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STUDIO JOURNAL

DESIGNING
SUSTAINABLE
NOMADIC
STRUCTURES

Aaron Norman

SUSTAINABLE SYSTEMS

PARSONS THE NEW SCHOOL FOR DESIGN , SPRING 19
INSTRUCTOR: CAROLIN MEES

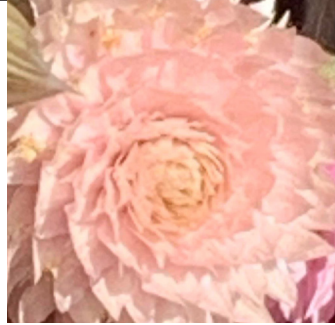
GLUE STRIP



GLUE STRIP

SOCIAL & SYSTEMS





The Fibonacci sequence is a set of numbers that starts with a one or a zero, followed by a one, and proceeds based on the rule that each number is equal to the sum of the preceding two numbers. ... $F(0) = 0, 1, 1, 2, 3, 5, 8, 13, 21, 34$. I was out walking and this was before I went to the union square market I stopped and took pictures of flowers which in my head is a pretty basic example of

the fibonacci spiral. When I arrived at the market I really wanted to find some sea food to represent the spirals but ended up finding none at the markets that day, there were mostly flowers and vegetables that did not completely fit the definition of the fibonacci sequence. I did so happen to come upon a stand with organic loose red beets and the spirals within the veggie were very unique and definitely my favorite find throughout this process.

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Final wheatgrass growth and the roots of the palnt



Things I think are necessary for the wheatgrass to grow is an environment that gets sunlight periodically throughout the day, I placed mine on my dorm room desk. I also poked holes in the bottom of the cup and placed the plant in a bowl to catch the water that was extra after each watering. I used warm but not hot water each time because plants are used to getting warm water due to them usually sitting in the sun. She first sprouted up a week after being planted then I started to document

each day or every three days. A better version of a container could be a glass or see through container of any material so I would be able to see the roots grow and observe the water distribution, I would also place a uv lamp on top so the plant would grow better in doors, the lamp would be attached to the container and it would be small so it's not too overwhelming. And possible the container is like a terrarium and a desk lamp so it has two functions.

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SAVE THE WORLD CAP



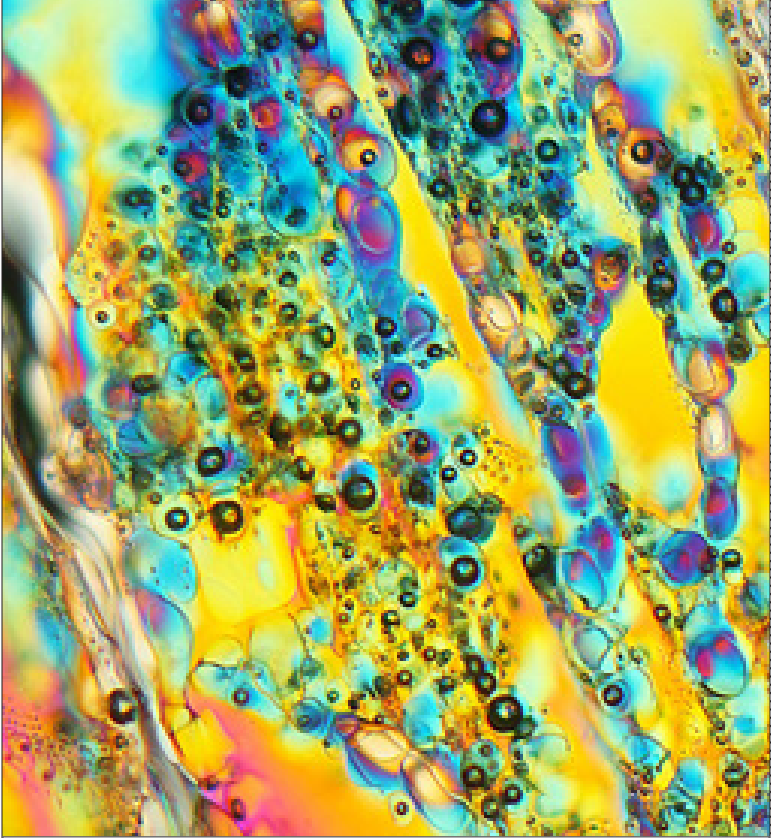
I used multiple pieces of cardstock to make the hat diverse and full of color. I used four different colored pieces of the cardstock that I cut into spirals to make the full structure of the hat, each connection was made with a round head fastener. The hat does fit on multiple sized heads. The hat is made to hang down over the face and any side of it helping protect from the sun,

but since the hat is made essentially from paper I don't think it would last to long against rain. The hat has a few spots were its open so the head will get air circulation, also the hat stays balanced well on the head allowing you to place it in many different angles. The shape is very unique making the hat have a very flowy look to it.

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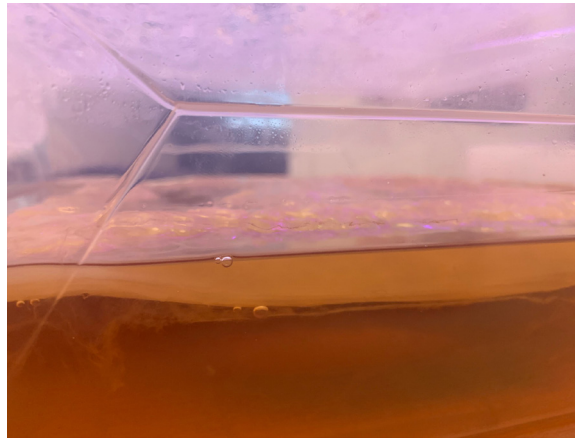


GLUE STRIP

WATER & MATERIALS



Biolether



Scoby consists of a symbiotic community of bacteria and yeast. Microbes generate material unlike plastic and steel. The growing conditions for biolether need to be in a undisturbed location, at 75 degrees, clean container so mold won't grow. I chose to put the solution in a clear container on top of the fridge in my dorm because it's really warm up there. The scoby feeds on a solution

of tea, sugar and apple cider vinegar. The biolether needs two weeks to grow and needs to be placed on a wooden slab to dry.

GLUE STRIP

Design of a wearable, thermic insulated rainwater-collecting object



Innovative Water Solutions

What is necessary to collect rainwater? capture the free water falling on your roof and direct it to a rainwater storage tank. Rainwater harvesting is collecting the run-off from a structure or other impervious surface in order to store it for later use. Traditionally, this involves harvesting the rain from a roof. The rain will collect in gutters that channel the water into downspouts and then into some sort of storage vessel. Different methods used are RAIN BARRELS

- This involves installing a barrel at a gutter downspout to collect rainwater. DRY SYSTEM - the collection pipe dries after each rain event since it empties directly into the top of the tank. WET SYSTEM - This method involves locating the collection pipes underground in order to connect multiple downspouts from different gutters.

Thermal Isulation

What is necessary to provide sustainable thermic insulation? Its necessary to be a sustainable material that is eco friendly, Cellulose is a eco friendly insulator with a r-value of R-3.5 per inch, similar to fiberglass, but even better it's made of 80 to 85 percent recycled newsprint. And the other 15 percent borax, boric acid or ammonium sulfate to make the newsprint fibers more fire resistant.

Another recycled material that is coincidence dently used in fashion is denim cotton, scraps of denim can be recycled into cotton insulation. About 85 percent of this material is made from recycled denim, while the remaining 15 percent is comprised of plastic treated with borate, the same fire retardant and insect repellent used in cellulose. The material delivers an insulation rating of about R-3.4 per inch.



inspiration.news

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What are the material qualities that you are looking for? You should question if the material is lightweight or heavy weight, the longevity of the material, expectations to target audience, for example is the material comfortable?, body cooling?, body heating? In terms of materiality, sustainability and design, how can thermic insulation and water collection be addressed at the same time?

You can use both in the making of clothing with the ability to collect rain-water yet, keep a human comfortable, cool or warm.



brooklyninsulation.com



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Wearable Rainwater collector



The umbrella, something used by people each time it rains is an obvious accessory that can be used for rainwater collection. My idea is to have a lip on the outer circumference of the umbrella so when water hits the top it will slide down the top and won't hit the ground but fill up in the lip where it will then filter into holes acting as funules directing the water through the shaft of the umbrella and through retractable cables placed in the base of the umbrella handle that can be plugged into the cargo pants that have pockets on either leg to store the rain water. In real life the pockets that collect water will be made from a clear material that won't let the water seep out. Another idea of mine is to have rainwater collectors near most blocks the same as there is trash cans so when someone's clothing item fills they can unload and keep collecting.

Natural Dyeing

haotags.com



How is the color pigment extracted from the plant and fixed to the cellulose fibers? Through the use of mordants. What is a "mordant" and what can be used as a mordant? Substance that has the property of fixing or setting colors into fiber. Aluminum Potassium Sulfate, Iron (Ferrous Sulfate), Soda Ash (Sodium Carbonate). Does natural dyeing work without a mordant? From what I can gather no because we needed to use one for this whole experiment. But I do wonder what chemicals people would have used over

two hundred years ago so possibly yes. What do you find out about dyeing and water pollution? Chemical dyeing is toxic and can pollute water in the case that the fiber used does not absorb all the water. The growing and production of natural dyes has the potential to help support smaller farming and artisanal economies and the use soil to soil production systems can help decrease carbon and produce no waste. Why is natural dyeing healthier for the environment and humans than chemical dyeing? The use of natural dyes don't use toxic chemicals that can negatively affect humans, though natural dyeing takes a lot water the trade offs seem to be worth it to environmentalist. Certain types of cancers were linked to exposure of early aniline dyes. How could you waterproof nature dyed wool and bioleather? One could spray the material with waterproofing spray sold at stores today.

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Natural dye paint choices



I chose to use strawberries and blackberries because the fruits will hopefully produce a lot of natural juice that can be mixed into the water and mordant to be soaked up by the dye the wool. The wool is also white so I want to see a dramatic change in the color pigment. Red and black are also top three colors for me so the decision is also because I like these colors. I also picked a third color which is orange and I used carrots.

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Funelbrella



The Funelbrella is an umbrella able to capture the water that drops down from the top during raining, this rain collects in a lip around the rim of the umbrella that guides the water down through the umbrella shaft and handle, there the water funnels through two retractable cables that connect to the water bags on the cargos. Ideally there would then be water collection bins placed around the city of new york. This would be for people whose various water collectors have been filled and can empty them to collect more water and get rid of the added weight to their body.



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Bioplastic



a- What interests you in your specific make-your-own-materials-experiment? I'm interested in the bioplastic because it's sustainable and it will hold up for a while. I've never made it either so it would be fun to make.

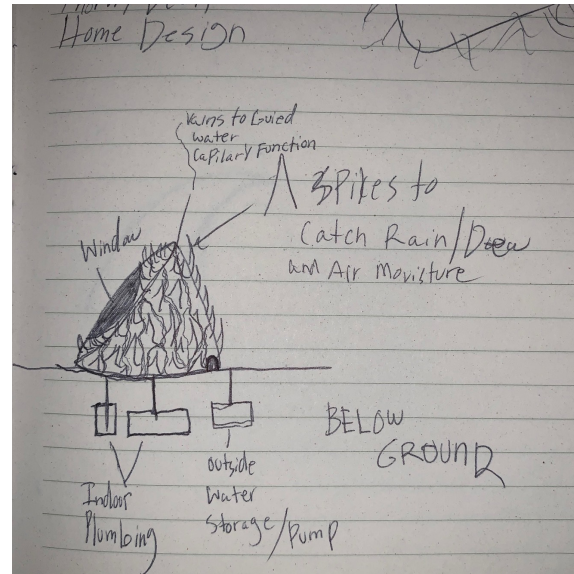
b- Why is your specific self-made material sustainable? Bioplastics are plastics derived from renewable biomass sources, such as vegetable fats and oils, corn starch, straw, woodchips, food waste, etc.

c- What are the qualities that your self-made materials will

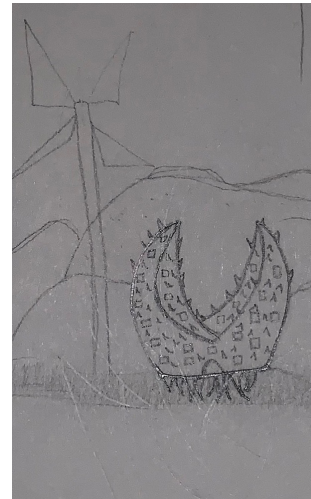
have and what unsustainable materials can it replace? It can be a color I chose and the material can replace stained glass, or even small household items like forks, spoons and pipes.

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Biomimicry



The materials used could be the type to make an inflatable but more than likely of a sustainable material that can be 3D printed. The energy would be gained from solar panels on the window side of the home and wind turbines on the outside and around the structure. The structure collects water like the thorny devil, the water collects from moisture in the air and from rain storms then it will filter through the spikes and small holes where the water collects in the base plumbing of the house and can be pumped up through the home for plumbing and drinking.

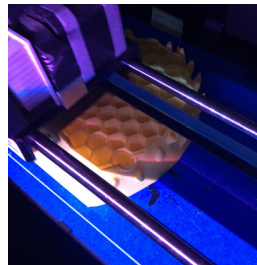
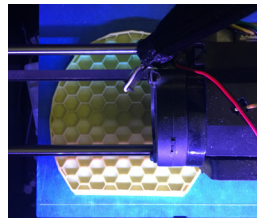


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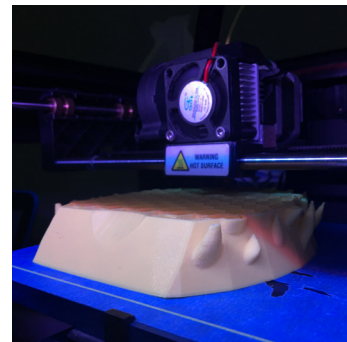
Biomimicry



I made my model from clay assuming it would be an easier material to work with. Also clay is reusable.

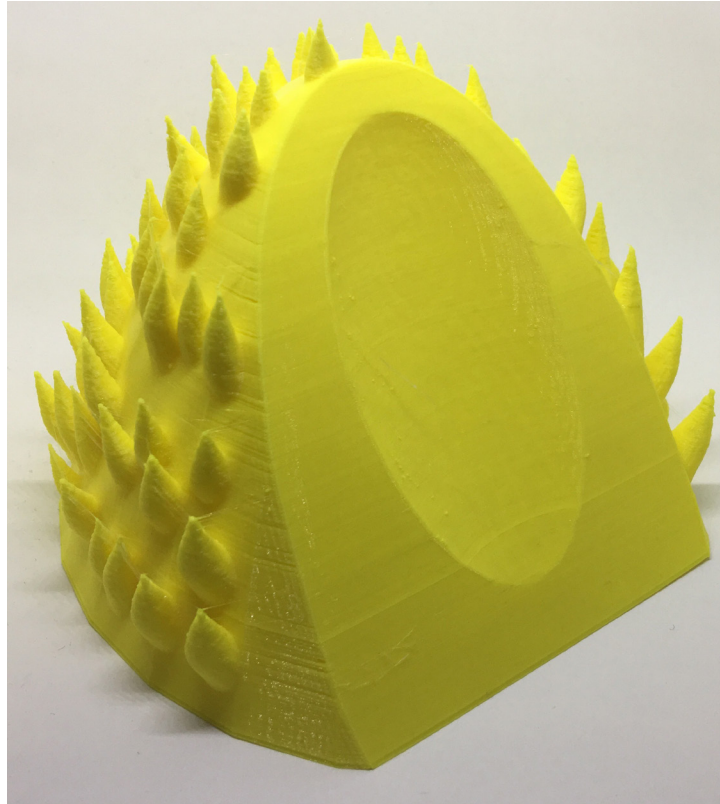


In progress shots of the model being 3D printed



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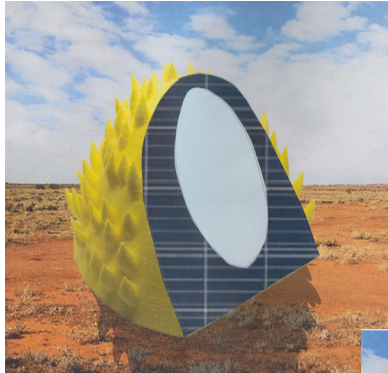
Biomimicry Final Model



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Final 3D Printed model of the structure. This building is designed to mimic traits of the thorny devil. The thorns are meant to collect water from rain storms and moisture in the air.

Biomimicry Model Drawings



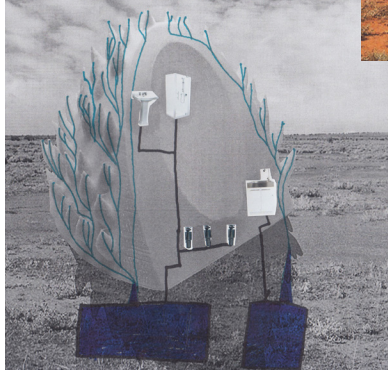
Solar panel and window



Interior garden

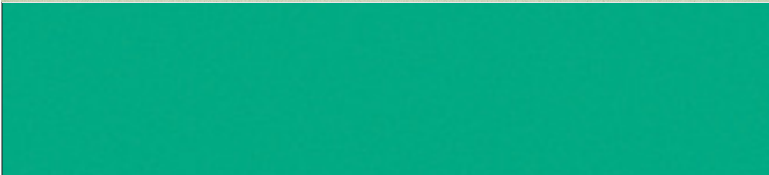


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Plumbing



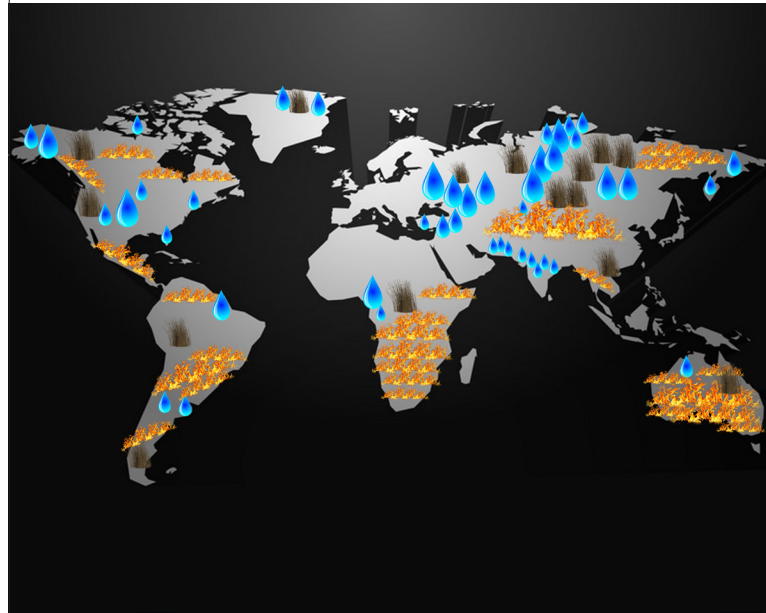


CLIMATE CHANGE



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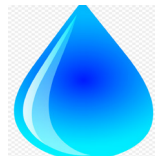
Global Drought Map



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Drought Area



No Drought Area



Little To No Drought Area

People of Drought



Someone living in a drought area would be living with little access to water, the soil wouldn't be producing good or any food and depending on the surroundings it could be grassy and dry or in a desert landscape. I would want my shelter to be able to provide a place for good food production and water storage/production. The shelter would be broken up into pieces that can inflate and link together, in theory people would travel in big groups and each person would carry a particular piece of the shelter weather it be the solar panels and wind turbines for energy collection, or the inflatable pieces that when blown up and sealed link together to make rooms fro food growth and spaces for people to eat and sleep. The inflatables would deflate into book bag shapes or possibly outer layered clothing items the people could wear to beat the heat and collect water while walking.



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Thorny Devil



(a) Animal's body function to adapt to extreme climate: How is the animal able to adapt to the extreme climate condition at the location that you choose in the previous assignment?

The Thorny devil lives in Australia, their range covers most of arid Australia – large parts of Western Australia, the southern half of the Northern Territory, South Australia and western Queensland. They live in dry sand country, spinifex grasslands and scrub. Thorny devils have a bimodal seasonal pattern of activity. They are almost completely inactive during the hottest summer months (January and February) and the coldest winter months (June and July), when they take refuge in underground burrows. Thorny devils are active in the autumn (March, April, and May) as well as the later winter through early summer (August – December), during which they mate and lay eggs. (b) What techniques does its body have to adjust?

They concentrate and drink dew. Not only does their spiny armor protect them from predators, it also helps them absorb water in their arid habitat. There are hygroscopic (moisture-attracting) grooves between their thorns. They obtain water from the dew that condenses on their bodies overnight, during rare rainfalls, or by brushing up against dew-coated grass. Any water that gets into the grooves between its thorns is drawn by capillary action to its mouth, allowing the thorny dragon to suck water from all over its body. They are also able to bury themselves in the sand to draw moisture from it. (c) How does the animal's self-built structure look like? What materials are used to adapt to extreme climate? How are the materials suitable for the animal's structure because of their tensile strength and other qualities that are beneficial in terms of sustainability and extreme climate change adaptation such as UV-resistance or antibacterial qualities etc? The thorny devil finds shelter underneath sand, this is natural because they are using the environment that is already provided to create their shelter, the other reason for this is so the lizard can collect water from the sand and use it to drink due to its inability to drink from puddles of water.

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