wintervention

vasilisa semouchkina | annie chen | kaylla cantilina


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WH
A.P.C

EXECUTIVE SUMMARY

This past semester has been an incredibly rewarding and enlightening experience for all three of us. We're so excited about the progress that our team has made over the past couple of weeks, and we're proud to present the culmination of our semester's work: *Wintervention*, a proactive way to fight the cold. For the past couple of weeks, we've had the amazing opportunity to work with some of the brightest and most inspirational minds at the DCH school in Brightmoor. The relationships we've formed with these students will last beyond our once-a-week trips to Detroit, and the invaluable perspectives they've offered us have influenced us in ways we could not have possibly predicted at the beginning of the semester. In addition to these experiences with the Brightmoor students, we've also had the incredible opportunity to think deeply about the meaning of change and its relationship with design. It was through the execution of our project that we were able to begin to understand how to define change through the medium of design.

Wintervention was born from three peers' hopes to influence transportation in and around the Brightmoor community. Starting with simple activities and pre-prepared questions, we began thinking about designing a solution that would alleviate the students' commutes to school in the wintertime. From here, we created a problem statement that asked a single question: "How might we offer a locally-sourced, cost-effective, and sustainable solution for the arduous winter commutes of Brightmoor students?" As an answer to this problem statement, we presented a solution that was as creative as it was practical: "By encouraging innovation and motivation through the creation of rechargeable heating pads from basic materials, to be utilized by students on their commutes to school." Our solution incorporates the building of rechargeable heating pads by teaching basic skills (such as sewing and soldering), as well as focusing on sustainability and creativity. With the diversity of skillsets and experiences within our team, we were confident that we would be able to execute our solution, while also keeping the students engaged and excited. Throughout the semester, our team learned how to sew pouches for their heating pads as well as how to solder wire together in order to generate an electric current. This past Thursday, two students completed their heating pads (and yes - they work!).

What we discovered about 'change', especially with respect to working with the DCH students, was that we were not intentionally trying to 'change' anything at all. Really, we were building, creating, and innovating - and always with the students in mind. We wanted to be their mentors as well as their friends. We wanted to emphasize that we were there to build with them and help them become the entrepreneurs they were all capable of becoming. We are especially proud of what we've built with *Wintervention* because of how it was designed with the students and never for them. Thank you to all of the DCH students for your incredibly hard work this past semester; and to Nick and Elizabeth, thank you for guiding us on the journey that eventually became *Wintervention*.

CONTEXT

OBSERVATIONS LEADING TO PROBLEM IDENTIFICATION

During the 2013-2014 season, Detroit had record-breaking snowfall of 94.9 inches, more than DOUBLE their average seasonal snowfall. With this amount of snowfall, many Detroit citizens take to walking rather than driving to their respective destinations. For students trying to get to school on a daily basis, this is a huge problem. Looking to document and understand how these other students at DCH commute to and from school, we utilized a satellite image of the Brightmoor school and the surrounding neighborhood. The students then documented how they commuted to school by drawing out their routes -- from there, we consolidated these routes and turned it into a "circulation map". Along with the commutes of the students, we also noted places and landmarks of interest. What we found was that most of the DCH students do not live anywhere near the school and often must take a significant amount of time to get to school. These commutes are made even longer and colder in the winter.

ROOT CAUSES OF PROBLEM IDENTIFIED

Though winter weather was the ultimate root cause of circulation impediment, issues like long arduous bus routes, lack of city infrastructure, carpooling, and socioeconomic status all come to play when discussion the difficulties of coming to school. We decided to address winter weather specifically, because the other factors named were circumstantial in relativity to each student, while weather affects everyone.

RESEARCH FROM 5 LEVERS OF SOCIAL CHANGE

1st Lever: 'Bright Spots'

We read this lever as advising our idea to act as a leading light, of sorts, for future, replicable organizations who aim to solve the same problem. On the note of replicable initiatives (bright spots), it is important to keep in mind that we should try to synthesize a solution that is sustainable. A good example would be Thrive Detroit, which is a company that helps homeless people start micro-entrepreneurial projects. The model of helping disadvantaged people through starting businesses is not new, but it is easily replicable -- i.e. our business model of "for-profit with a social arm".

2nd Lever: 'Utilizing Data and Research'

Hurst is right in stating that data is VERY important for anybody to embark on a mission of social change. Our first step, before we began working on our problem statement, was to think about research - especially because we are foreigners with respect to the students in Brightmoor. We utilized maps to draw out routes, mark important locations, as well as questions to help us understand further what was the root of the transportation and circulation issue for these students. From there, we were able to gather data and begin to formulate a possible solution.

A great example of this lever is "Place-It", which uses art and design models to help engage the public in urban planning. The hands-on approach is very valuable, especially with regards to the fact that we are working with students who may not be completely comfortable with writing out their thoughts.

3rd Lever: 'Change Through Public Perception'

This is, in our opinion, the most interesting lever of the five. Hurst provided a great example with the Meth Project TV spots. We think some of the questions he asks with regards to this lever are interesting as well - how can we leverage our solution to this issue so that it will be widely adopted by every student in the school? We could offer twenty solutions, but if these solutions do not appeal to the community, they are essentially - created blindly and with no end goal in sight.

4th Lever: 'Change Through Shifts in Policy'

This is a lever that would be interesting in the long-term. Our solution of rechargeable heating pads are a short-term solution for a long-term issue that cannot possibly be solved today or tomorrow. However, we agree that oftentimes, policy shifts take the longest time to execute because of all the red tape and bureaucracy that exists in the political landscape. Gathering political efficacy in a community is the first step towards making political change happen. An interesting group and a very good example of this is called Neighborhoods Working in Partnership: Youth Mobilizing for Political Change which is a project that teaches students advocacy skills and policy making, aiding them in being a voice for their communities.

5th Lever: 'Disruptive Technology'

Especially in our generation, we need to utilize technology to approach any kind of problem. Disruptive technology does not have to be expensive either. For example, our solution incorporates the idea of creating rechargeable heating pads that can be kept in pockets – for commuting in the winter. A heating pad requires a metal core, a battery pack, and a protective covering. This would be disruptive technology and would cost no more than $5 to make. To think about the impact such a product could have on the students who walk long distances just to get to school, however - is priceless.

NEXT BEST ALTERNATIVES / NEAR PEERS / ASPIRATIONAL ALLIES

Our next best alternatives include disposable heating pads that can be purchased at drug stores, but they are not reusable and therefore not a very valid alternative for our product. Other alternatives include USB-chargeable mittens, which are similar in design to our own - however, they do not teach the transferrable skills that we offer with Wintervention. Near peers include winter-clothing companies (i.e. Canada Goose, The North Face); these companies utilize marketing and advertising to emphasize that winter can be defeated by, presumably, wearing their clothing. We aspire to utilize similar marketing techniques for our own product and design. In the future, we hope to partner with online retail sites based in Detroit (or elsewhere) who would be willing to feature our product on their sites, in addition to local storefronts who would be willing to stock our products in their stores as well.

BRANDING

LOGO & BRANDING

The final logo was crafted with the idea of resilience in the face of winter in mind. The penguin stood as an animal warm and thriving in a hostile winter environment. However, a penguin alone left our concept too ambiguous. As a result, the flame was incorporated into the penguin's belly, a representation of 'heat from within'. The flame burned, in an unusual but shapely coordination with the penguin, to represent a sort-of artificial heat generated and given to a natural animal. The combination of the two elements went together harmoniously to symbolize *Wintervention*'s concept.

MARKETING AND DIFFUSION STRATEGY SUMMARY

We'd like to break down our marketing strategy into the 4P's – which are Product, Place, Price, and Promotion. To start with, we have a fantastic brand that will help our product appeal to a wide audience. Our product is unique in that we formulated a solution from a problem that touched many students at DCH. It is also unique in that it utilizes cheap materials and is rechargeable using a USB cord. This leads to price: our price point will be very low as well as reusable – characteristics that separate us from heat pads that are thrown away after single usage. These one-time heating pads may be offered at a cheap price point as well, but the reusability of our product as well as its lower price point will help our product appeal to a wide audience. With respect to promotion, we would like to emphasize that we are locally sourced and built with the help of Detroit students. As mentioned in a previous post, viral marketing would definitely help our product be promoted further, and we could also utilize local media to help promote our product as well. The ideal starting, selling location of our product would be in DCH to other students at the school. We would then move into the nearby community with the help of word-of-mouth as well as in-the-field selling. If possible in the long-term, we should definitely utilize the help of the Internet by offering a simple e-commerce site where our heat pads can be purchased.

We'd also like to emphasize that a main, marketing strategy that would be invaluable for us is to combat what winter currently means to Detroit citizens. We are – essentially, a Winter Intervention. We cannot make winter disappear, so we want to have the upper hand against the winter and the cold. We want to appeal to the very core of the harshness of a Detroit winter and temper it with our solution.

<table>
<tr>
<td rowspan="2">KEY PARTNERS

Detroit Community High School in Brightmoor

Brightmoor Students

University of Michigan Students</td>
<td>KEY ACTIVITIES

Building cost-effective, locally-sourced, stainable, and rechargable heating pads with the Brightmoor students at DCH</td>
<td rowspan="2">VALUE PROPOSITION

By encouraging innovation and motivation through the creation of rechargable heating pads from basic materials, to be utilized by students on their commutes to school.</td>
<td>CUSTOMER RELATIONSHIPS

For now, person to person customer service

Emphasize community

Volunteers to help with repair/service of product.</td>
<td rowspan="2">CUSTOMER SEGMENTS

Students at Brightmoor's Detroit Community School

Brightmoor Community

Greater Detroit Community

Eventually, the entire country!</td>
</tr>
<tr>
<td>KEY RESOURCES

Carbon Fiber Strip
Silver Glue & Wire
Button Switch
Thermostat Switch
Fabric Pouch
Building Skills</td>
<td>KEY ACTIVITIES

Person-to-person, door-to-door selling

Basic e-commerce</td>
</tr>
<tr>
<td colspan="3">COST STRUCTURE

Thermostat Switch: 1/$9.73
Button Switch: 5/$2.45
Wire: 25 ft./$4.25
Nichrome Wire: 10 ft./$3
Battery Pack: $2.00
USB Cable: $0.99
Solder: 5 ft/$1.99
Marketing Costs</td>
<td colspan="2">REVENUE STREAMS

Sell each rechargable heating pad for around $8. We consider ourselves a for-profit with a social arm - meaning that we are encouraging revenues, while also being motivated by socially-oriented motives.</td>
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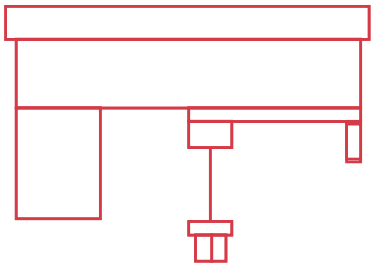
APPENDIX

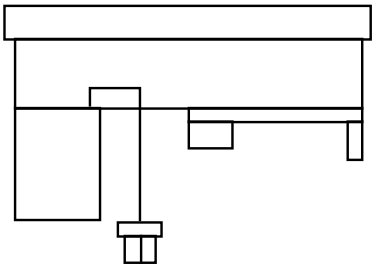
DOCUMENTATION OF PROTOTYPE STAGES

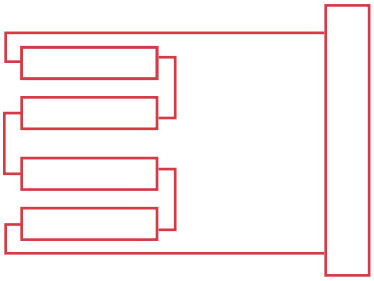
Before making decisions on an alpha and beta design, thorough review of other research and design done by others is imperative, as to not make the same mistakes someone else has already made. heated clothing is already a technology, but the materials used in commercial products are not readily available such as nichrome tape and other resistive materials. Research yielded two DIYs that were combined in the sketches below.

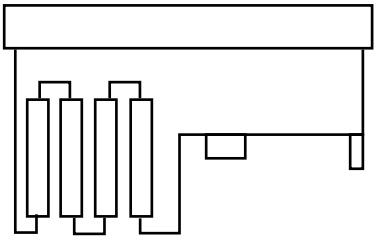
> http://www.instructables.com/id/DIY-heated-clothing/
> http://www.instructables.com/id/DIY-carbon-heated-beanie/

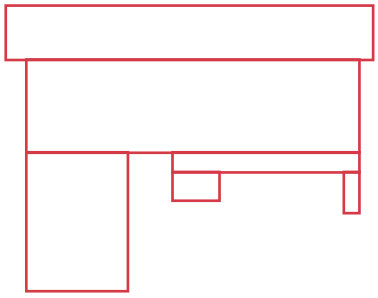
< PART 1 **PART 2 >**

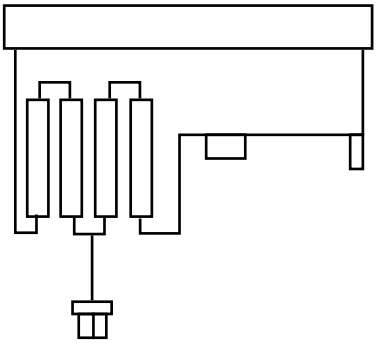


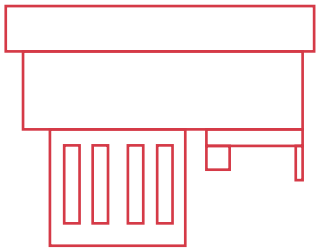




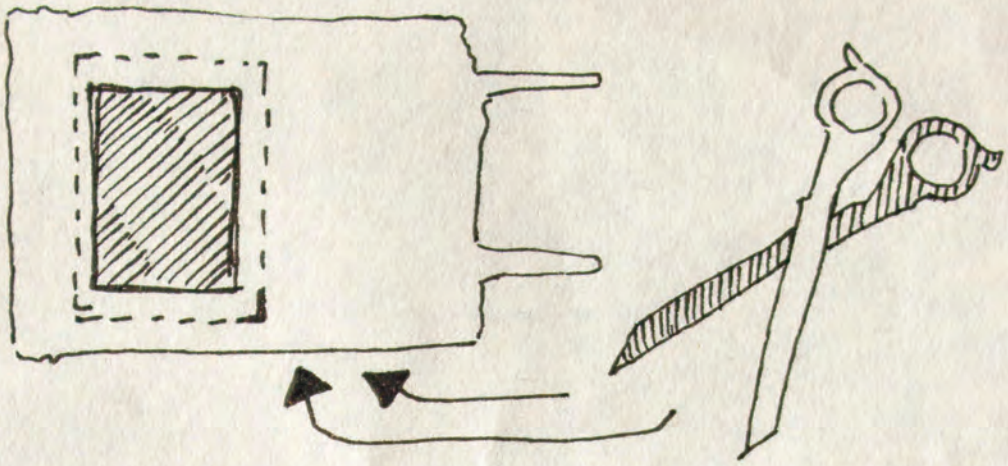




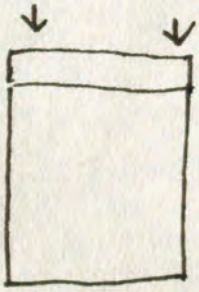




① PUT BLACK SQUARE ON FABRIC ⅓ TRACE! CUT TWO OF THE SHAPES OUT

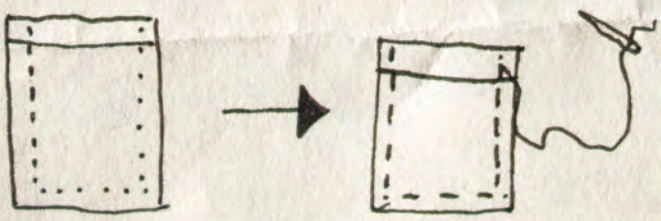


② LINE THE FABRIC SQUARES UP. FOLD DOWN THE TOP ½" ON BOTH SIDES.



* the outside part of your pouch should be facing the inside.

③ DRAW LINES AROUND THE EDGES, ALSO ½" SEW ALONG THESE TO THE TOP.



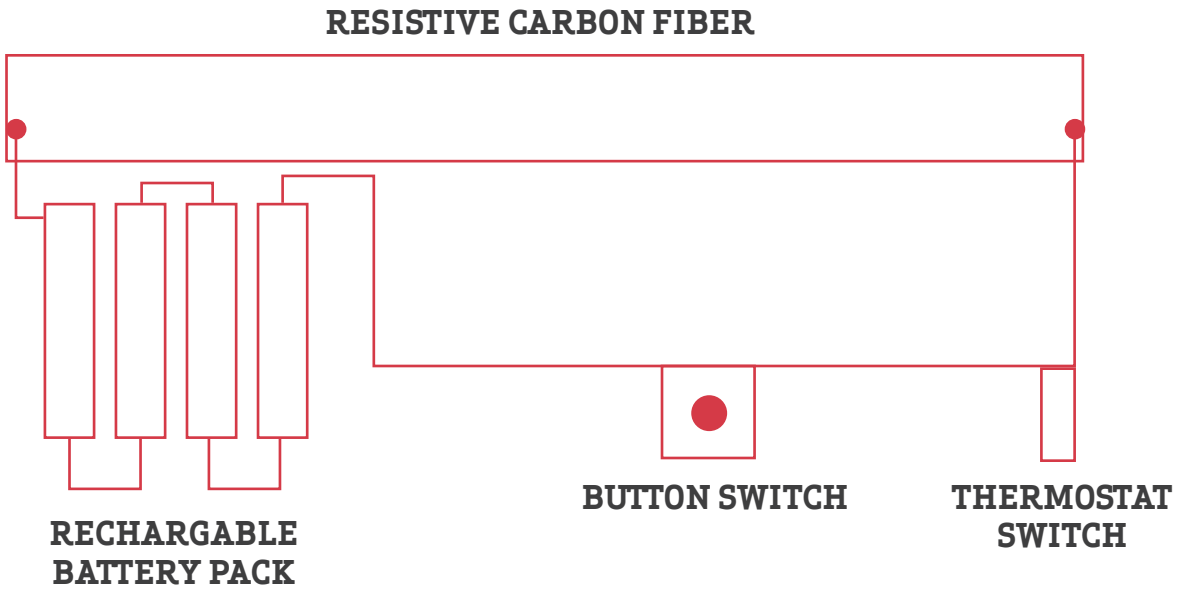
* sew through both sides

④ TIME TO SEW YOUR FLAPS! SEW THROUGH ONE SIDE AT A TIME ONLY!

ONE SIDE AT A TIME!

ALPHA DESIGN

Design C from the sketches above became the original Alpha design, consisting of resistive carbon fiber tape, rechargeable battery packs comprised of AA batteries, a button switch, and thermostat switch for safe temperature regulation. Carbon tape distributes heat better than Nichrome wire, and AA batteries are safer than lithium ion batteries used in the DIY links previously mentioned. The switches were both integrated as safety measures. Eventually this design would evolve into the final prototype, due to difficulties with making a strong circuit connection on the carbon tape.

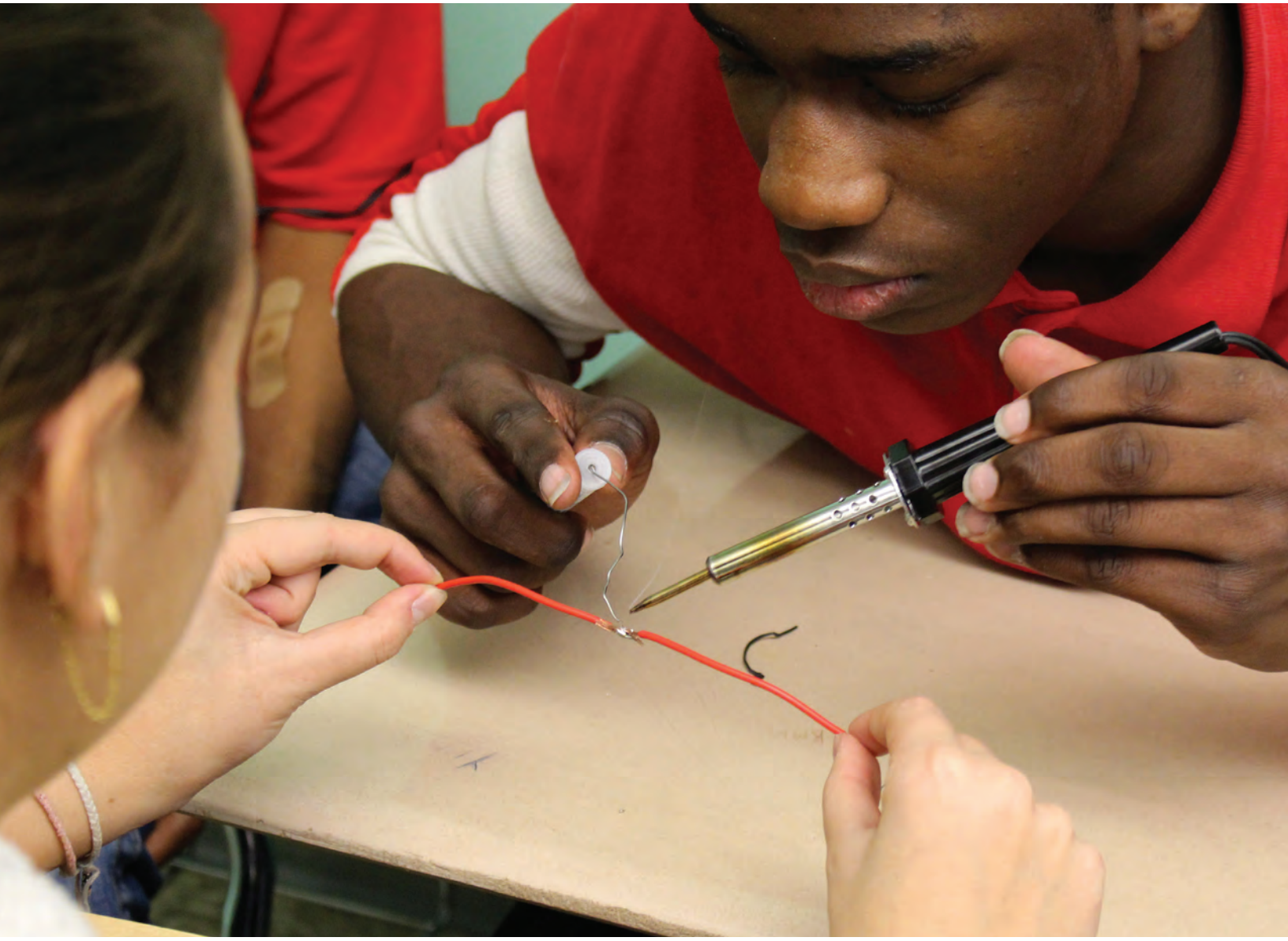


DESIGNING AT DETROIT COMMUNITY

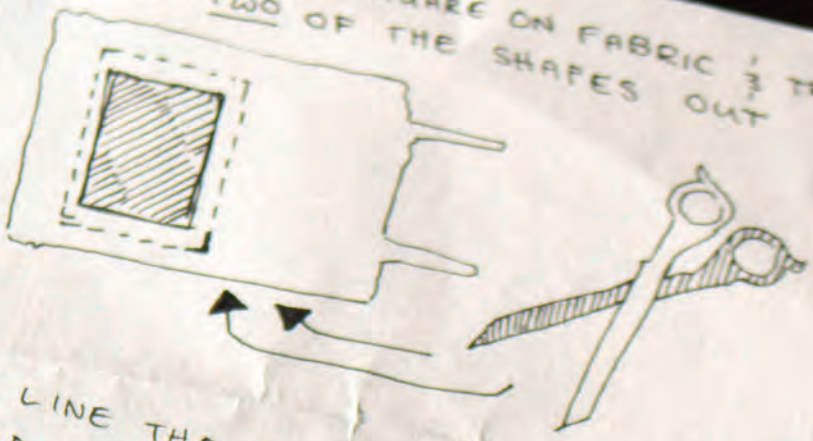
While refining the product's design, the simultaneous goal of *Wintervention* was to empower students through teaching them technical skills that would aid them in changing their environment through design.

We began this process by teaching the students to solder, read circuit maps, and understand the basic principles of electronic circuitry. To do this, we constructed a mini project based on electromagnets, which is a simple device that magnetizes a wire wrapped bolt when an electric charge flows through it. By mastering soldering, students also connected buttons to the device which turned the electromagnets on and off.

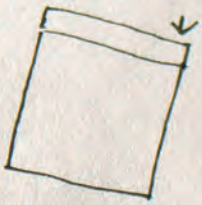
We continued to work with our partners in Detroit by showing them the design, and moved forward by making the exterior pouch of the device through teaching them sewing skills. The pouches are made from upcycles t-shirts sewn together with a basic stitch and hem.



① PUT BLACK SQUARE ON FABRIC & TRACE! CUT TWO OF THE SHAPES OUT

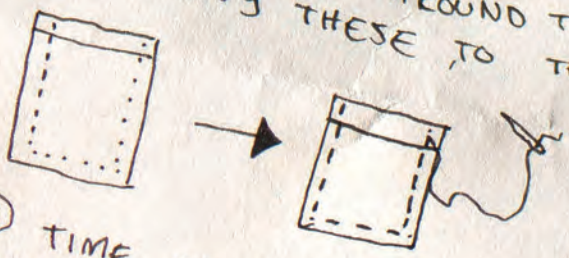


② LINE THE FABRIC SQUARES UP. FOLD DOWN THE TOP 1/2" ON BOTH SIDES.



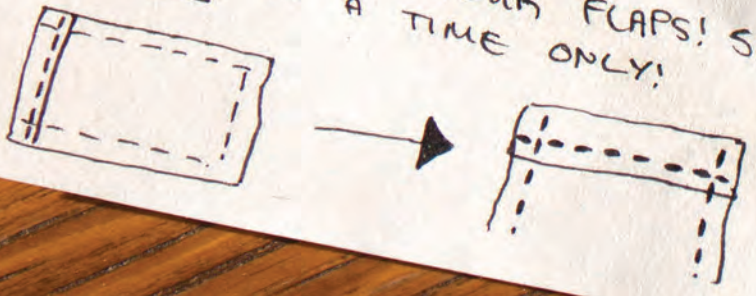
* the outside part of your pouch should be facing the inside.

③ DRAW LINES AROUND THE EDGES, ALSO 1/2" SEW ALONG THESE, TO THE TOP.



* sew through both sides

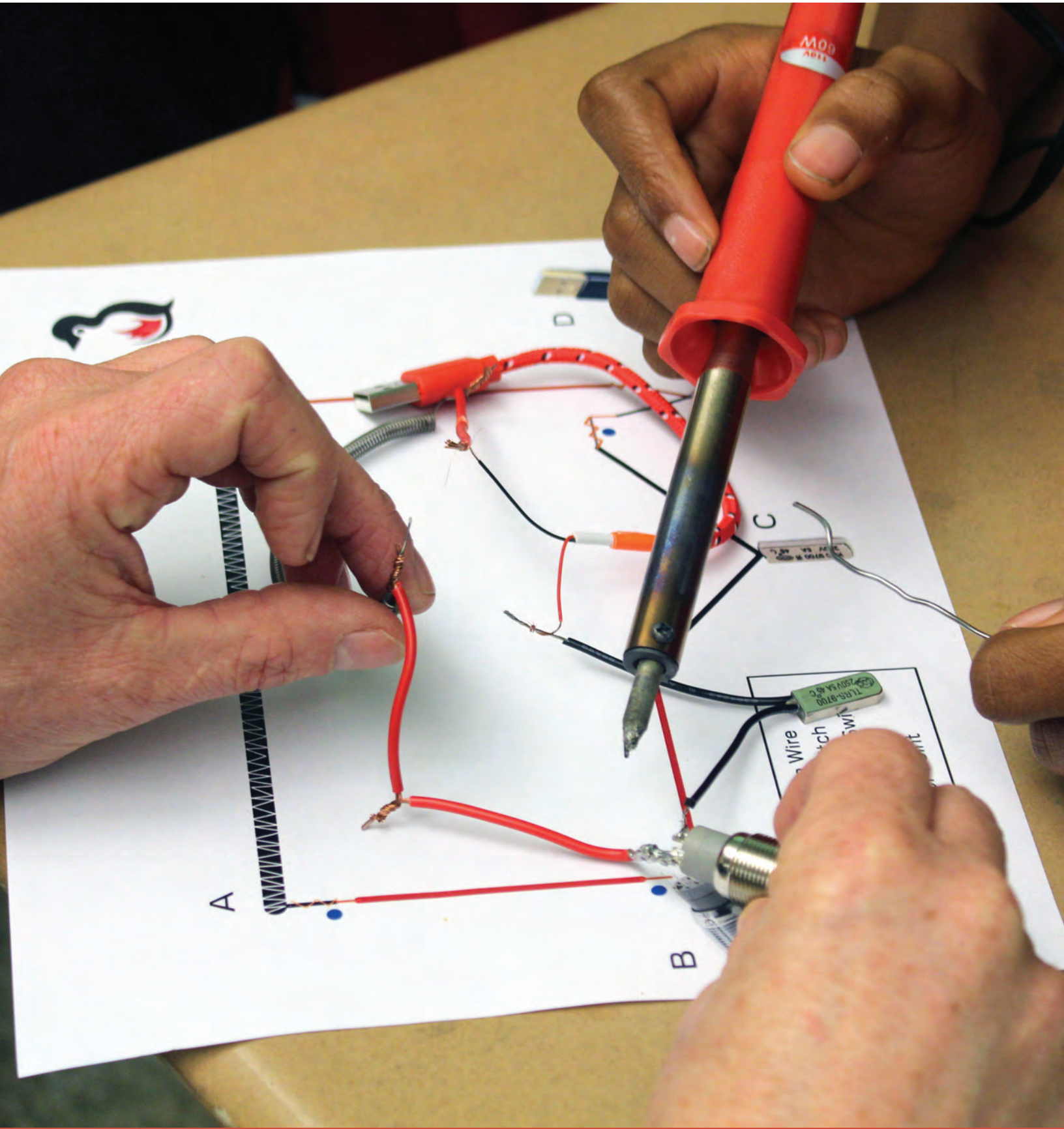
④ TIME TO SEW YOUR FLAPS! SEW THROUGH ONE SIDE AT A TIME ONLY!



ONE SIDE AT A TIME!

CONFIRMING A DESIGN

The final prototype of the product was redesigned to use nichrome wire recycled from the inside of a hairdryer because of its ability to be soldered directly to copper wire unlike the carbon tape. the circuit map to the right shows the sewing and solder points of the design, as well as its arrangement on the fabric.



INSTRUCTIONS

Materials

> Two 3.5 inch peices of copper wire
> 45 degrees Celcius Thermostat Switch
> USB cord
> 6 inches of Nichrome Wire
> Button Switch
> Solder/Flux
> Soldering Iron
> Multimeter

Two types of pre solding connection are made in the project, the hook and the twist.

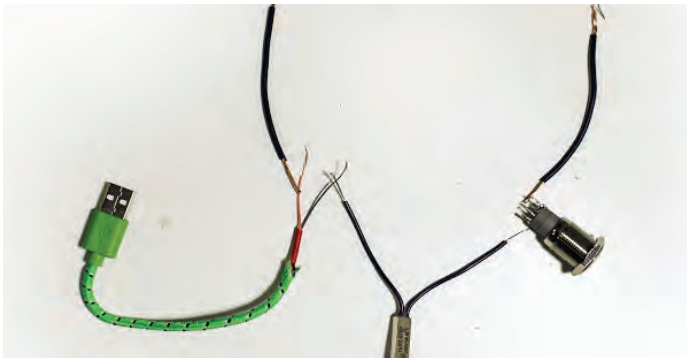
Hook: Take one stripped end of each of the two wires you want to join, and bend them inwards. Before they fold all the way, hook them into each other at the kink.

Twist: Take one stripped end of each of the two wires you want to join, and stack them pointing towards each other. Twist together.

INSTRUCTIONS

1. Strip the ends of all insulated wires (copper wire, thermostat switch, USB cord)

2. Lay all the materials in this lay out in preparation of where you will solder the wires together. The circuit should be as shown.



3. Twist the nichrome wire to one piece of the copper wire. To solder the connection, heat the wires with the tip of the soldering iron. When it is hot, melt some of the flux onto the twisted wires to solidify its bind.

INSTRUCTIONS

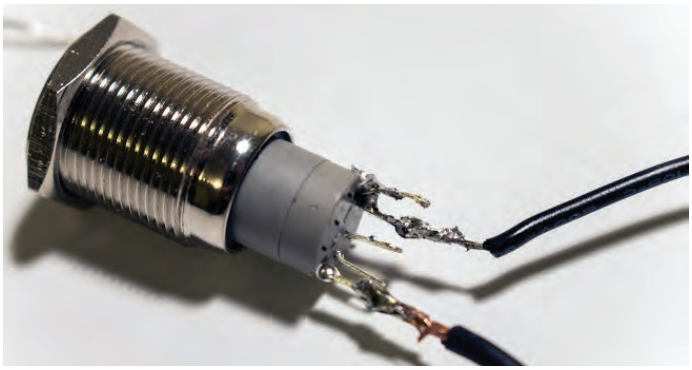
4. At the other end of the nichrome wire, do the same exact thing.

5. Take the other end of one of the copper wires and feed it through a small hole in the prong at the bottom of the button switch. make a hook connection around the prong and solder the connection.

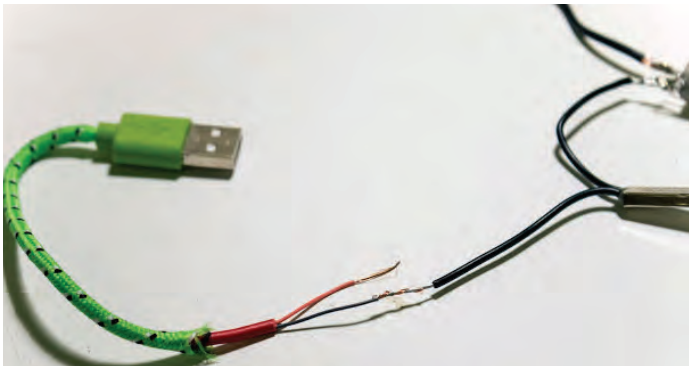
6. Now that there are several connects, use the multimeter to test if the connections are strong and will carry a current. Put one tip of the multimeter on one end of your circuit, and another top at the other end. If the needle on the multimeter moves, the conncetions are good. If it does not, check for loose solder or wires.

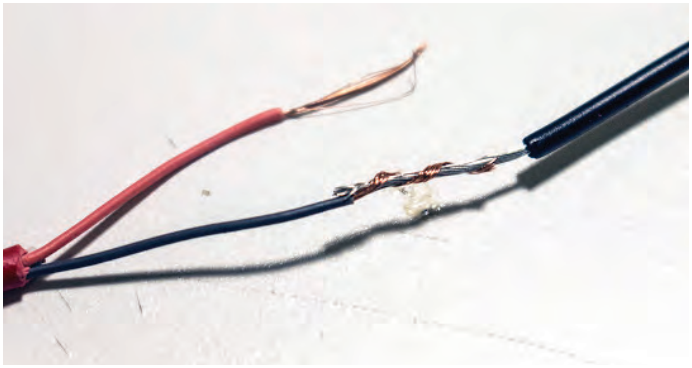
INSTRUCTIONS

7. Feed one end of the thermostat switch into another prong of the button switch. Make a hook connection and solder it.

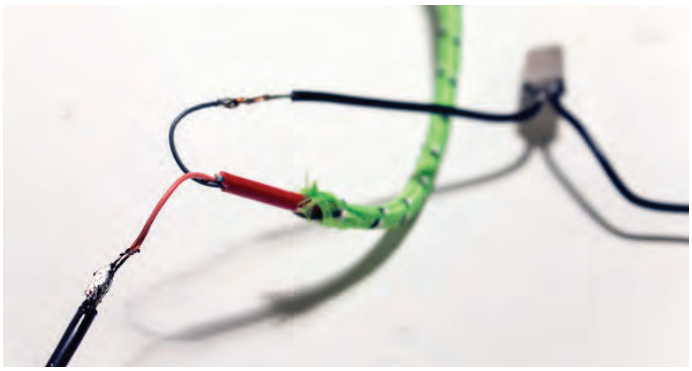


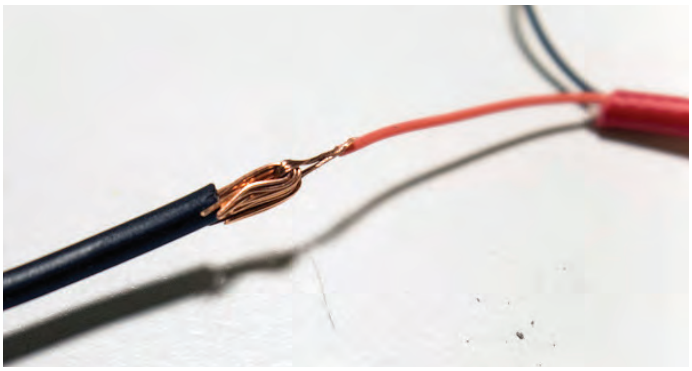
8. The USB cord has two wires coming out of it. Take the black end and make a twist around the other end of the thermostat switch. Solder it together.





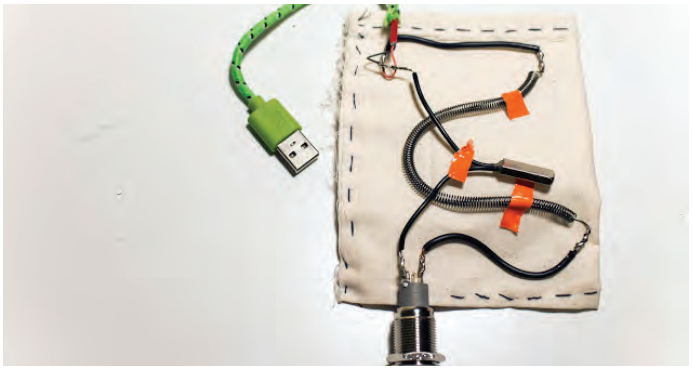
9. One of the copper wires should have nothing connected to it but one end of the nichrome wire. Take the other end and twist it around the red wire sticking out from the USB chord. solder those two wires together to complete the connection.





INSTRUCTIONS

10. Tape the complete circuit onto the fabric pouch as shown, and sew where the tape is placed to keep the device in place inside the fabric.



11. connect it to power!