





How does Urban Agriculture in New York Benefit the Individual and the Population as a Whole?

Urban gardening in New York helps individuals and the population as a whole for numerous reasons. For the population as a whole it provides more oxygen in the air and it replenishes pollution. Urban agriculture also benefits individuals, by providing a community activity it brings people together and creates a community garden. Urban gardening, especially in New York, not only helps the economic growth by generating revenue but also creates a much more aesthetically pleasing society as a whole. It allows the organic produce to be much more accessible and allows the community garden to control, if any, the amount of chemical pesticides used on the produce, unlike when investing in organic produce shipped from another country. In a place like New York, where you have minimal forestry and fields of farms, urban gardening/agriculture is very important and benefits the society in many ways.



Sunflower

Objects found in the Green-market in Union Square that contain the Fibonacci spiral form.

Pink Rose

Objects found in the Green-market in Union Square that contain the Fibonacci spiral form.





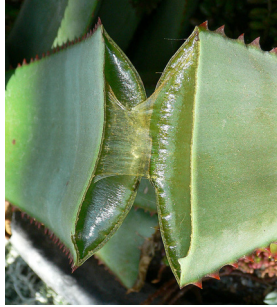


Rooftop Farming in Cities and the Microclimate on Rooftops

Rooftop farming in cities are very useful in terms of microclimate for the building as well as the city as a whole. Rooftop gardening helps the building keep warm during the winters because the soil captures the heat. In the summer the current black, metal, tar roofs make the city and the building so hot, while the rooftop garden would reflect the heat, keeping the building and the city a bit cooler. It allows organic growing and selling organic food a lot easier since they are in charge of what pesticides (if any) being used on the produce. Although rooftop farming has its perks, its main problem is dealing with the wind that destroys the crops as well as the need to have a large and steady building for the rainwater collection or the issue of runoff water.

Plants with Leaves that Collect and Store Water

Succulents are plants that have leaves that are thicker and ‘fleshy’ than usual, to be able to retain water in areas that are very dry. These plants, such as aloe, are able to collect water within the tubes of their thick leaves.



Picture from Longwood Gardens taken by Rauf654 On May 1, 2005.

Plants that Transform CO2 to O2

Photosynthesis is the process, used by plants and other organisms, of converting light energy from the sun (carbon dioxide) with water to produce sugar (glucose) as a way of fueling itself.

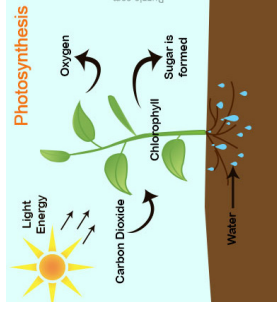


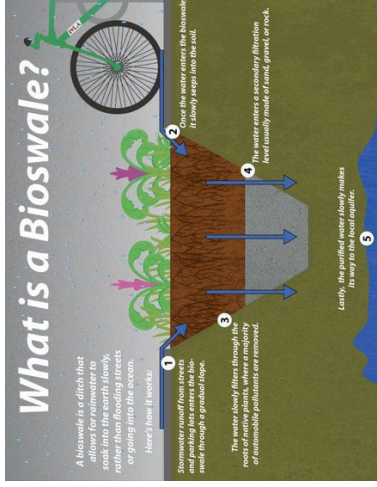
Photo by: Nicks J Last Updated: August 23, 2016

Plants that Provide Cooling

Plants provide cooling by absorbing the carbon dioxide and emitting oxygen into the air. By emitting oxygen, they cool the landscape through transpiration, releasing excess water into the air from their leaves. Surrounding plants and environment cools themselves from the evaporated water.

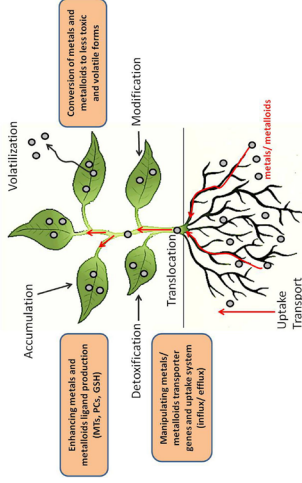
Plants that Filter Pollutants from Water

Specific plants like grass, reeds, bamboo, irises etc. help filter pollutants from water by their ability to absorb and break down the pollutants. It is one of the most natural yet advanced processes that help with water purification although the increase of buildings and structure limit the accessibility of these plants to go through this process.



Plants that Remove Pollutants from Soil

Certain plants have the ability to cleanse the soil of the Earth's toxins. This process is called phytoremediation, which is the plants' ability to absorb certain metals from the soil.

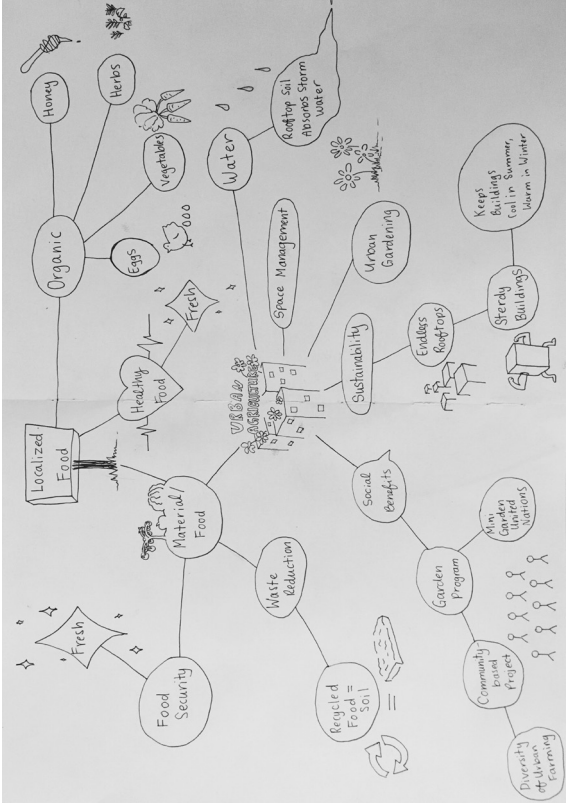


Picture by: Front. Plant Sci., 15 March 2016

Plants that Filter Pollutants from Air

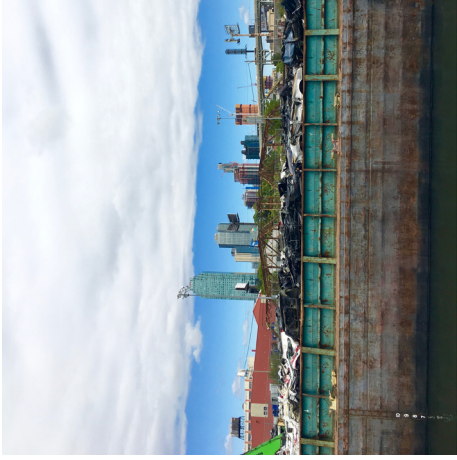
While plants are absorbing the carbon dioxide and processing it into oxygen, they are also absorbing some particles from the air creating a cleaning effect.

Urban Agriculture Mind Map





Circle Line Field Trip Photos Related to Sewage Treatment Plants, Water Pollution etc.



Guest Speakers Notes: Highlights & Water-sampling Process Photos

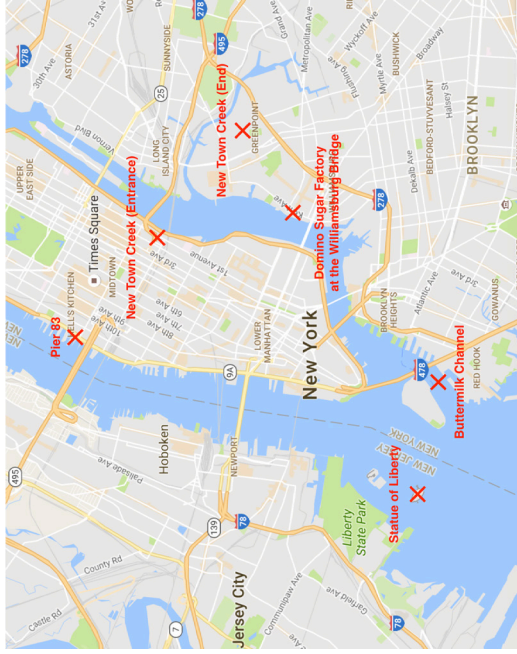


Interesting Fact: Hudson River contains enormous collections of plastic in the water

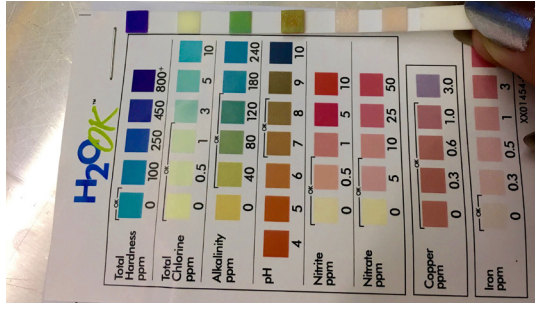
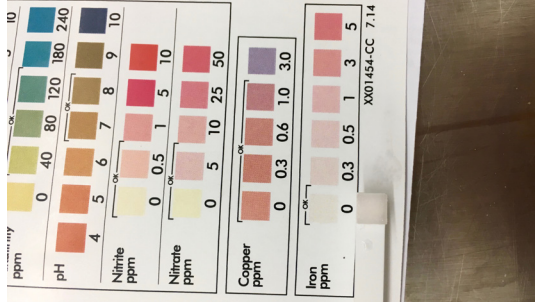
Guest Speak Quote: Fail faster to succeed sooner

Micro Fiber Issue: Problem is synthetic clothes (“plastic clothes” e.g. Nike) is shedding into our water ways. Every time we wash these types of clothes, 1mm or 1,000 microns get washed off. With each and every Patagonia jacket being washed, each time 81,000 micro fibers are being lost into the water ways, causing the micro fiber issue.

Circle Line Water Sample Locations Map



Water Test - Buttermilk Channel



Water Test Results (from all locations)

	Harbor	Statue of Liberty	Buttermilk	Domino Sugar Factory	Newton Creek (start)	Newton Creek (end)
Hardness	800+	800+	800+	800+	800+	800+
Chlorine	0	0	0.5	0	0	0
Alkalinity	80	80	80	80	40	80
P4	4	9	9	8	5	8.9
Nitrate	0.5	0.5	0.5	0.5	0.5	0.5
Nitrite	0	0	5	5	5	0.5
Iron	0	0	0	0	1	1
Copper		1	0.3	0	0.3	0.3

Water Test - Reflection

My group was in charge of testing the water sample from the Buttermilk Channel on our trip on the boat ride around the New York City skyline. There were five other water locations which were tested on, The Harbor, Statue of Liberty, Domino Sugar Factory, Newton Creek start and end. We tested 8 different substances, hardness, chlorine, alkalinity, P4, nitrate, nitrite, iron and copper. After viewing the class's results of all the locations, we realized there was not a large difference in the results. One of the largest differences that stood out was The Statue of Liberty's copper level. Its copper level was significantly higher than any other test. Its result was 1 while others had 0.3. Our conclusion to this abnormality, was that the Statue of Liberty is made of copper and is being washed by the water every day, which makes the copper be washed away with it. Thus creating the amount of copper, in the water near it, rise.

Soil Test - Reflection

Green Cap (Ph)	Blue Cap (Phosphorus)	Orange Cap (Potash)	Purple (Nitrogen)
6.0 acid	very low	very low	very low

I brought the soil we tested on from the Union Square Park, near a tree. This experiment consisted of four different tests, to see the levels of acidity within the soil. The tube with the green cap was for testing Ph level, blue for phosphorus amount, orange for potassium and purple for nitrogen. After research and discussion, we, as a group, realized that soil should have a high level of potassium because it is an essential plant nutrient, which this soil did not contain. Plants require large amounts in order to grow. Phosphorus is also a key ingredient in soil, an important cell division to develop new tissue. Which again, this soil is lacking since it resulted in a “very low” instead of medium or high.

Rice Paper

Rice is another substance to create paper. The rice straws are found in swampy forests in Taiwan. To prepare writing rice paper, the rice straws need to be soaked then boiled to break up the fibers, then pounded. You need wooden frames where the mesh of rice straws is spread out in between two frames. The frames then are then put in water, then drained and gently peeling the newly formed paper off the frames. Rice paper extraction does not harm the growth of the trees which is beneficial to the forests. Rice paper also is dyed naturally, meaning this process does not require lots of harsh chemicals which is eco-friendlier than other materials used for paper.



Bamboo Paper

Bamboo is also a material used to create paper. Bamboo is found in forests in Southeast Asia, South and Central America, and the Caribbean. It has good elements for the environment because its biodegradable, due to the fibers dissolving quickly. Bamboo paper also reduces soil erosion, do not require heavy bleaching and is eco-friendly, but would endanger the bamboo forests if it was a more common way of paper making. The process to making handmade bamboo paper includes: water, bamboo, mixing bowl, flour, spoon, mulcher, baking paper, and a blender. First you mulch the bamboo in the mulcher. Ten blend the bamboo shreds to make it extra fine. Combine flour, water and bamboo into a bowl. Spread the paste onto baking sheet, and let dry for two days.



Grass Paper

Paper can be made out of grass, grown on lawns etc. The process from grass to paper includes cutting and grinding the grass with a mortar, adding caustic soda to release the cell contents, then washing and rinsing it to remove the chemicals. After, you add bleach and boil it, then you wash and rinse again to remove the bleach, and finally forming the paper. Paper made from grasses is better for the environment, rather than wood-derived paper, because it requires much less processing.





Structural



This is a structural material that is made from agricultural waste and mycelium, an alternative to wood. I chose this as a material for a strong, rigid and straight structure because it has key components into using a sustainable and alternative material for construction. Components like being light weight, low carbon footprint, low toxicity, and biodegradable. It's easily processed into any shape or form, and it cheaper to produce since it has zero waste.



Another alternative material for structure is this rigid material that is made of corrugated paper and resin composite. It's a biodegradable material that is sourced from the wood industry waste, and the resin is formaldehyde free. It's used for furniture and construction since it has high strength and low weight.

Food Production

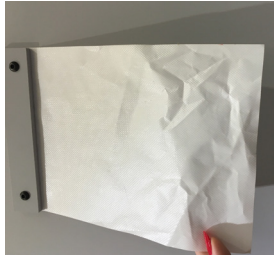


For food production a flexible or semi-flexible material is needed. This alternative material for the flooring underlayment of food production is made from granules of rubber and cork. It provides vibration damping capacity and acoustic insulation for the planting, and is a useful light weight material.

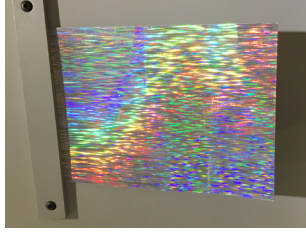


This is another material that can be used for food production due to its great skin material of flexibility. It is a light weight material made from a secretion from bacteria fed sugary solution in a warm bath (pineapple juice). It is impervious to water and has good mechanical properties such as strength. It has low toxicity, low carbon footprint, and is compostable.

Solar Energy Collection or Solar Energy Reflection



This is an alternative material for solar energy reflection because it contains many elements (polyethylene foam, nonwoven polyester, polyurethane and polypropylene) that reflect it as well as cools. The texture is flexible, biocompatible, light weight and compostable.



This alternative material can also be used for solar energy reflection due to its laminations created by transferring a thin layer of aluminum, onto the paperboard formed polymer film that is then recycled. It's lightweight, flexible, biodegradable and low toxicity.

Water Proofing and Water Collection or Water Drainage



This alternative material can be used for water proofing and water collection due to its excellent qualities. This material is woven mat from highly durable resin-coated paper yarn, which makes it abrasion resistant and water repellent. It takes the woven technique from Japanese traditional carpets from rice straws, thus also allowing it to bead off water and collect the water elsewhere. It is a lightweight material, as well as biodegradable and compostable.



This material has so many great qualities I chose to use it again for a waterproof material. It's many elements like lightweight, low toxicity, low carbon footprint, compostable, and biodegradable are all such key elements for a sustainable material. It has a skin and flexible texture, is waterproof, and had a high strength property.

Thermic Insulation and Cooling



This material can be used as an alternative material for thermic insulation due to its significant qualities. It is a lightweight material that is made from recycled PET felt, fabricated in structures designed to replace foam and down fill. The felt element is what makes this a good thermal insulator but offers better breathability than foam. To top it off, it is an easily recyclable material.



This last material can be an alternative material used as a cooling element. It has a thin and flexible texture, and it is made from banana plant trunks. It is biodegradable, has low toxicity and is a light weight material. It is used to block out the sun to provide a cooling effect.

CLIMATE

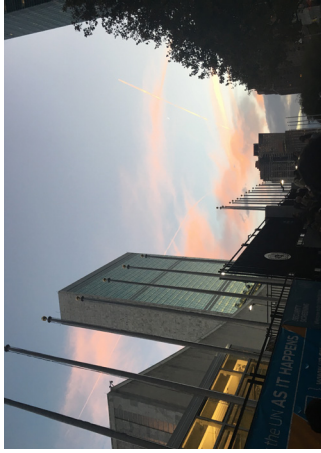


World Map of Affected Areas or Potentially Affected Areas by Extreme Flood and Rain

My extreme condition is flooding. This map represents the areas which are or can be affected by extreme floods and rains, by the blue water ripples. The red 'x' marked in India, Uttar Pradesh, is the area I chose to investigate further for flood conditions. In Uttar Pradesh, a common material they use for construction is tension fabric. Tension fabric provides protection against the weather, quicker to make and cheaper to produce.



United Nations Visit - What My Action Could be as a Designer in Dealing with Climate Change.



I know I can't reduce the number of tech products, but my plan would be to change the materials used in creating these tech products. Materials that would help and allow them be biodegradable or easier to recycle.



My question to the panel was that even though I am in the design and technology major, and they kept referring to clothing 'waste' that needed to be reduced, how was technology a part of this waste? They answered that it was most definitely part of the waste, since tech products are not biodegradable or sustainable.

Climate Refugees: The Global Impact of Climate Change

After watching “Climate Refugees: The Global Impact of Climate Change”, I discovered new facts about today’s issue on refugee migration. Firstly, the reasons why people are leaving their original home is due to climate change. Those people are forced to either temporarily or permanently move away from their homes, because the living conditions changed for the worse. Due to extreme climate conditions, refugees have been moving to various different places like America, Europe Australia etc. If they are permanently moving away that means they have to take everything they own and carry it on their backs, because migrating is never easy and no one is helping you move your stuff.

The large amounts of people migrating to specific places does cause a concern on those places everyone is moving to. Those countries that are taking in all these new people will start having problems due to shortage of food, water, space and other resources.

If a nation is moving to another nation, will the moving nation have to accustom themselves to the new nation? Or will both have to learn to coexist?

The definition of a refugee is someone who is forced to leave their home by natural disaster or other situations. These people are forced out of their country which is why we need to let them live elsewhere, because it isn't necessarily their fault that area is not suitable anymore. But allowing everyone move into other countries does affect those places drastically. A lot of questions will rise.

To change the number of climate refugees in the future it will need to take a large action by a large number of people. These areas of land are collapsing because of years of people disrespecting the Earth and mother nature acting up. For me as an individual, to try and decrease extreme heat stations, I can use less CO2 by walking more, using less fossil fuels.



This an image of a tiny island that is slowly sinking away by drastic rain and flood situations.



ENERGY

Off-grid Energy



Off-grid energy is something that can work without using public utilities, or other electricity. The advantage is that it does not need electricity to be produced, but the disadvantage is the cost of setting up. Energy grid is something that is powered by a connected line of transmission system of electricity.

Solar energy is a common way to generate electricity. Its positive attributes is the fact that once they are installed, the person does not need to pay for electricity anymore. Though the solar panels do need maintenance and take up a large amount of space.

Wind energy is great since it is pollution free and cost-effective. Though it does not have a reliable wind strength to produce energy every day.

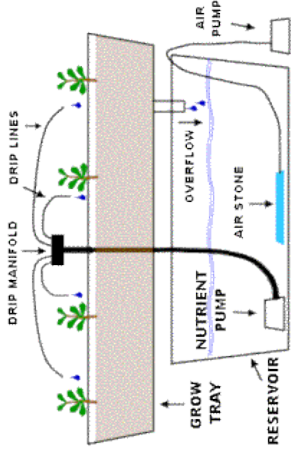
Off-grid Energy



Many places no a days have various different types of air purifications to clean the smog out of the air. Many places like China and Los Angeles have many pollutants in the air. Renewable energy is collected from nature locations, like sunlight, wind, rain, tides, waves etc. To have a mobile renewable energy is like a solar panel controlled car, it's source of energy is natural.

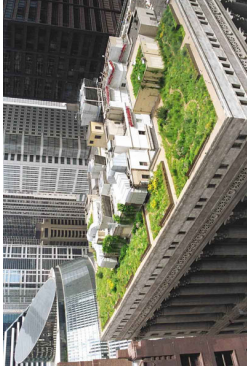
A shared energy is having a whole block of houses' energy being supported by solar panels. All the energy in multiple homes that come from one place.

Hydroponic System



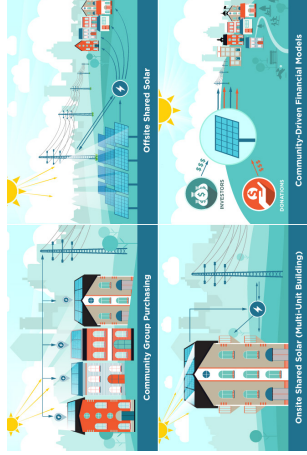
A hydroponic system is where a structure is able to grow plants without soil, only water with specific nutrient solvents. The pros are that it doesn't need soil, the growing time isn't an issue, and the heavy work is reduced. While the cons are that skills and knowledge are needed to tend the plants correctly, so the staff will be specific. Since the plants share the same water solutions, disease spreads quickly. And lastly, not all plants can be grown this way, so this limits the plant types.

Rooftop Greenhouse



Rooftop gardens have many positive elements to them, as they can create insulation in the winter and keep the building warm. As well as keep the building cool in the hot summer's because the roof wouldn't be a black sheet, instead it would reflect the sun. They also can use hydroponics to recycle their water, and since hydroponics are flexible to size, they can expand their crops by a lot and produce crops faster.

Renewable Energy Sources for Neighborhoods



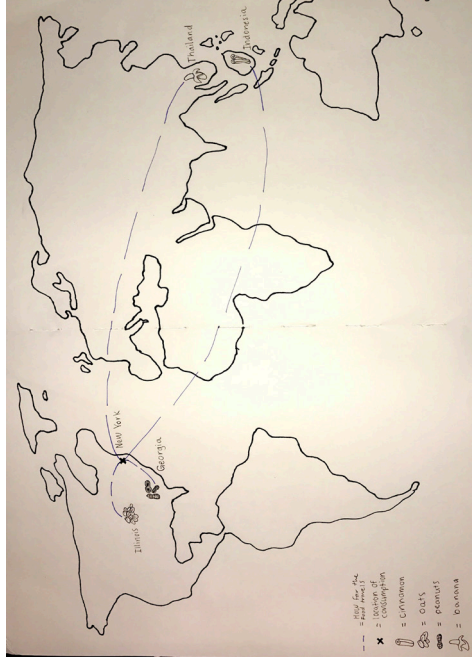
Neighborhoods can improve their energy aspects by sharing their energy sources, and those energy sources being off-grid. For example, a community can produce their shared electricity from an off-site solar panel system. Or in a city, the roofs of the skyscrapers can have solar panels to produce energy for all apartments in the building.



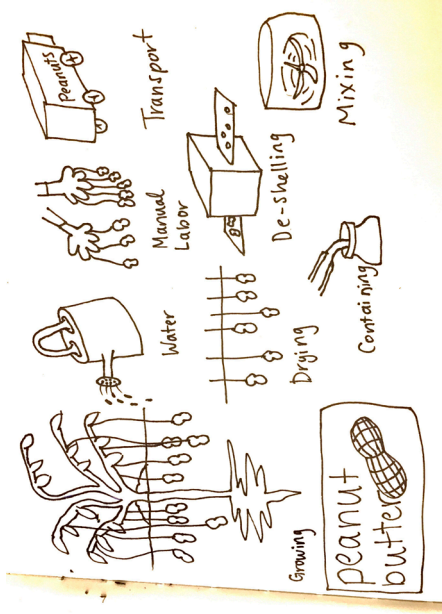
What I Eat and Where it Came From

When I reflected on what I had to eat the other day, I always start my morning with oatmeal. I have oatmeal with banana, peanut butter and cinnamon powder on top. We were to trace each ingredient that went into the food we chose to eat. My oatmeal brand produces their oats in Illinois, USA, peanuts for their peanut butter in Georgia, USA, bananas from Thailand, and cinnamon from Indonesia. I marked this on a

map using symbols of the ingredients to represent where they were produced. The dotted lines represent the distance it has to travel in order for me to consume the product in New York.

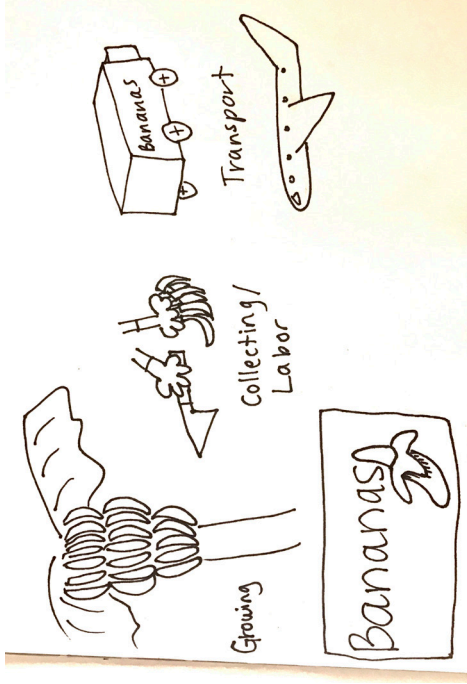


Process of Peanut Production



The next two photos represent the relationship between two of the ingredients I researched, between the plant, people and production. Each photo shows the elements that go into creating and transporting the product.

Process of Banana Production



Self-organization in Living Systems in Animal Life

When researching about animals that huddle together, I came across very interesting facts. Penguins, for example, huddle when the winters get really cold, to create heat. They take turns who gets to be on the inside of the huddle for warmth, but then exchange to the outside. Penguins do not necessarily have a penguin in charge, or a type of hierarchy. Which means they are all equal, and they all deserve to spend time in the middle for warmth, and take one for the team to keep others warm when they are on the outside.

Flocks of birds also create groups for protection, warmth, mating, and to help raising families. These are beneficial qualities all birds can enjoy, which creates a safe space for all members of their flock.



Self-organization in Living Systems in Animal Life



Ants also had a fascinating fact about taking one for the team. In flood type situations, they create a raft of combining their own bodies. This raft would prevent the whole group from drowning, but does mean a few ants have to be sunk under water. They too take turns who gets to be where, but it's the interesting fact they stick together so well.