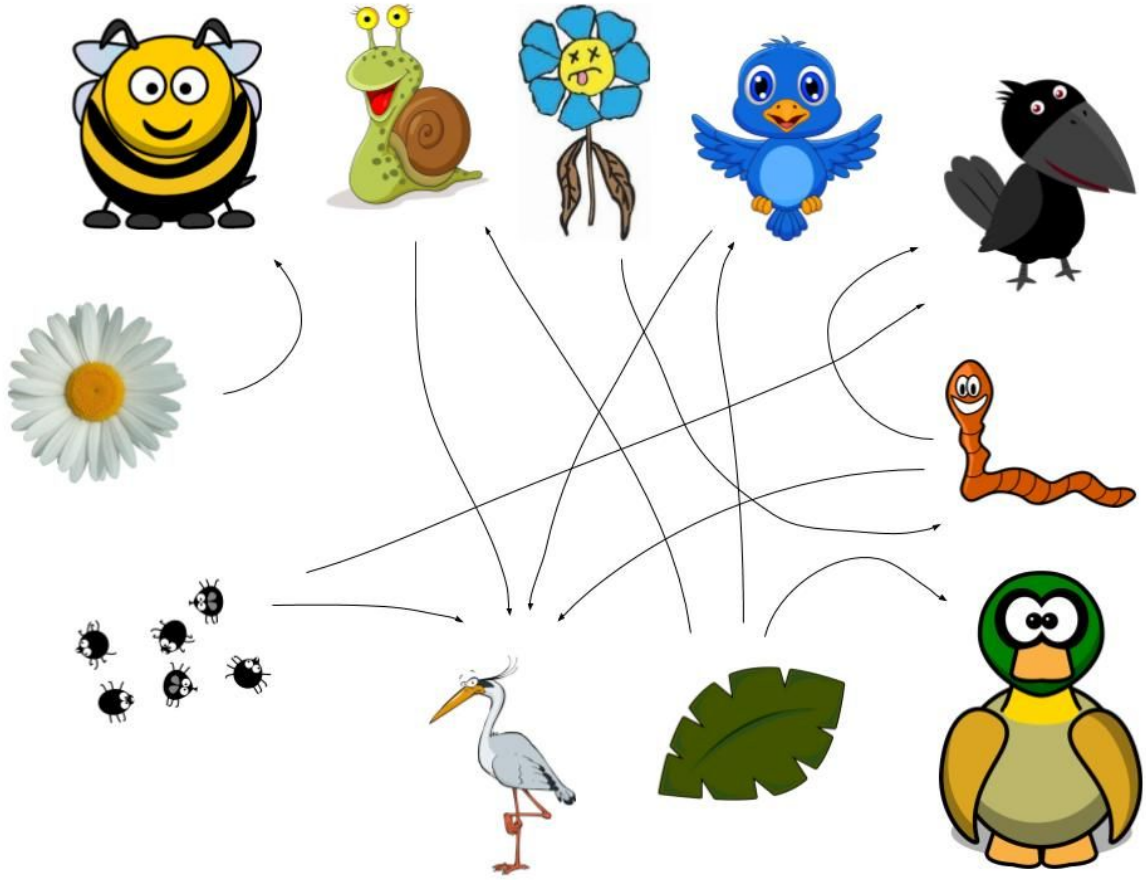
The influence of abiotic factors on biotic factors is a lot. For example, certain types of plants need a lot of water, because otherwise they can't grow. Plants and animals also need sunlight. Plants need this to grow, but animals need it to know when it's day and when it's night. For example, when humans don't know this, they won't get energy and their rhythm will get disturbed. Rain is also an important abiotic factor for plants, because when they won't get water, they'll die. You can see this is desert, because only plants who can survive in such dry climates can grow there. Temperature is also an important factor, because when it's -273 degrees outside, we wouldn't be alive anymore just like all the other living things.
Biotic factors depend on abiotic factors to make sure that they can exist and also survive.

What is the quality of the water ecosystem in the Nespolder?

Based on what we have measured we think that the quality of the water in the Nespolder is quite good because of the animals which we have found the watermite and the mayfly which are sensitive to polluted water. And therefore the water quality is good otherwise we wouldn't have found these animals. Also the light / clarity is good because you could go deeper than half the depth and still determine the black and white on the circle.

Describe the community of life in the Nespolder detailed, so with many different organisms and their relations. Use results, the food web from the extra exercise, but also the knowledge from the book.

The time we visited the nespolder was in april which is in the middle of spring. In this time pairing is done and more organisms can be found. Although we haven't found a lot of special organisms which we don't see everyday when cycling to school or in our garden we have found snails and bee's, several kinds of birds insects and plants. We were able to make this food web. We can see that there is one top predator which is the heron, he eats almost everything which is smaller than him. This food web gives only a small picture about the organisms living in the Nespolder. There were of course different flowers like buttercups or other kinds of insects but we think the community in the Nespolder is good because we have found a lot of organisms. It was a beautiful day and we think because of that we found more organisms. The Nespolder is just an average ecosystem we see in everyday life and we think that because we knew all the animals and plants we found.



Is there a correlation between the algae and the amount of animals in the ditch?

Our own research in the Nespolder

Algae, so small but can have big influences. What about the animals? We asked our self to what extend there will be a correlation between de the algae and the amount of animals in the ditch. The specific ditch we did our research on is located in the ‘Nespolder’ in Bergambacht. On the pictures we beneath and throughout the essay you can find the particular working space we proceeded us.

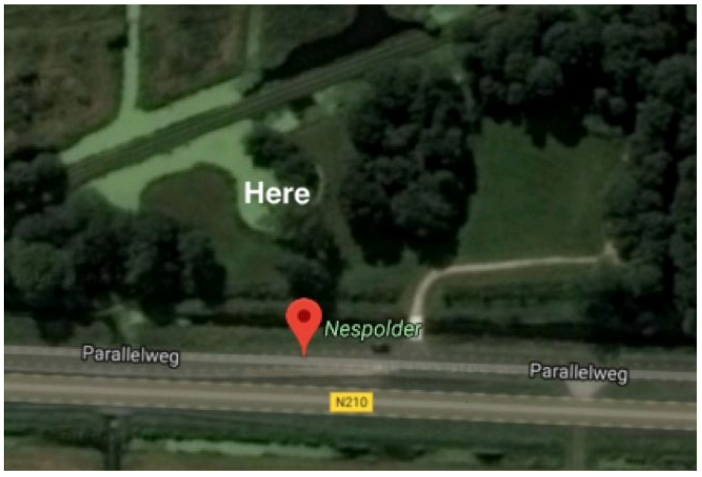
Hypothesis

We expect to find a negative correlation between the algae and the amount of animals in the ditch. We think that there are less animals at places where there are a lot of algae. This is because too much algae keep the sunlight away from the animals. It could be that this is caused by eutrofiering. Eutrofiering means that the chemicals in fertilisers like phosphate and nitrate, spread by farmers to fertilise their ground, are being washed away by the rain and end up in the ditch. Eutrofiering causes algae to grow fast, which has a negative impact on the life in the ditch. On the other hand algae are the producers of the food chain. Animals like tadpoles, water flo's and haften larvae eat algae, water flo’s got eaten by fish and so on. So with a normal amount of algae the food chain will keep stable. And there might be a positive correlation between the algae and the amount of ditch animals.

Material and methods

We have used the following materials:

- Buckets
- White buckets
- Water
- Fish nets
- Indicators for phosphate
- Indicators for nitrate
- A waste bottle
- Earlier derived results



We observed a lot. To determine how many animals there were present in the ditch we used the average of the animals caught in experiment 4. Also we kept in mind the quality of the water calculated in the first experiment. To determine how many algae there were present in the ditch we looked how much of the water surface was covered with it. And measured the value of the phosphate and nitrate. Because this are nutrients so needed for growing algae. So if like half of the ditch was covered with algae or that the ditch was completely green from the algae. We have used our results, grey brain and the online library to combine the information into a well funded conclusion.

On the picture on the above you can see the place where we have carried out the research. There is no direct contact with a ditch where presumably fertilisation has taken place.

Results

We have seen that there are many different animals present in the researched ditch. The ditch didn't seem totally green or covered with duckweed as you can see on the picture on the beneath, but we identified some algae. In the table below you can see the outcome of the nitrate and phosphate measured at different places in the ditch. This influences the growing of the algae, the more nutrients there are for the algae and the better the circumstances will be the population of algae increases rapidly.

	The side	The bottom	Near plants
NO3	5 ppm	5 ppm	5 ppm
PO4 3-	2 ppm	1 ppm	1 ppm

The average amount of animals caught per fishing is 13 animals this is quite a lot. We calculate this by using these numbers:
(9 + 27 + 26 + 4 + 6 + 4) :6 ≈ 13

	At the side of the ditch		Between the plants		In open water	
The surface of the water	1- Water flea 2- One eye crayfish 3- Mosquito larva **TOTAL CAUGHT =**	3x 5x 1x **9**	1- Water flea 2- rat tail larva 3- Mosquito larva **TOTAL CAUGHT =**	25 +/- x 1x 1x **27**	1- Water flea 2- Water flea 3- Water flea **TOTAL CAUGHT =**	7x 4x 15x **26**
The bottom of the water	1- Haften larva 2- Flatworm 3- Gyrinus natator **TOTAL CAUGHT =**	2x 1x 1x **4**	1- Watermite 2- Water flea 3- One eye crayfish **TOTAL CAUGHT =**	1x 2x 3x **6**	1- Tubifex 2- Notonectidae 3- Water flea **TOTAL CAUGHT =**	1x 1x 2x **4**

Conclusion and discussion

A reason that the ditch wasn't completely covered with algae, could be because there isn't a farm close to the ditch where the manure can go into the ditch. However, there were algae which means that there is human activity nearby, because they do have the amount of nutritions they need to grow. On the picture you see mostly duckweed, but to draw an image of the surroundings of the measured place and algae activity it gives a right idea. There is a symbiotic relationship between the algae and animals. Algae, just ast other plants convert CO2 and water with the help of photosynthesis into carbohydrates and oxygen. The light is 'caught' by pigments, which chlorophyll is the most common. These inorganic elements are being converted in organic material like proteins or fats. Algae are a an important factor to the basis of the food chain between the living and non-living world.

Algae produce oxygen, which animals in the ditch need to survive. Because of this, when there are a lot of algae, there will be more oxygen available for the animals in the ditch. Which is a must for animals to live. Algae turn CO2 into organic elements, which the animals need. The animals in the ditch are completely dependent on the plants because of this. However, there are also animals which eat the algae, so when there are more algae, more animals will come, but they will also eat the algae.

The availability of nutrients, like nitrate and phosphate, determine where algae can grow. Algae grow extremely well under warm conditions and reproduces themselves rapidly. In places with much human activity, like agricultural and industrial places, many nutrients end up in the water. Thus eutrophication is the reason why algae grow well. Because algae cause a suffocation animals die because of a lack of oxygen. This has a positive consequence for the growing of algae. Less animals means less predators for the algae, which encourages the growing.

Further researched could be done to distinguish a difference between the ditch we have carried out our research and ditch were fertilisation takes place for sure, to examine whether there are more algae or animals are present.

In the ditch there are not a lot of algae present. A reason for this could be, because there isn't a meadow close to the ditch, because when there would be, the manure of the animals would go into the ditch and therefore the ditch would contain more nutritions. When there would have been more nutritions, there also would've been more algae.

Our final conclusion therefore is that there isn't really a correlation in the ditch. The animals in the ditch need the algae, because they make sure there's enough oxygen for the animals. When there would be more algae, more animals would be able to survive. This would mean that more animals would be present in the ditch. However, when there would be more

animals, also more animals would be there who eat the algae. Because of this, the amount of algae would reduce again and then of the animals as well.
The fact that there were a lot of animals in the ditch means that there are less algae who disturb the growth and life of the animals. Some animals also eat the algae, which is also a reason that there are more animals present in the ditch than algae. The correlation in the ditch therefore would be: The more animals in the ditch, the less algae. So there is a negative correlation in the ditch of the ‘Nespolder’.

Logbook	When?	What?	How long?
Mette	Thursday 5 April	Filled in data experiment 1	30 min
Maureen	Maandag 9 April	Start writing report	50 min
Mette	Monday 9 April	Rewrite experiment 1 in English	50 min
Jeliena	Monday 9 April	Start experiment 3	50 min
Emily	Tuesday 10 April	Start experiment 4 and made table of what animals we found	60 min
Maureen	Tuesday 10 April	Analyse fungi experiment 2	50 min
Jeliena	Tuesday 10 April	Continue experiment 3	50 min
Emily	Monday 16 April	Made the table about the further information about the animals	90 min
Jeliena	Monday 23 April	Continue experiment 3	30 min
Maureen	Wednesday 25 April	Work on project	15 min
Emily	Wednesday 25 April	Looked up the English names for animals	15 min
Jeliena	Wednesday 25 April	Work on project	15 min
Emily	Thursday 26 April	Made drawings experiment 4	60 min
Mette	Monday 30 April	Frontpage and content	15 min
Jeliena	Saturday 5 May	Work on project	90 min
Jeliena	Sunday 6 May	Complete experiment 3	80 min
Jeliena	Thursday 10 May	Make drawings	65 min
Emily	Friday 11 May	Answered questions afterward Nespolder	30 min
Mette	Saturday 12 May	Fill in table and finish up	60 min
Maureen	Saturday 12 May	Worked on experiment 2	50 min
Emily	Sunday 13 May	Finished up experiment 4	45 min
Jeliena	Sunday 13 May	Finished up	15 min
Maureen	Monday 14 May	Finished assignment	100 min
Mette	Sunday 20 May	Start + finish own experiment	200 min

Emily	Sunday 20 May	Made a foodweb and the text with it	30 min
Jeliena	Sunday 20 May	Work on own experiment	120 min
Maureen	Monday 21 May	Finished up	20 min

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