UTI TEST STRIP TEST REPORT

The CocoCup

Prepared by

TEAM 2
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EDSGN 100.006

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Testing Report Summary

Table 1: Summary of Testing for Prototype 1
Test Date/Time/Location: September 22, 2014 / 8:00 AM-9:55 AM / 316 Hammond

Requirement Tested	Method of Testing	Results	Pass or Fail?
Versatility	Can the coconut plan be altered to work in places other than Somalia? We tested other types of cups to see if they worked equally successfully.	The avocado worked similarly to the coconut. It was smaller which made aiming significantly more difficult. It can be assumed that there are similar fruits that can be made into cups in other parts of the world, also.	PASS
Simple, dipping method	What is the best way to dip the UTI test strip into the coconut/avocado cup? We tried a stick method and a string method to see which worked most successfully.	Stick: Putting the UTI test strip on a stick did not allow the strip to be completely submerged when using the avocado. It did however work for the coconut. Sting: tying a string to the test strip allowed the strip to be completely submerged in both cups.	Stick-FAIL String-PASS
Sanitary	Will the urine stay in the coconut before being disposed of? We used a squirt bottle to aim into the coconut and see whether or not the urine (water) made it into the cup and stayed there.	Though the idea made sense, we discovered that it was difficult to aim and some of the "urine" splashed upon entry.	FAIL
Easy to use	Is the design difficult for others to understand? Can it be used by anyone? We all practiced aiming a squirt bottle into the coconut, and questioned others on their	Everyone believed the idea was simple to understand. It does not take a lot of cognitive processing to simply pee into a coconut half.	PASS

	opinions about the understandability of our method.		
Waste-free	Can the coconut be disposed of easily after using it? What are other uses for the parts of the coconut that are not being used? We determined this based on research and brainstorming.	The inside of the coconut (meat and milk) can obviously be used as food sources. The other coconut half can be used as a second cup. Also, since the coconut itself is natural. It can simply be buried, and is biodegradable.	PASS
Water-proof storage method	Will the coconut/avocado hold the urine? We used water as a substitute for urine and tested how long the coconut could hold the fluid before leaking.	The coconut held the water for the entire class period. There was slight leakage due to a crack in the coconut, but not enough to cause any alarm. The leak was due to poor cutting methods which can be factored out since it is assumed the Somalians will be more experienced in using coconuts.	PASS

Observations Summary:

The core plan of our prototype was ultimately successful and versatile. The "coconut cup" will hold urine successfully for a short period of time, or even an extended period if necessary. They are plentiful in Somalia, and they can be disposed of easily. Additionally, the other parts of the coconut can be "recycled" and have a variety of other uses which would ultimately make the prototype entirely waste free. The only dilemma we observed was difficulty aiming into the "coconut cup" and a slight splash which could lead to unsanitary conditions. The difficulty of aiming was fairly expected, and our group has been brainstorming solutions for a while which we will try to implement in our second prototype.We also tested two separate ideas for the "dipping" process in which UTI strip will be placed in the cup of urine before being read. The first plan was to connect the strip to a stick and simply dip the stick into the urine. This worked well with the coconut, but proved much more difficult with the avocado because of the smaller size. Our second plan was to connect the strip to a string and submerge it almost like a tea bag in a cup of tea. This allowed the test strip to be completely covered and worked significantly better than the stick idea for both the coconut and the avocado.

Image 1 - The coconut and avocado shell proved capable of holding liquids without leaking.

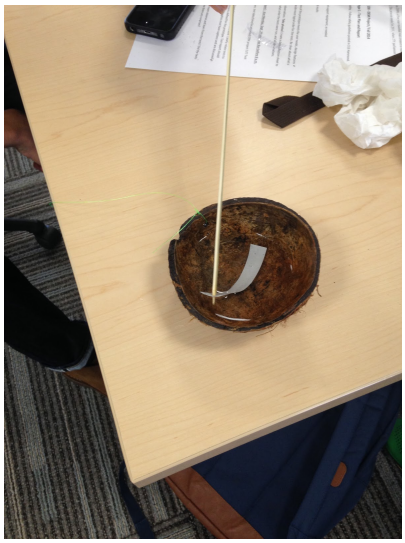


Image 2 - We tested the strip by attaching it to a stick and inserting it into the coconut. This proved to be a fairly successful way to use the strip in this situation.

Image 3 - Jeremy testing the CocoCup's ease of use and ability to hold liquid

Image 4 - Inserting the test strip in the avocado. Fully submerging the strip proved much more difficult in this situation, most likely because of the smaller size of the avocado.

Re-Design Ideas/Thoughts for Prototype 2:

We plan to keep the core idea of using a "coconut cup;" however, we want to make it easier to aim and more sanitary. In order to do this, we plan on creating a sort of funnel that will allow all the urine to enter the cup without splashing out or missing in general. The most difficult part of this process will be finding a similarly waste-free material to use. Another goal will be to test even more substitutes for the coconut, like the avocado to see how many places around the world our method can succeed, for example, a pomegranate.

Table 2: Summary of Testing for Prototype 2
Test Date/Time/Location: October 6, 2014 / 8:00 AM-9:55 AM / 316 Hammond

Requirement Tested	Method of Testing	Results	Pass or Fail?
Stability and Ability to Hold Liquid	Each container will be tested, using a squirt bottle filled with water, to observe its stability when being filled with liquid as well as its ability to hold that liquid.	The pomegranate, avocado, and coconut were all able to hold the water successfully. The coconut was slightly unstable when the water was poured into it, but nothing spilled out of the shell, and the avocado and pomegranate were both stable.	PASS
Easy-to-use	Obtaining data through questioning women (mostly mother's visiting on parent's weekend) on our product's comprehensibility.	8/10 women agreed that they would be able to understand the directions given and use the product.	PASS
Easy-to-build	Experimenting with different ways to build the funnel and increase its stability	The simplest way to build the funnel was to hydrate the corn husks with water in order to make them more pliable. The husks were folded around the edges of a cup into a funnel shape and the bottoms were tied together. Once the corn husks dried it was able to be removed from the cup and the funnel held its shape.	PASS
Sanitary	Using a squirt bottle with the funnel to determine if it reduces splash and increases aiming abilities	The funnel made it significantly simpler to make all the fluid enter the cup.	PASS

Adaptable For Different Areas	Experimented with different fruits from various regions of the world so ascertain which would hold water	The pomegranate was able to hold water successfully.	PASS
Waste-Free	Researched the different materials used in the product, ensuring that they were all biodegradable, recyclable, or easily burned.	Teslin paper is both recyclable and easy to burn. Coconuts shells take a very long time to biodegrade but can be burned very easily when it is time for them to be disposed of. The rest of the components, such as the pomegranate and avocado shells, corn husk, and string (if a natural material, such as hemp, were used) were all found to be easily biodegradable as well.	PASS

Observations Summary:
Our main goal this testing session was the develop the funnel as a means of getting the urine into the coconut, avocado, and pomegranate as easily as possible. Though aiming successfully into the coconut proved fairly easy without the funnel, it was much more difficult to make sure the water didn't spill out of the shells. Once the funnel was constructed, however, it made the process much more streamlined and user-friendly. We also tested another method, a ramp made of corn husks, but this was extremely unstable and fell apart when it was used, proving to be completely ineffective.

Image One: Taylor in the process of constructing the funnel.

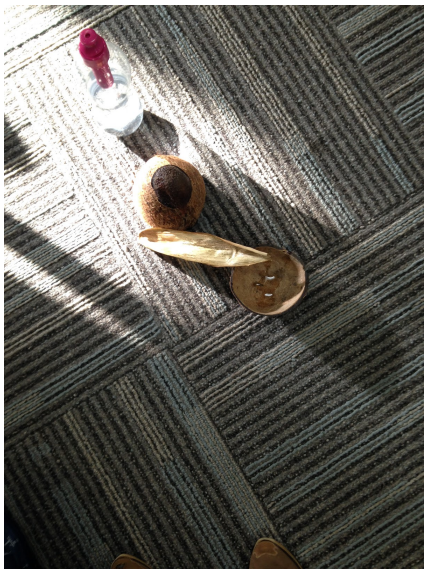


Image Two: An alternative to the funnel, a ramp made from corn husks, was also discussed, but proved ineffective when put to the test.

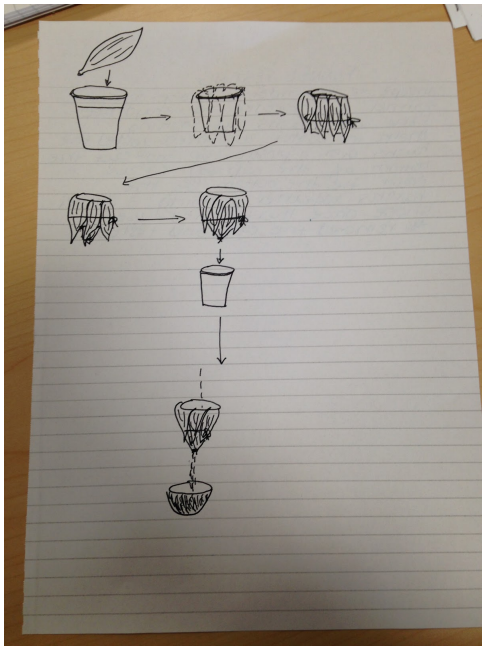
Image Three: The pomegranate was tested and was able to hold water effectively while maintaining stability.

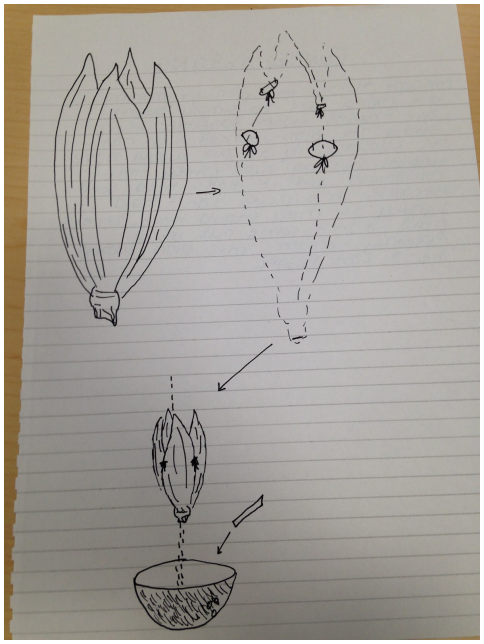
Image Four: The funnel was tested, effectively transporting water from the squirt bottle to the cup more easily.

Cost Analysis:

The core of the CocoCup is entirely cost free. The materials for the funnel (corn husks) and the cup itself (coconuts) are readily available across the Somalia and can be found lying around. As a matter of fact, coconuts are so common that they are almost considered a waste product in their own. The true cost lies in the string/hemp and the strip itself. The cost of the strip was predetermined by the HESE program and is under a dollar. If we were to use hemp to dip the UTI test strip, this would be a relatively inexpensive add-on. One yard of hemp costs around $1.23, if purchased from the leading producer. It only takes about 4 inches for each strip, so the relative cost of hemp would be about 14 cents per strip.

Product Guides:





Re-Design Ideas/Thoughts for Prototype 3:

The testing process of prototype two revealed some areas for improvement in the design. One potential redesign for the CocoCup involves the creation of a stand mechanism to steady the coconut during use. While testing the CocoCup's ability to hold liquid, it was observed that the coconut began to tip and spill over, and at times, it had to be held upright. The potential spilling of urine presents a sanitation concern for users of the CocoCup. Ideally, the CocoCup would be re-designed and incorporate a base made of rocks to increase the steadiness of the product. Additionally, we could try to find a better way to "dip" the test strip into the sample. The current prototype has a string tied to the strip; however, if we were to change this slightly, we would utilize a piece of hemp, which degrades at a much faster rate.

Sources/Works Cited:

list any sources of information or references used in your report, such as costing information, etc.

http://www.hemptraders.com/Hemp-Rope-s/1513.htm
http://www.teslin.com/Home.aspx