Peel-N-Test

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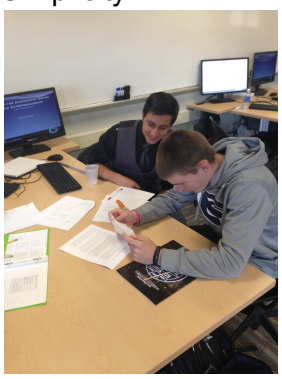
Final Test Report

Table 1: Prototype #1 Testing

Test	Results
Simplicity  Figure 1: Students trying to use the UTI test strip prototype 9/22/14, 8:20 AM, 316 Hammond	Test: Test strip was handed to subject to see if the subject was capable of using the strip with only the instructions on the package. Results: Fail Subjects were capable of using the test strip, but did not know how to read results. Modifications: An example of a positive test strip would be added to packaging for comparison.
Protection Figure 2: Pouring water on the prototype to test the protection 9/22/14, 8:25 AM, 3rd Floor Hammond Hallway	Test: Water was poured on to the strip in the packaging to see if the strip is susceptible to the outside environment. Results: Fail The strip got wet and the instructions became illegible. Therefore, the test failed and needs to be improved. Modifications: Text instructions will be printed on packaging and the strip will be placed in a better sealed packaging (Zip-lock bag).

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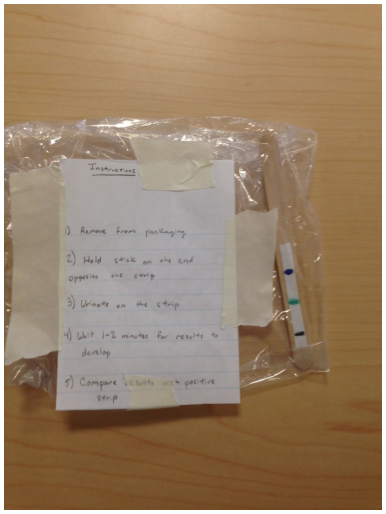
<tr>
<td>


Figure 3: Instructions printed on the front of the prototype
9/22/14, 8:30 AM, 316 Hammond
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Affordability

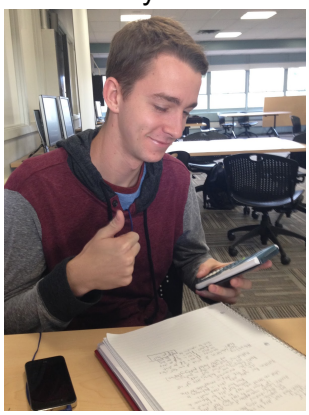



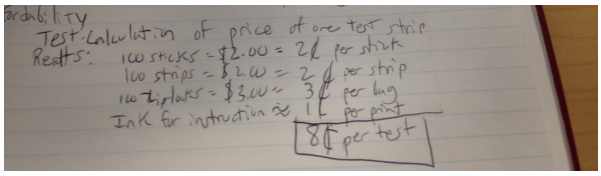
Figure 4: Russ approving of the price per test
9/22/14, 9:34 AM, 316 Hammond


Figure 5: Calculation of the price per test
9/22/14, 9:35 AM, 316 Hammond
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Test: The price of one test strip was calculated:

Results: Pass
100 Popsicle sticks= $2.00= 2 cents per stick
100 UTI test strips= $2.00= 2 cents per strip
100 Ziploc bags= $3.00= 3 cents per bag
Ink for instructions= 1 cent per print
Total: 8 cents per test
The test costs less than the minimum wage per hour in Cameroon.

Modifications: None necessary
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<tr>
<td>Usability</td>
<td>
Test: A water squirt bottle was used to simulate urinating on to the test strip to see if it is easy to activate the test.

Results: Pass
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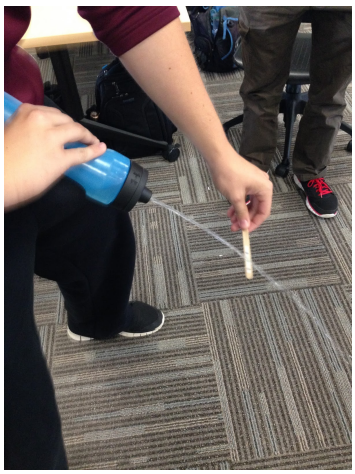
 Figure 6: Joey squirting the test strip with the squirt bottle 9/22/14, 9:45 AM, 316 Hammond	All four group members could easily activate the test strip. Modifications: None necessary
Appropriate Size Figure 7: Justin showing the design fits in the average pant pocket 9/22/14, 9:55 AM, 316 Hammond	Test: The strip was tested to see if it could be held on person by placing it in the pockets of our group members. Result: Pass Test strip fits in most pockets Modifications: None necessary

Prototype #1 Observation Summary:

While testing our prototype, we recognized both positives and drawbacks to our design. The test results were extremely important, because it shows the major flaws our design currently has. We found our instructions were not explicit enough for people to understand completely, so we know we must change that in the next prototype. After testing the protection, the packaging did not hold up and the strip was introduced to the outside world. We researched the materials used in each test, and calculated the total price per test would be 8 cents, which was within our goal price range. This was a positive result, along with those from our usability test. During this test we showed the ability a specific person has to “urinate” on the test strip. To illustrate this action, we used a squirt water bottle to shoot water

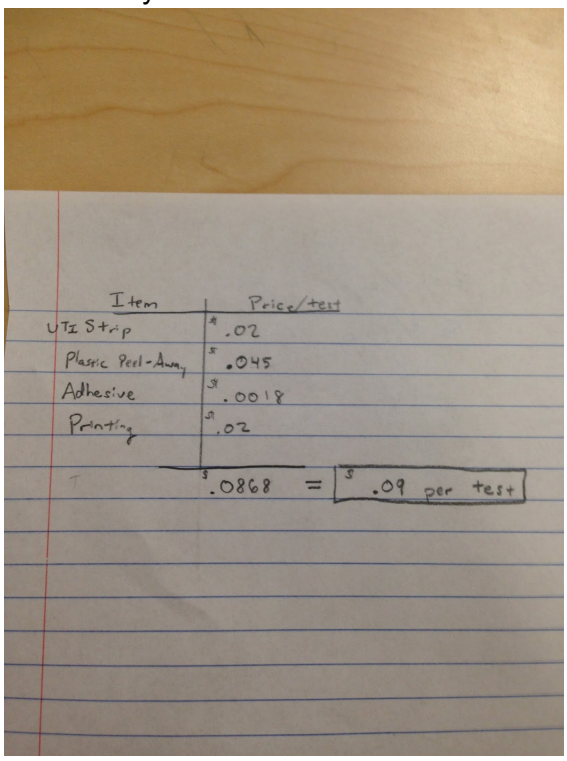
at the UTI strip, which is attached to a popsicle stick that the volunteer is holding. It is attached with a strong adhesive, that allows the test strip to stay on the stick, regardless of its surrounding conditions. Overall, it was easy to hit the strip with the water bottle. Finally, we saw that the test was an appropriate size to carry on one's person.

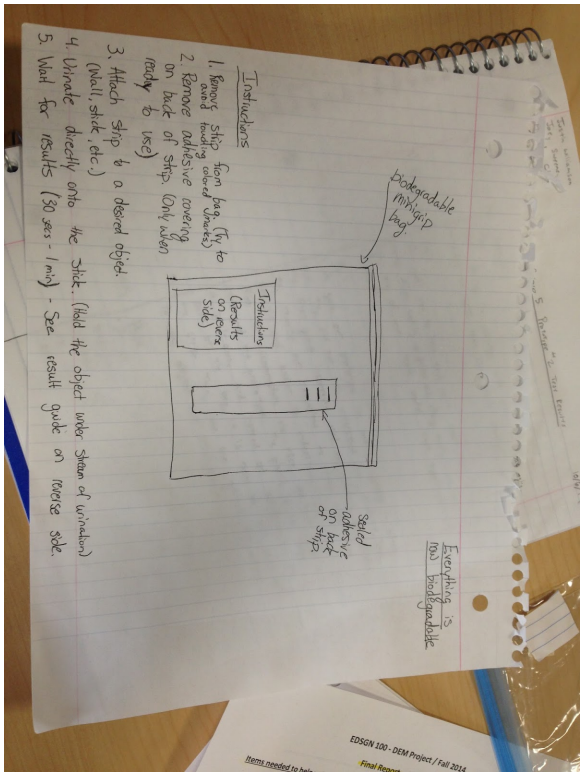
Prototype #1 Resign

After completing the tests on Prototype #1, we learned some things that need to be changed for Prototype #2. In the next prototype, we will add an example of what the positive test strip looks like. After the UTI test, the results can be compared with the example results. In the next prototype, text instructions will be printed on packaging and the strip will be placed in a better sealed packaging, to prevent the strip from being contaminated. For the next prototype, we will include an important test that we left out of the first prototype. We must test to see if all the materials are biodegradable. To do so, we must see how "green" or sustainable the test components are. Also, we must research how fast the plastic and paper decompose. The biggest change we are making in the next prototype is eliminating all wood from the design. Instead, we will attached the strip to the inside of a peel away plastic covering.

Table 2: Prototype #2 Testing

Test	Result/Explanation
Protection Figure 8: Water poured on the packaging to test its protection. 10/6/14, 8:18 AM, 3rd Floor Hammond	Pass After dousing the prototype with water, the packaging protected the UTI test strip inside from getting wet.

Hallway	
Affordability  Figure 9: Calculating Price Per Test 10/6/14, 9:23 AM, 316 Hammond	Pass Our goal was to have each test cost less than 10 cents. After looking up prices and doing the calculations, we found each one of our tests, including the strip and the other materials, would cost approximately 9 cents.
Simplicity Figure 10: Students trying to use the prototype 10/6/14, 8:12 AM, 316 Hammond	Fail We gave our prototype to another group in class, and they did not fully understand our product. Since the first group incorrectly used our product, we decided to rewrite our instructions to make them more specific and easier to understand. Also to accommodate the user, we have slightly redesigned the prototype. The plastic is no longer a peel-away and instead of adhesive on the back of the bag, it is now on the back of the strip. Then, you can attach the strip to any object (wall, stick, etc.).
Eco-friendly	Pass All of the materials used in our design are biodegradable. The only item in question is the plastic. However, using the MiniGrip

 Figure 11: Researching the biodegradable materials 10/6/14, 9:00, 316 Hammond	brand plastic would allow us to have a truly biodegradable and eco-friendly plastic.
Usability Figure 12: Russ attempting to hit the test strip with the squirt bottle 10/6/14, 9:36 AM, 316 Hammond	Pass For this test, we used a squirt water bottle to determine how difficult it would be to hit the test strip. After testing it out, we were all able to hit the UTI strip with ease, and as a result we deduced it would be equally as easy to hit the UTI strip while urinating.

Prototype #2 Observation Summary:

The testing of prototype #2 went better than expected. The main idea we learned while testing prototype #2 was that the design could be be more simple, and still be just as effective

and accurate. Getting rid of most of our design materials from prototype #1 helped us cut costs when we transitioned to prototype #2. We believe that the prototype is close to or now at its simplest form. There were no big surprises in the testing, other than the fail in the test of simplicity. The prototype will be redesigned because of this fail.

Cost Analysis:

User Guides:

Instructions:

1. Remove test strip from mini-grip bag.
2. Remove paper covering from adhesive strip on back of UTI test strip.
3. Attach UTI test strip to desired object via adhesive strip. (Stick, wall, etc.)
4. Urinate directly on to the strip, hitting the colored markers as frequently as possible.
5. Check results after 30 seconds-1 minute (See result guide)

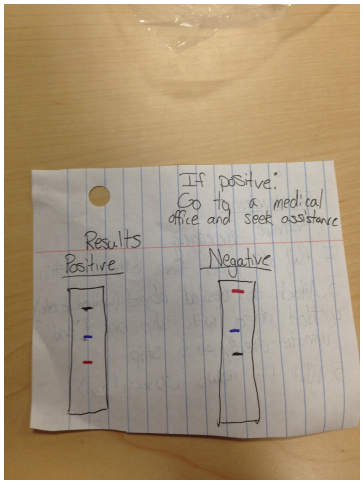


Figure 13: Example of the UTI test strip results
8/6/14, 9:30 AM, 316 Hammond

Disposal:
All materials are biodegradable, so there are a couple of options.
-Bury underground. (Soil bacteria degrades materials)
-Incineration (Fire consumes all materials and ash can be used n soil.)
-Compost in a garden (Soil bacteria degrades materials)

Re-design ideas for prototype #2:

If our group was designing a third prototype, we would change some features. Firstly, we would get rid of the adhesive on the back of the design, and instead put it on the back of the test strip. This way, the user can peel the test strip off of the plastic and attach it to any

item (stick, wall, etc.) Also, we decided to make some changes after the presentations on Tuesday. During the event, we talked to one of the HESE students who actually lived in Cameroon for two years. He suggested that we use some material that can be locally found in the country, like a thin plastic that is fully biodegradable. Also, he explained a glue that is made out of a crushed nut blend. This could be a substitute for our adhesive. After making these changes, our design stays 100% biodegradable, while using materials readily available in Cameroon.

Cost Analysis

According to the news, current minimum wage of Cameroon is 36,270 FCFA per month which is about 71 USD. Our minimum price for prototype number two is approximately 9 cents. Since test strip would not be used daily, the price for our prototype will be affordable for the current minimum wage in Cameroon.

"According to authorised sources at the Ministry of Labour and Social Security, the minimum wage will be raised from 28,000 FCFA to 36,270 FCFA, which is an increase of 8,000 FCFA. Parties on both sides have suggested that all that is left to make it official is regulatory action."
Source: http://www.bananalink.org.uk/cameroon-increase-minimum-wage-0