Title: Lab Report-Ecocolumns
Heading:
Name: Manuela Mensah, Gabby Cordoba, Ariana Fielding-Clarke, Catherine Dabbs
Date: 03/27/17
Class: 9th Period Environmental Class

Background Information:
-We were assigned a task to create an ecocolumn with bottles. Before we started anything we had to look up information about eco columns. We first had to find out what a controlled experiment was, experiment that has one or few factors changing while the rest are constant. We went over what an ecosystem was and the differences between an aquatic and terrestrial ecosystem. After learning more information we started thinking of some ideas, and drawing some structures for the ecocolumns. On another day we had to build up our knowledge by learning more about producers, consumers, and decomposers. Producers trap energy and can make new organic material from inorganic material, all other organisms rely on producers as a source of food, either directly or indirectly, consumers process of respiration in which they break down organic matter to obtain energy while they release inorganic matter, and decomposers can convert organic matter to inorganic material. We learned how to describe a food chain and food webs. After all of that we started looking deeper into the carbon cycle, nitrogen cycle, and the phosphorus cycle. We had to all show how it would all connect to our ecocolumn. For the carbon cycle, we had to describe how some things are involved in the cycle like, carbon dioxide, producers, organic compounds, consumer, respiration, decomposers, and we had to describe how humans are changing the cycle. We did something similar for the nitrogen cycle and phosphorous cycle. But we only had to describe how stuff were involved with that cycle. On the 5th day we sketched out the 3 cycles on posters, nitrogen, carbon and phosphorus. In the posters we had to show our connections between all the cycles. We also had to include how the diagrams connect with out ecocolumn. On day 6 and 7 we finished working up on our designs, started gathering things that we would need for the ecocolumn, and started writing our step by step directions. For day 8 and 9 we started working on our ecocolumn and putting our things together, we also made a data table to keep track of what happened each day. Our data table

concluded, plant size, the height of the plant, water added to plant and soil, water added inside of our fish tank, nitrite levels, nitrite levels and ammonia levels.

Driving Question:
-What will a plant need to survive in a terrestrial environment?

Hypothesis:
- If the amount of water in the soil is too high we will drown(harming) the plant, because too much water can be bad for the plants.

Materials:
-1 fish
-2 bottles
-at least 2 handfuls of pebbles
-small plant to put in fish tank so the fish can get oxygen
-seeds (from Ms.D'Imperio)
-dirt (2-3 cups)
-at least 5 worms
-string (5-8 inches)
-straw
-soda cap

Procedure:
1. Cut bottle #1 (13 and ½in.)
2. Cut bottle #2 (16.8 in.)
3. Cut bottle #2a (5.25in.)
4. Put 450 ml of distilled water in bottle #1
5. Put 1 ml of bacteria in bottle #1 distilled water
6. 3cm of soil in bottle #2
7. Place worms (varied amount) in bottle #2
8. 3cm of soil in bottle #2
9. Pour 20 ml of pond water in bottle #2
10. Put 100 ml of soil in bottle #2a
11. Place fertilizer in soil

12. Put 3cm more soil in bottle #2a
13. Then place 6-7 plant seeds in bottle #2a
14. Put 6cm more soil in bottle #2a
15. Add 2 and a half inches of dirt
16. Added moss from pond water into the bottle 1
17. Put in around 200ml of water in the tanks
18. Put 4m of water in bottle #2 and bottle #2a
19. Added 4 more pieces of fertilizer
20. Added more seeds to bottle #2a
21. We added cheesecloth and a coffee filter to collect the dirt inside the bottle of #2

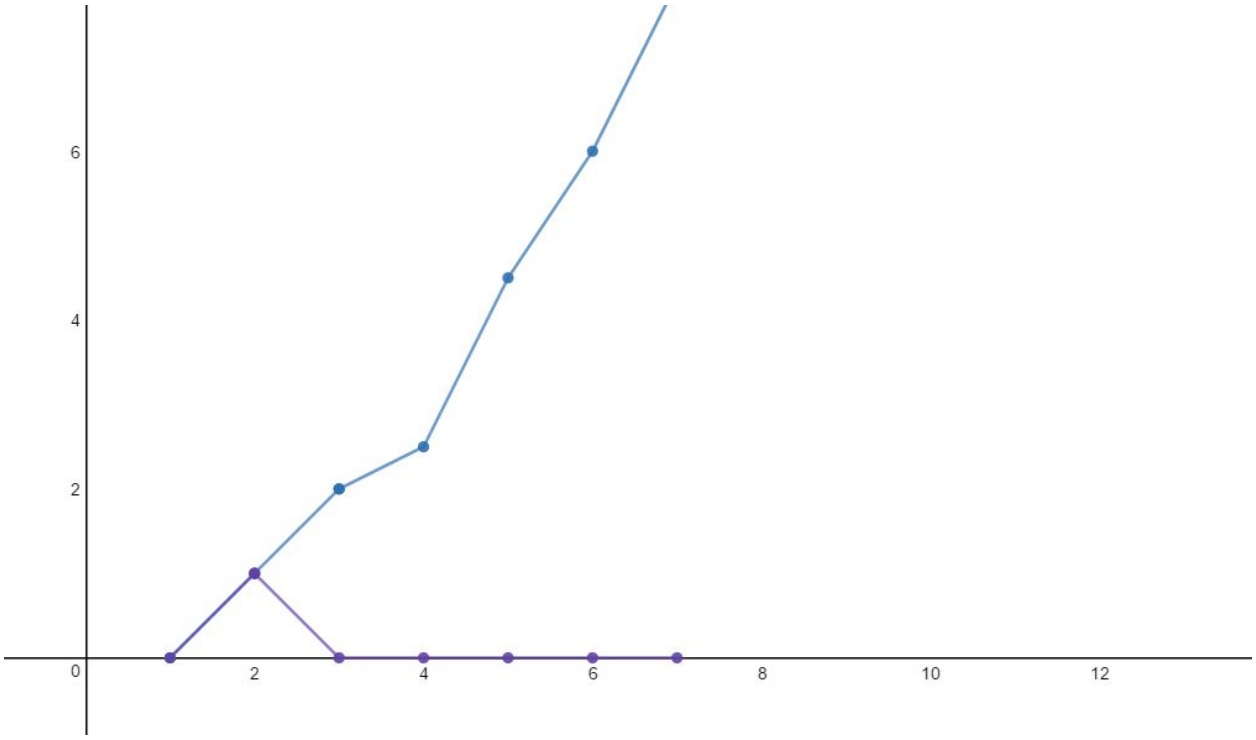
Results/Data:

	Day 1	Day2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Plant Size	0cm	0cm	0cm	0cm	0cm	0cm	0cm	0cm		
Height	0cm	1cm	2cm	2.5cm	4.5cm 4cm 2.5cm	5.5cm 6cm 3cm	8cm			
Water Added To plant	4ml	15ml	0ml	25mL	25mL	50mL	25mL	25mL		
Water Added To soil	4ml	0mL		0mL	25mL	50mL	25mL			
Water Added	0ml	0ml	0m/L	0mL	0mL	0mL	0mL			

To Fish tank										
Nitrite Levels	0 mg/L	0mg/L	0mg/L	0mg/L	0mg/L	0mg/L	0mg/L			
Nitrate Levels	0 mg/L	0mg/L	0mg/L	0mg/L	0mg/L	0mg/L	0mg/L			
Ammonia Level	0 mg/L	0mg/L	0mg/L	0mg/L	0.5mg/L	0mg/L	0m/L			

	Day 11	Day 12	Day 13	Day 14	Day 15	Day1 6	Day 17	Day 18	Day 19	Day 20
Plant Size										
Height										
Water Added To plant										
Water Added To soil										
Water Added To Fish tank										
Nitrite Levels										

Nitrate Levels										
Ammonia Level										



Graph:

-This graph represents the plant size which is the purple line and the height of the plant which is the blue line, throughout all the days.

Analysis:

-The day after we put the fish in the ammonia levels went up a little bit to 0.5.. The fish increased the level of ammonia in the water and the decreased back down. The plant height did end up going higher. The plant size didn't really change at all it just stayed at 0cm. The amount of water we added to the plant ended up changing because instead of adding only 4 mL of water we started adding 25 mL with the dropper.

Conclusion:

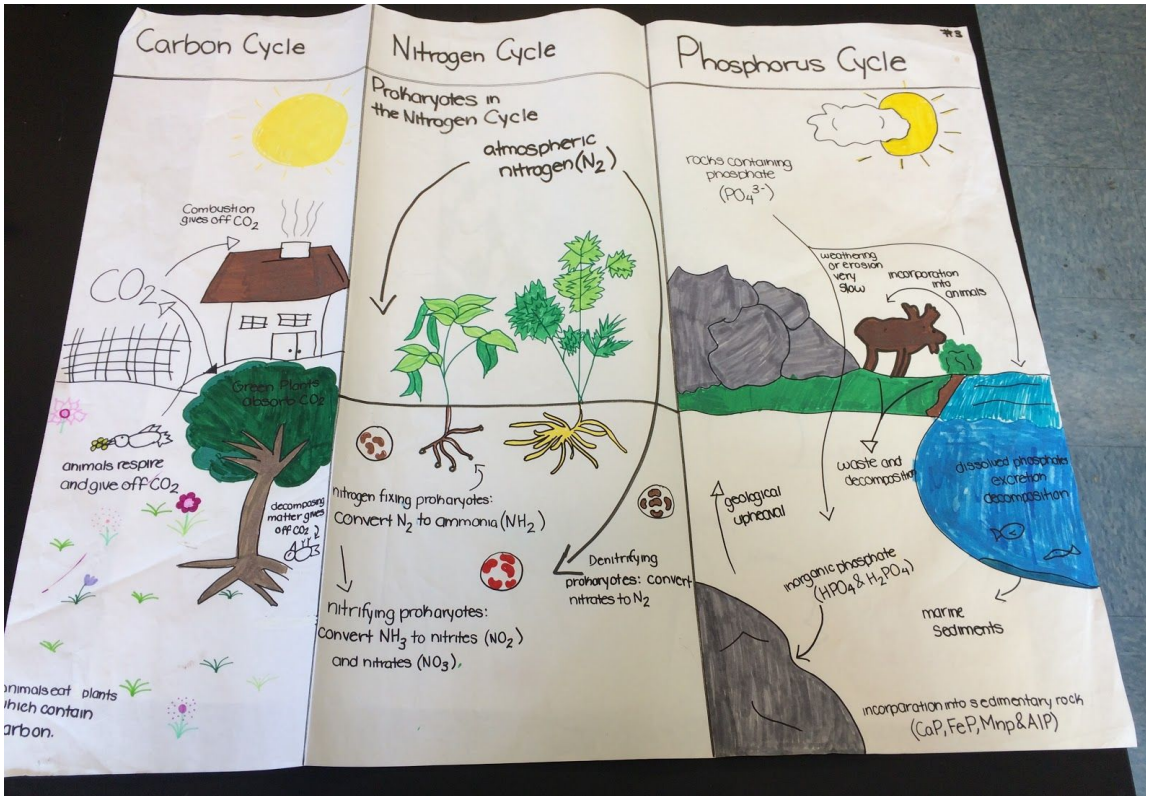
-What a plant needs to survive the terrestrial environment is a lot of water and sunlight. A whole bunch of sunlight because Manuela brought the ecocolumn home and the plants ended up dying on friday and saturday. We were left with a couple of plants that are still living. But in conclusion the plants need a lot of sunlight and plenty of water to survive in a terrestrial environment. Working well in a group was good for the lab. One problem was that we kept changing how the things we're going to look for ecocolumns. We added a filter because we thought it would be a good idea to help pick up the dirt from the fish tank. Another thing we changed was where the phosphorous cycle was supposed to happen. We had got really big worms from our classmate and placed them inside of our bottle only to find out that they had died a couple days after. The first time we cut the bottles we actually messed up on how we cut it so we had to get another bottle and fix how we cut it. We should have at least cleaning out the tank because it smelled really terrible, if we cleaned it out our fish could have still lived possibly. Our data does support our hypothesis because we added in the right amount of water that we needed for our plants to live. We didn't add in too much water to drown our plants. The only problem was helping the plants getting the right amount of sunlight.

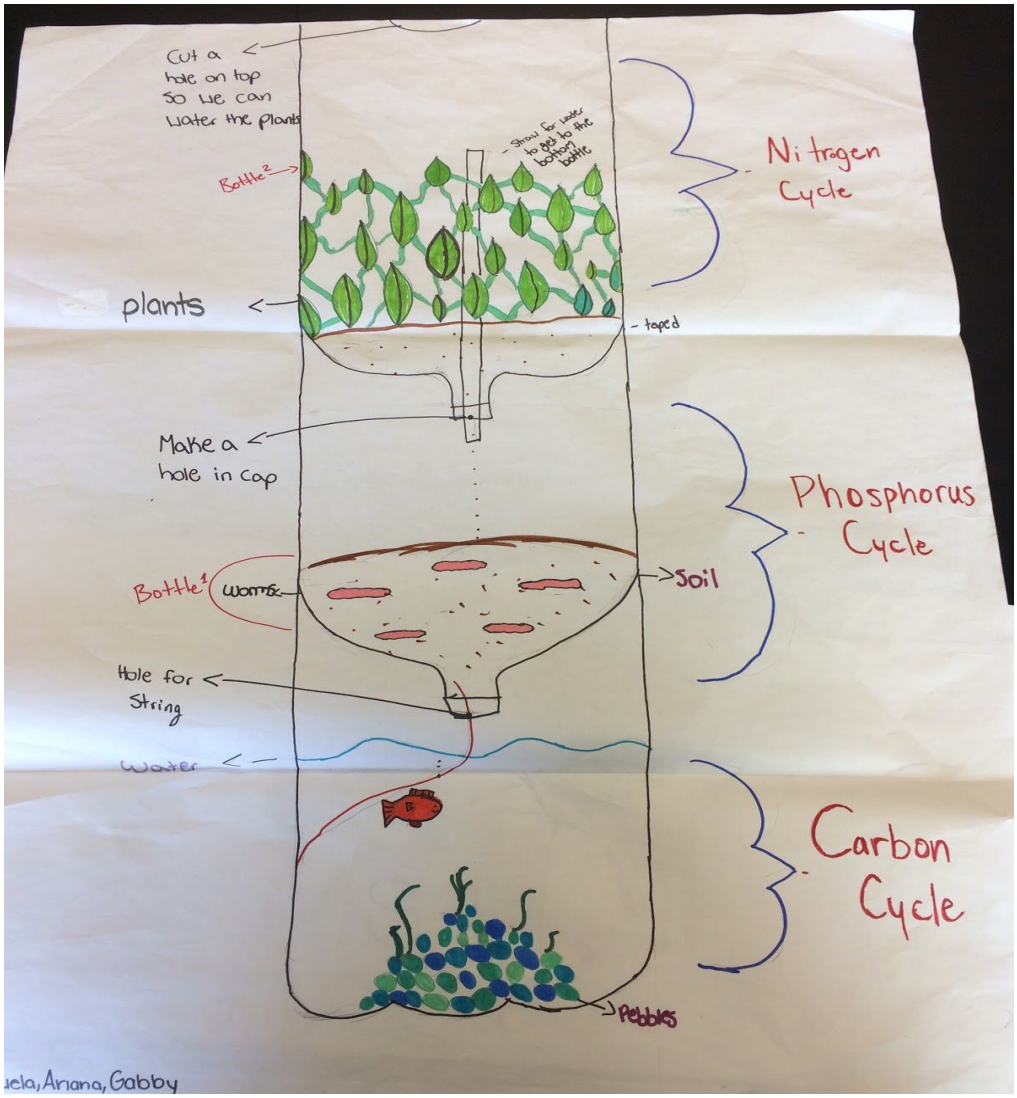
"I learned..."-

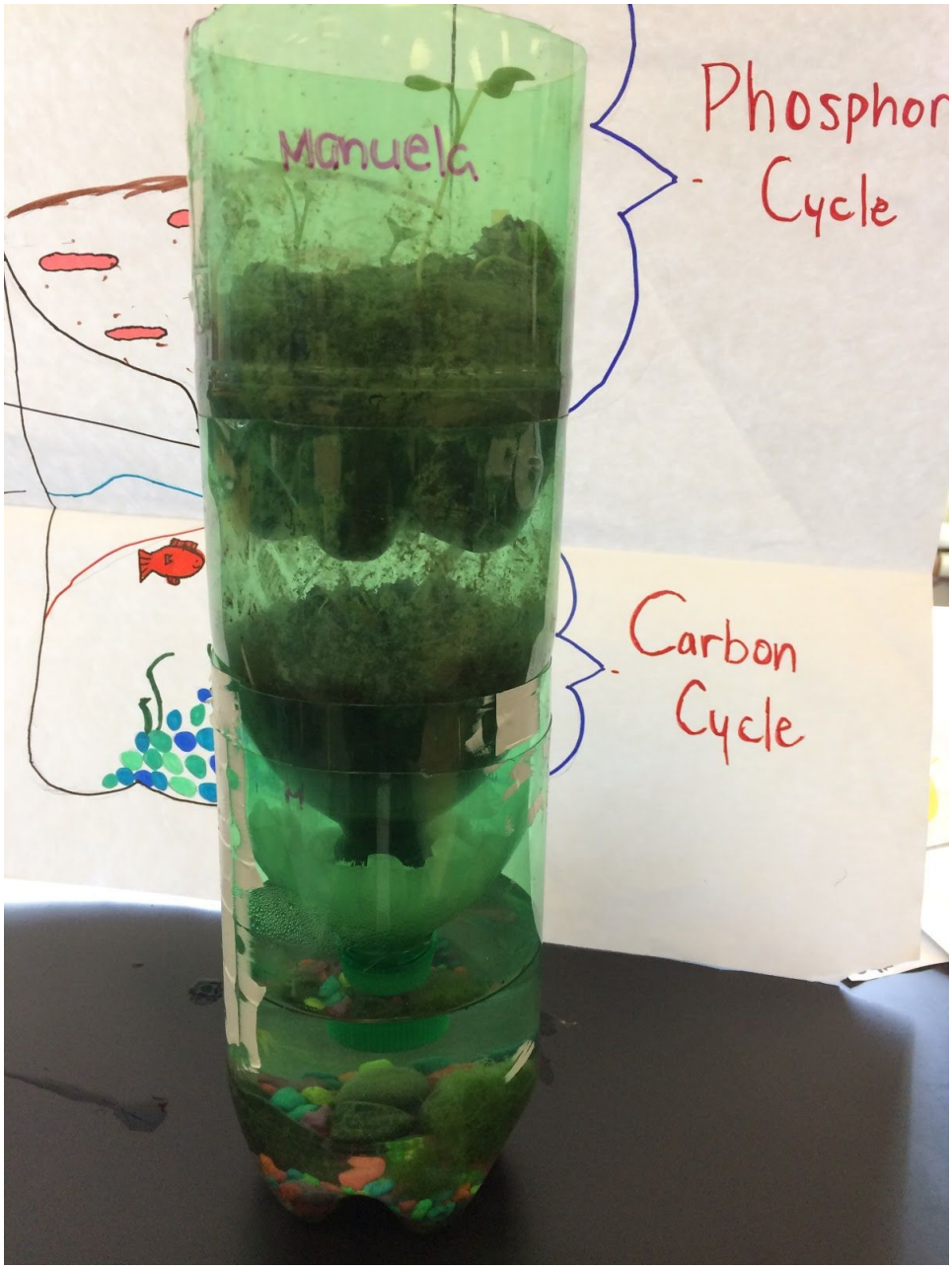
What I learned during this project is that making an ecocolumn isn't easy at all. It's a long and can sometimes be a very stressful project. You have to have a lot of patients to do a project like this. First you have to come up with a plan to see how it's all going to be put together. Then you also have to come up with a design, which can take up a lot of time. Then comes the stressful part which was actually putting it all together and gathering the materials that you will need to make your ecocolumn. Once we had everything in order we could finally have a fish in our ecocolumn and it actually survived for quite some time. It survived more than we had thought. As the days go by we had to write down everything we did for each day. In my group we had each person doing something else so it wouldn't be as stressful, but we always ended up needing each other's help. Overall, I learned that taking care of a fish is a lot of hard work. I would know because i have two fish at home.

"Redo" Statement-

Something that I wish we would have have done differently was to create a better design. I'm not saying that it wasn't good, it's just that we needed a better way to connect all three pieces of our ecocolumn. Our design was a little sloppy because we didn't really spend a lot of time thinking about how it was actually going to work. Another thing I wish we would have done differently was to have better communication and work better as a team. There was days where we focused and got everything done and there were other days where we were all over the place. Other than those two things i think we did a pretty decent job and i was happy with the results.


Carbon Cycle
Combustion gives off CO_2
CO_2
Green Plants absorb CO_2
animals respire and give off CO_2
decomposing matter gives off CO_2
animals eat plants which contain carbon.
Nitrogen Cycle
Prokaryotes in the Nitrogen Cycle
atmospheric nitrogen (N_2)
nitrogen fixing prokaryotes: convert N_2 to ammonia (NH_2)
nitrifying prokaryotes: convert NH_3 to nitrites (NO_2) and nitrates (NO_3)
Denitrifying prokaryotes: convert nitrates to N_2
Phosphorus Cycle
rocks containing phosphate (PO_4^{3-})
weathering or erosion very slow
incorporation into animals
waste and decomposition
dissolved phosphate excretion decomposition
geological upheaval
inorganic phosphate (HPO_4 & H_2PO_4)
marine sediments
incorporation into sedimentary rock (CaP, FeP, MnP & AlP)


Cut a hole on top so we can water the plants
Straw for water to get to the bottom bottle
Bottle 2
Nitrogen Cycle
plants
taped
Make a hole in cap
Phosphorus Cycle
Bottle 1
worms
Soil
Hole for String
Water
Carbon Cycle
Pebbles
uela, Ariana, Gabby


Manuela
Phosphor
Cycle
Carbon
Cycle