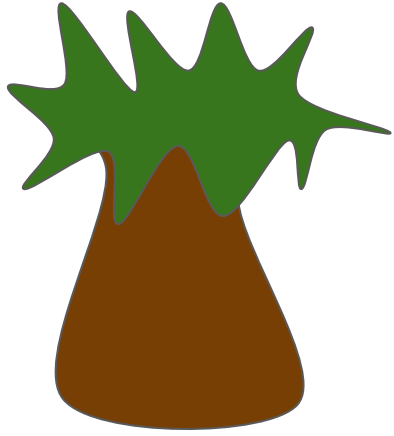
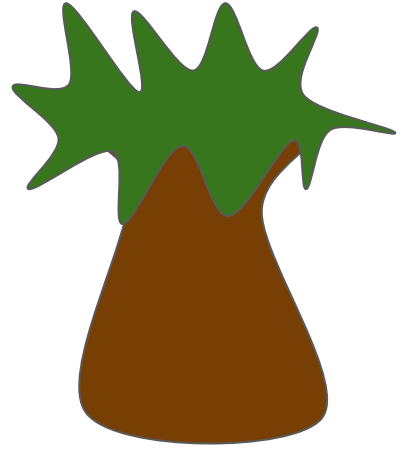




Aquaponics



By: Emily, Avigal, Arlo, Nick, and Rachel

What is aquaponics?

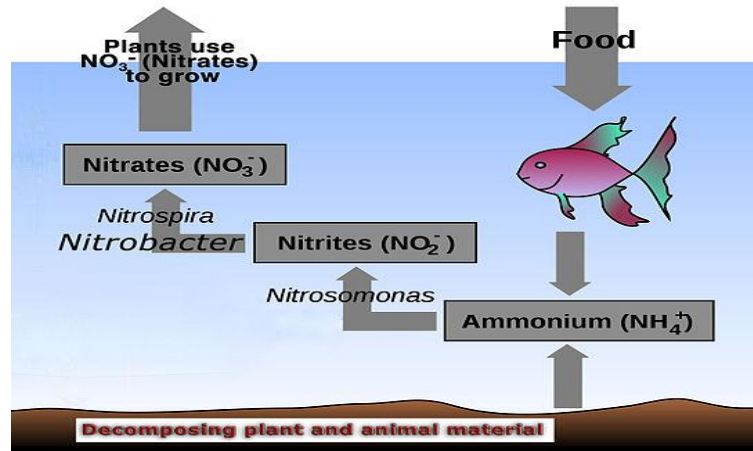
Aquaponics is raising fish and hydroponics (the soil-less growing of plants) that grows fish and plants together in one combined system.



These are the lettuce plants we grew using aquaponics.

How does aquaponics work?

The fish waste provides an organic food source for the growing plants and the plants provide a natural filter for the water the fish live in. Each living thing depends on each other. They do the job of converting the ammonia from the fish waste first into nitrites, then into nitrates and the solids into vermicompost that are food for the plants.



This is an example of how the system works.

Where is aquaponics used?

Aquaponics is used in greenhouses, farms, and plantations around the world to help benefit fish, and your crops.



These are radish plants that people grew using the system.

Why is aquaponics used?

Aquaponics is used to make a balanced environment between fish, and the crops being grown. It is a beneficial system because it helps both the fish and the plants. The fish provide nutrients for the plants, and the plants provide filtered and clean water for the fish. Using this system, plants will be produced in a sustainable and natural way.

This is where the fish live.(Right below the plants).

Arlo



Who would use aquaponics?

Farmers and people who work in greenhouses would use aquaponics. Also people trying not to use chemicals and be more natural when growing plants. This is a picture of a boy in middle school taking out a probe to use to measure the PH.



This is an example of someone using the system.

What does aquaponics look like in the WMS greenhouse?

Aquaponics looks very interesting and different. There is a tank with fish and above it are plants that get nutrients from the fish waste.



These two pictures are what the WMS greenhouse looks like.

Emily

What Measurements Were Taken?

Date	Lettuce	PH	Amonia	Nitrite	Nitrate
10/1/16	4 cm	7.6	.25	0	.4
10/17/16	17 cm	7.6	.25	0	.4
10/24/16	25 cm	7.6	.35	0	.3
11/1/16	33 cm	7.4	.25	0	.3
11/22/16	40 cm	7.6	.32	0	.3

Measurements

The measurements that we took in the greenhouse were always very good. A measurement for the nitrite is supposed to usually be around 0. Our measurements were always around that. The nitrate is supposed to be around .3. To add on, the ammonia is supposed to be around .25. Additionally, the PH is supposed to usually be around 7.6. In conclusion, the lettuce had good measurements because each time we came to the greenhouse it grew at least seven inches. Our measurements were exceptionally good because they were always around those numbers listed.

Summary

In Aquaponics we did many things. Some of those things include measuring plants, checking for whitefly, testing the fish water, feeding the fish, and watering plants. The plants we measured were lettuce and tomato plants. Also we checked for whitefly on those plants. When we tested the water we tested for ammonia, and nitrate. We also checked the temperature of the water. These tasks were done so that the aquaponics system would keep going. Also to make sure it was still healthy.

In this picture we checked for whitefly



Emily and Nick

What did Emily do in the greenhouse?

I did many different things in the greenhouse. One thing I did was check for bugs on the lettuce and measured the lettuce. I worked with the lettuce to make sure every week that they are still okay to be harvested and they don't have bugs all over them. I measured it to make sure it was still growing healthy.



This is one of our lettuce plants.

Emily

What did Arlo do in the greenhouse?

In the greenhouse, I helped out with many things. However, I mostly checked the Ph of the water and fed the fish. When I checked the Ph I did it in two different ways. The first way I checked was with a probe. I would dip the probe in the water, stir it around and on the small screen it would say the ph level. The second way I would check the ph is by getting a water sample, adding a chemical, and in two minutes the color of the water would determine the PH level. These tasks were completed to see if the system was still healthy. I measured the PH to make sure the water still had the right amount of it. I also fed the fish to make sure they were alive and healthy.

Emily and Arlo



This picture shows arlo getting water samples from the fish water.

What did Avigal do in the greenhouse?

I checked the tomato plant for bugs and I measured it. I also watered the plants with a hose. I did this to make sure this plant was still healthy and growing well. I checked for bugs to make sure it was okay to be harvested. I watered the plants with a hose to keep it healthy and make sure it doesn't die.



This is a tomato plant being checked for whiteflies.

What did Nick do in the Greenhouse?

I watered the plants, harvested lettuce, and measure the ammonia and nitrate. I did these jobs to make sure the cycle was still going. I harvested the lettuce so more could be grown. I watered the plants to keep them alive and I measured the ammonia and nitrate to make sure that the water still had the amount of chemicals it is supposed to have.

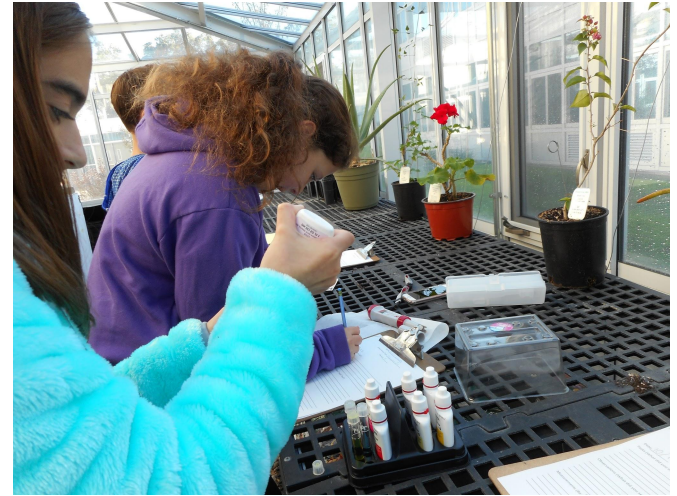


This is the tubes of water after we added the chemicals.

What did Rachel do in the greenhouse?

I checked for Nitrite and the temperature of the water. I checked if the lettuce plants were healthy. I also harvested the lettuce plants. I did these jobs because we needed to make sure the water still had the chemicals it needed and the chemicals that are not good, it did not have.

I'm checking the fish tank water for the nitrite.



Emily and Rachel