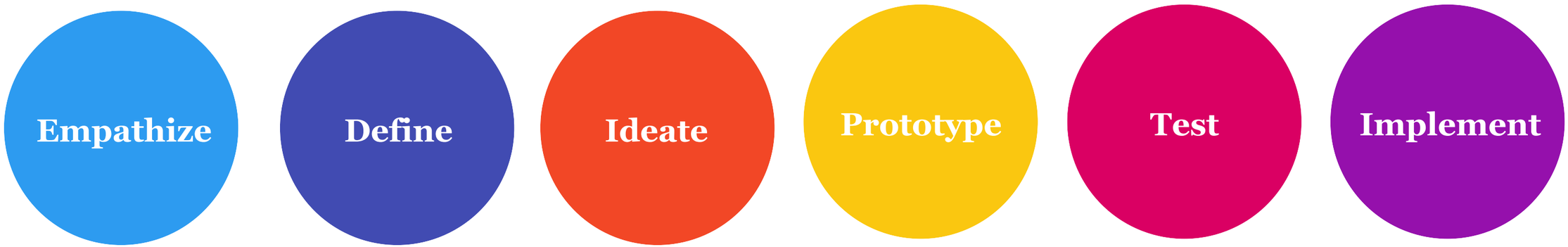
JASMINE TREE

Waterproof Running Shoe Cover

DESIGN THINKING STEPS:



These steps correlate to the top right hand corner of each page.

Calendar

Kanban

Sunday | 4	Monday | 4	Tuesday | 4	Wednesday | 4	Thursday | 4	Friday | 4	Saturday | 4
Start Project Mar 20	Mar 21	Mar 22	Finish Selecting Brief Mar 23	Mar 24	Mar 25	Mar 26
Mar 27	Mar 28	Mar 29	Get Research Completed Mar 30	Mar 31	Apr 01	Apr 02
Apr 03	Apr 04	Apr 05	Prototype 1 Finished Apr 06	Apr 07	User Testing Finished Apr 08	Apr 09
Apr 10	Prototype 2 Finished Apr 11	Apr 12	User Testing Finished Apr 13	Apr 14	Finalize Thoughts Apr 15	Project Due Apr 16

Quick Beginning Summary of Project Idea:

I chose to do my project on making a waterproof running shoe cover. I originally came up with the idea because I wear running shoes everywhere I go and whenever it rains they get soaked as I bike or walk to campus and it is really annoying. However, for this project, I am going to focus on making a waterproof running shoe cover that specifically benefits runners.

EMPATHIZE: Interview (20 Min)

Findings (notes):

- Wants something that will keep her shoes waterproof while she is out running in the rain.
- Doesn't want the cover to impact her run/ the way her running shoes perform.
- Wants something that is durable.
- Wants something that is reusable.
- Wants something that is easy to use.
- Either wants the cover to be clear so she can still see her cool shoes or the cover could have its own design on it. Either way she just doesn't want it to be ugly.
- Doesn't want it to be bulky.
- Wants it to be lightweight.

Why?:

I chose to use the interview method because it will help me speak directly to a runner and know how to best create a product for a runner. By interviewing a runner who was interested in having a waterproof shoe cover, I was able to learn a little bit about running mechanics, as well as she was able to clearly define what kind of running shoe cover she wanted. Having a face-to-face interview in this way was a very effective step because it gave me constraints to use when designing the shoe cover and things to keep in mind as I go throughout the design process. If I were to do it again I would've probably done more research about running shoe covers before interviewing.

EMPATHIZE: Researching existing products - Google and Amazon (20 Min)

Results:

Nylon reusable bag shoe covers:
I think this would be easy to use but it is ugly and bulky.

Silicone bag shoe cover with zipper:
I really like this, it seems like this would be easy to use. I am wondering how fitted the bag is to your foot and if it would be bulky.

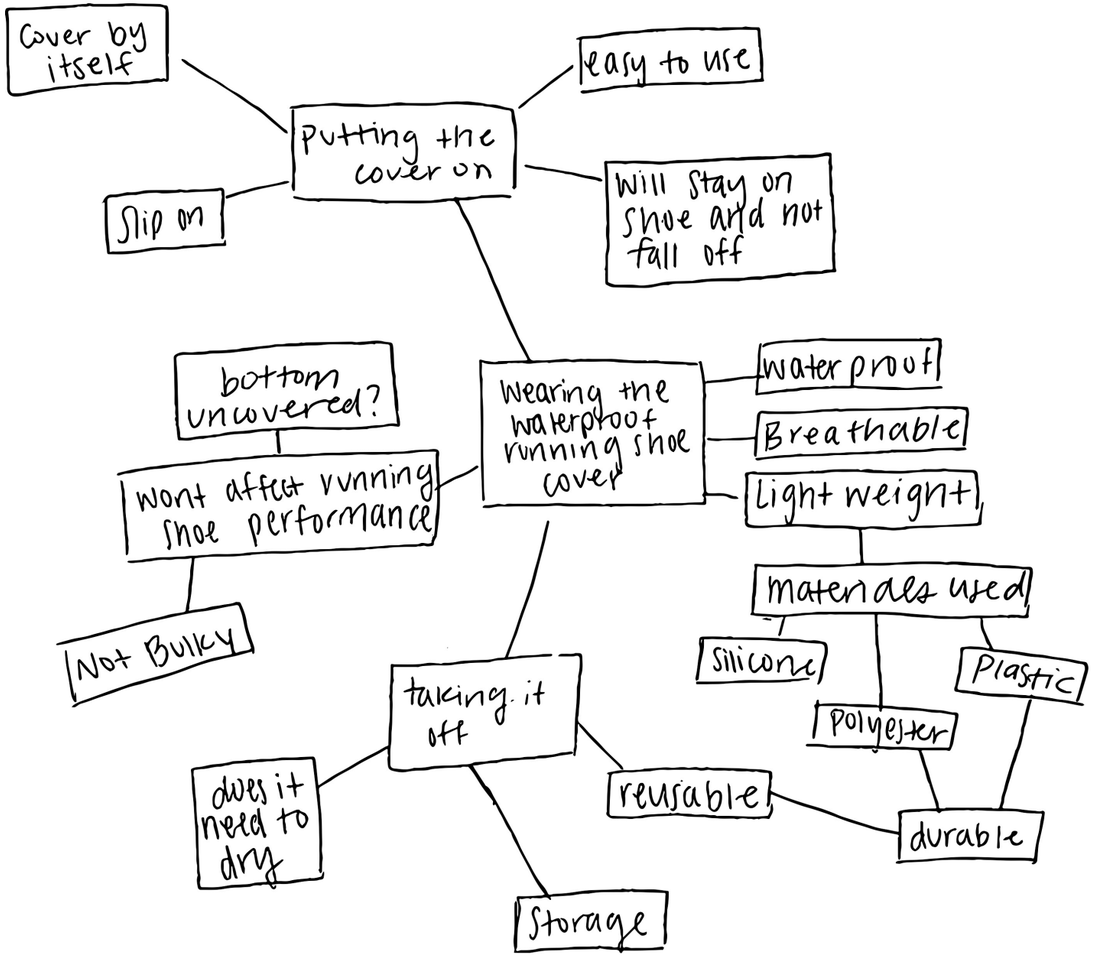
Silicone waterproof shoe cover:
I like the see through factor and it looks very fitted to your shoe. Reviews say it breaks after one use or if you step on a rock or twig.

Why?:

Researching existing products was able to help me see what is already out there and it helped me see which ones were more affective than others. I also read reviews on the products and it reinforced the idea to leave the bottom of the shoe uncovered so that the product doesn't rip when someone steps on something sharp. I felt like this method of research was very effective for me because it helped me see flaws of other products. If I were to do it again, I would've done more research in the beginning of this project.

DEFINE - Journey Map (15 Min)

Results:



Why?:

Using this method helped me find the main themes and commonalities of things that are in a waterproof shoe cover. This helped me to group important themes together, which is why I chose this method. I felt like it was somewhat effective, and if I were to do it again, I probably would've gone more in depth into the journey map.

DEFINE - HMW Statement

Attempt:
HMW build a waterproof running shoe cover that is easy to use.

Attempt:
HMW construct a reusable waterproof running shoe cover that is durable and breathable.

HMW construct a durable, easy to use, breathable, and waterproof running shoe cover that doesn't affect the way running shoes perform.

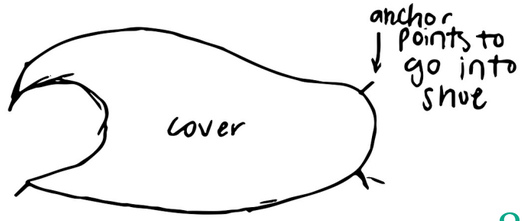
Why?:
Creating a HMW Statement helped me to define the problem/ product that I want to design as well as it keeps within the constraints set by the desires of the runner I interviewed. The main aspects that I want to focus on this project is to create a durable waterproof running shoe cover that doesn't affect the way that running shoes perform. This was really effective at helping me put my problem to solve into words.

IDEATE - Sketch (30 Min)

Why?:
I felt like sketching ideas for this design would best help me come up with as many creative ideas as possible. This method was very helpful and successful. If I were to do it over again, I would've done more research before and sketched a few more different ideas.
The numbers next to each sketch correlate with the sticky notes in the 2x2 matrix.

1

2



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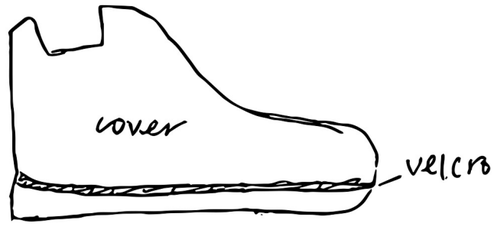

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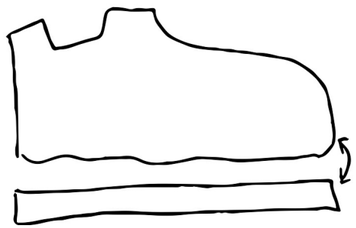

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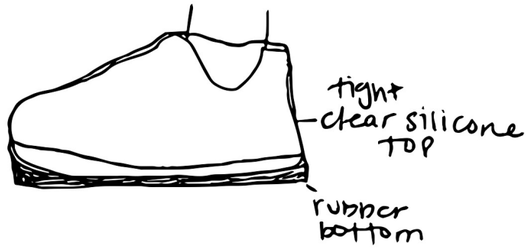

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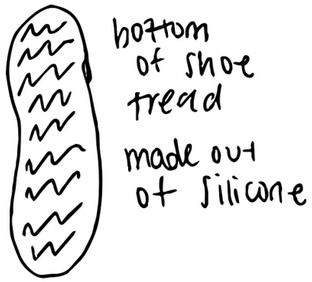

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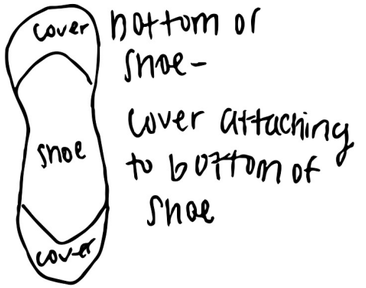

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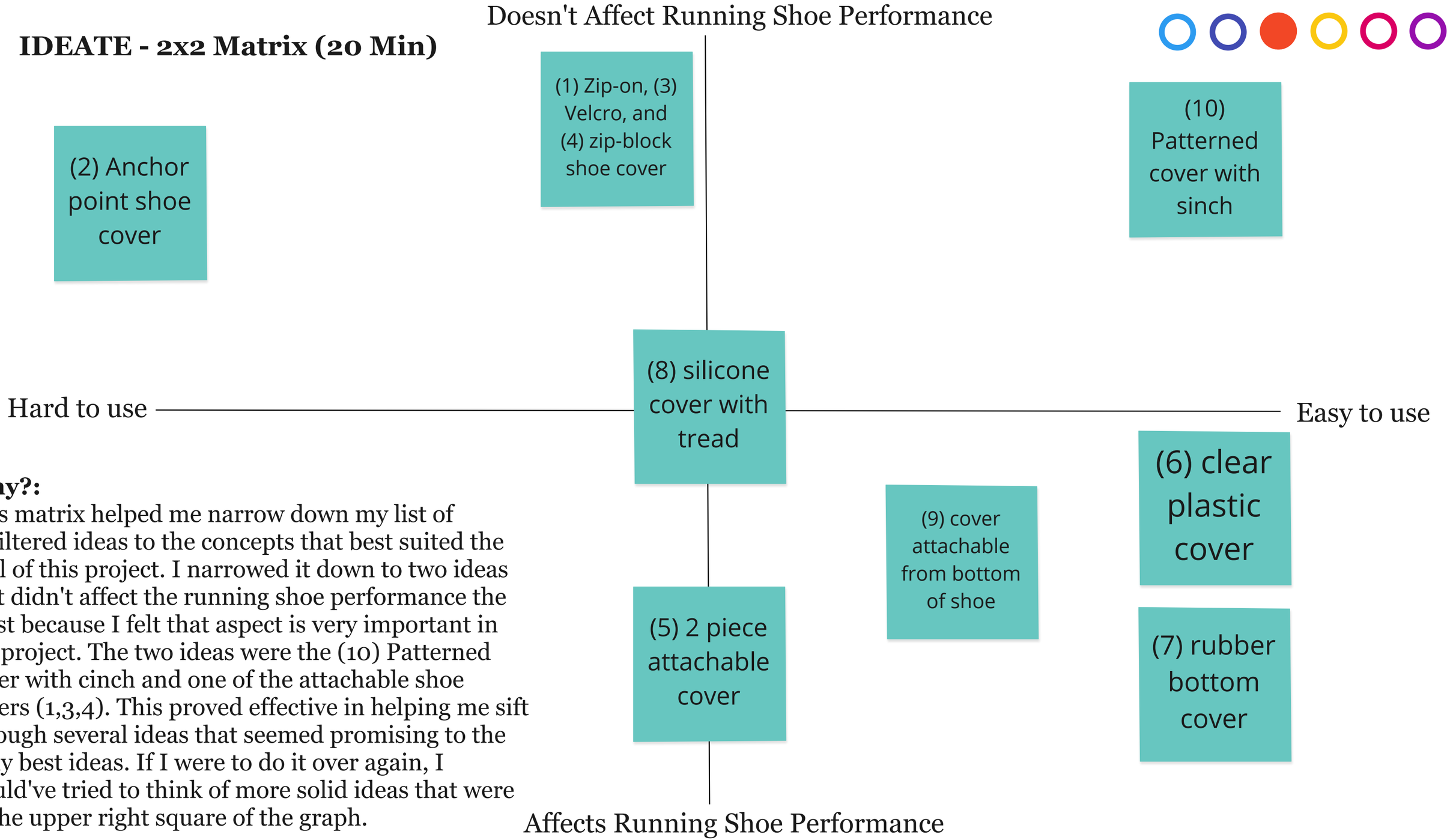
IDEATE - 2x2 Matrix (20 Min)

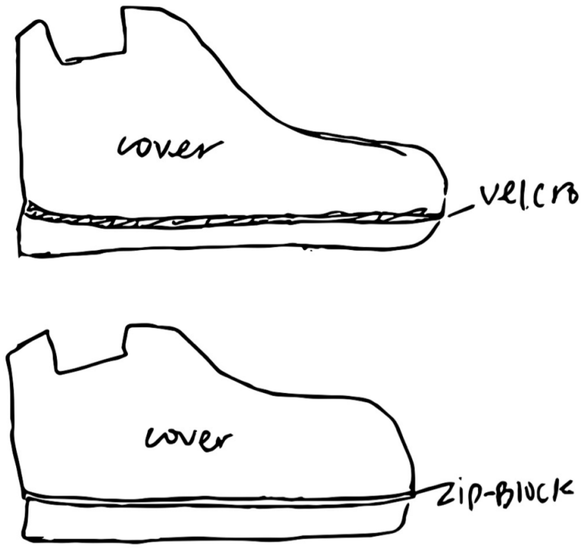


Why?:
This matrix helped me narrow down my list of unfiltered ideas to the concepts that best suited the goal of this project. I narrowed it down to two ideas that didn't affect the running shoe performance the most because I felt that aspect is very important in my project. The two ideas were the (10) Patterned cover with cinch and one of the attachable shoe covers (1,3,4). This proved effective in helping me sift through several ideas that seemed promising to the truly best ideas. If I were to do it over again, I would've tried to think of more solid ideas that were in the upper right square of the graph.

DECIDE

Design #1

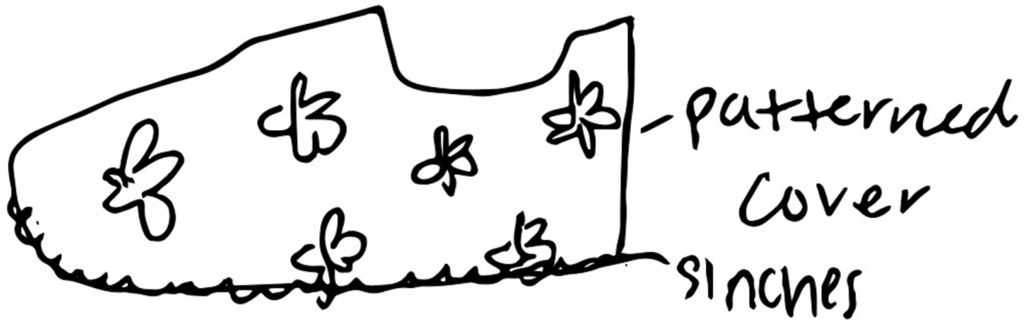
Attachable Clear Silicone Waterproof Running Shoe Cover



Why?:
I thought that this was a very original idea that would be waterproof and not affect running performance since it leaves the bottom of the running shoe uncovered. However a challenge that I can imagine coming up is that it might be hard to use at first. It would be clear and tight fitting to still see the design of your running shoe underneath.

Design #2

Patterend Waterproof Running Shoe Cover with Sinches



Why?:
I like the concept of this idea. It would be very easy to use and it would have a cute pattern under it. I also think that this is a very original idea. The bottom of the shoe is left uncovered as well for maximum performance. I plan to do research on waterproof and breathable fabrics.

EMPATHIZE: Researching existing products - Google and Amazon (30 Min)

Process: Performed the following internet searches on Google and Amazon: “shoe ice grips”, “silicone shoe covers”, “colorful shoe covers”.

Results:

Attachable Shoe Ice Grip:
I like how this attaches on to your shoe from the bottom. I may use this idea later and apply it to a shoe cover that attaches on the bottom of the shoe.

Clear Boot Waterproof Cover:
I like how you can see your original shoe underneath and how it is easy to use and completely waterproof. However, it covers the bottom of the shoe and so it may affect running performance.

Rainbow Silicone waterproof cover:
I like how there is a cool pattern on this cover. It looks stylish and fits tightly up against your shoe.

Plastic Waterproof Cover with zipper and rubber Bottom:
I like how this cover uses a zipper to help slide the shoe on and off easily. I like how the rubber bottom is used on the bottom, however, the bottom may affect your running.

Why?:

Doing research again helped me to further see what is out there already based on the two designs I plan on making.

DESIGN #1, PROTOTYPE 1

Velcro on Silicone Shoe Cover

Why?:
The idea would be that you would attach a strip of velcro to the outer sole of your shoe, and then slip on the clear silicone waterproof cover and attach it to the velcro. I chose to not have the silicone cover the bottom of the shoe because it may impact the way someone runs. I wanted to leave the bottom of the running shoe untouched to have the compression it was designed for. I also chose to not have the silicone cover the bottom of the shoe so that way when someone steps on a sharp object, the silicone cover won't break. I chose to make the silicone material clear so that you can still see the design of your running shoe underneath. I designed the prototype on Adobe Illustrator.

TEST METHODS

Feedback Capture
Feedback capture is a great way to get the user to use the product and collect feedback from how they use the product. This method of testing gives the tester valuable feedback on how to better improve their product. Additionally, the user being tested can offer feedback and critiques at the end of the test.

Interview
Interviews are valuable because the person being interviewed can offer valuable feedback on the project. The one interviewing asks questions to engage the user and collect data from the user's responses. This way is effective because it provided an environment for the user to share their opinions.

Why?:
For the testing phase, I decided to us the feedback capture method because it is more engaging and provides more accurate feedback than an interview style. Having the user talk through their actions provides valuable insight on how to better improve the project. Furthermore, by providing tasks for the user to complete, any faults in the design can be documented and corrected.

TEST 1 (15 Min)

Prototype 1- Velcro on Silicone Shoe Cover
Number of Subjects: 1

Key Findings:

1. Unique that it doesn't cover the bottom of the shoe and has velcro
2. Likes that it is clear to still see the design of the running shoe
3. May be complicated to know how to first set it all up and attach the velcro to your shoe
4. Velcro may not be completely waterproof
5. Will the velcro come off your shoe or is it permanent?

Changes to be Made:

1. Get rid of the velcro and figure out a different way to attach the cover to the shoe so that it will be more waterproof.

Why?:
Through this process of testing, I was able to gain insight from a potential user's experience by them looking at my design. Some things that I thought was straightforward on my prototype ended up not being as straightforward to the user. For example, figuring out how to first use the product without an explanation was hard. The user also brought up the point that velcro may not be completely waterproof. Because of this user's feedback and talking aloud experience, I was able to make improvements on my next prototype.
If I was to do this test over, I would include more direction in the user's experience. Having the user look at the waterproof shoe cover design and guess how to use the product while making comments can be very broad and sometime overwhelming for the user. In the future, I will include more direction and maybe tasks or activities for the user to perform as part of their testing experience.

DESIGN #1, PROTOTYPE 2

Waterproof Silicone Running Shoe Cover (with zipper seal)

Why?:
The idea would be that you would attach a strip of a zipper seal (the one used on plastic bags) to the outer sole of your shoe, and then slip on the clear silicone waterproof cover and attach it to the seal. I changed this from the velcro because it would be more waterproof than velcro. The same reasoning of why I didn't cover the bottom of the shoe still stands. I chose to lay out the prototype as a tech pack to highlight all the design features as well as highlight how the product would be made. I designed the prototype on Adobe Illustrator.

Jasmine Tree

Item:
Waterproof Silicone Running Shoe Cover

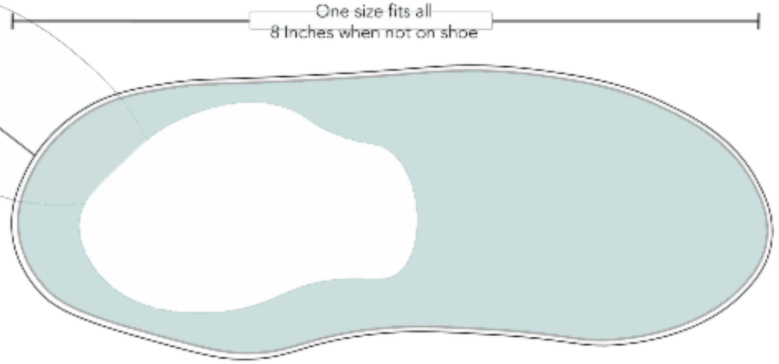
Materials:
Silicone, Ziplock Seal, Adhesive

Description:
This is a silicone shoe cover to keep running shoes waterproof. It is designed to cover the top of your shoe, while leaving the sole uncovered to provide maximum cushioning, support, and flexibility while running. This product is made out of a clear, thick, felxible silicone material. You will be able to still see your show underneath. When you put this product on, it will fit and form tightly around the shape of your shoe. Around the bottom edges of the silicone cover there will be a zipblock seal to attatch it to your shoe and therefore, make your shoes waterproof.

How to Use:
Step One - Using the adhesive side of the zipblock seal, stick the zipblock seal around the outer rim of the sole on your running shoe.
Step Two - Put on your shoe and then slip your foot/shoe through the hole on the silicone shoe cover. Fit the cover tightly around your shoe. Zipclock seal it to your shoe.

Side View Product on Shoe

Close-up of Zipper Seal



Top View Product Without Shoe

TEST 2 (15 Min)

Prototype 2- Waterproof Silicone Running Shoe Cover (with zipper seal)
Number of Subjects: 1

Key Findings:

1. Shoe rendering is very good.
2. I don't have a 3D View of the product
3. Zipper seal is more waterproof than velcro
4. May be complicated to attach to shoe and figure out how to use
5. How permanent and secure is the shoe cover on the shoe?

Changes to be Made:

1. Needs more technical information so that manufacturers know how to make this
2. Since the silicone cover is clear and see-through, it is hard to see it on the shoe (on the rendered version).
3. Render the product in a way that it highlights the product, not the shoe underneath.
4. Maybe go a different direction with the shoe cover so that it is easy to put on and understand/ less complicated.
5. Maybe use a material that is more breathable but still waterproof

Why?:
I think that this prototype two could make a good final, but I am going to decide to go a different direction and do some more research. I think that overall the silicone running shoe cover may be hard to use at first and silicone is not a very breathable fabric. I plan on doing more research on fabrics that are both waterproof and breathable. My new design will also be easier to understand how to use at first and will not be permanent (since you are not sticking something to your shoe).
If we were to redo this testing, we would better make the user more aware of their purpose in testing. For example, we would have more thoroughly explained the purpose for this website and why their feedback is so valuable. The more appreciative we are and the more we make the user feel important, the better quality feedback we will receive.

EMPATHIZE: Researching by Googling fabrics that are both breathable and waterproof (30 Min)

Results: Use an outer later "face fabric" made out of polyester and then a laminated membrane or coating, usually made out of Polyurethane and ePTFE. A lot of rain jackets use this type of fabric.

silverbobbin.com

Is Polyester Waterproof? Water-Resistant?

Are you looking for a new raincoat or purchasing waterproof fabric to sew your own jacket? You are probably wondering which waterproof fabric to choose. Polyester is a durable and ...

Why?:
I chose to do research on which fabrics are both waterproof and breathable because I want to incorporate that in my next prototype. In the last prototype, I use silicone. It is waterproof but not breathable.

How Do They Make Fabric Waterproof & Breathable?

Waterproof breathable fabrics consist of an outer layer called the “face fabric”, usually made of nylon or polyester, and a laminated membrane or coating, usually made of ePTFE (expanded Polytetrafluoroethylene, also known as Teflon®) or PU (Polyurethane). The purpose of the face fabric is to protect and look stylish; it’s not waterproof but is treated with a solution called DWR (Durable Water Repellent) so it doesn’t soak up water. Sometimes a layer of insulation is added for warmth.

The job of keeping the water out is left to the membrane, which has tiny holes too small to let liquid water enter but large enough to allow water vapor to escape. Since contamination with oil, sweat and chemicals can cause PTFE membranes to lose their ability to keep out water, the membrane is protected by an ultra-thin layer of Polyurethane (GORE-TEX membranes have a bi-component laminate structure) or other oleophobic (oil-hating) treatment (eVent™ does this at the microscopic level with individual PTFE fibers). Finally, a fine scrim or mesh is bonded to the inner surface for comfort in 3 Layer (3L) fabrics. 2 Layer (2L) fabrics receive a separate fabric liner, while 2.5 Layer fabrics use an abbreviated pattern screened on the inner surface to save weight. Modern waterproof breathable fabrics have come a long way since the original GORE-TEX, and most are extremely waterproof at any price point, but outstanding gains in breathability in the past few years have redefined the market in high exertion outerwear.

To learn more about outerwear including fabrics and features, check out our **Outerwear Construction Guide**.

EMPATHIZE: Researching Cycling Shoe Covers - Google and Amazon (30 Min)

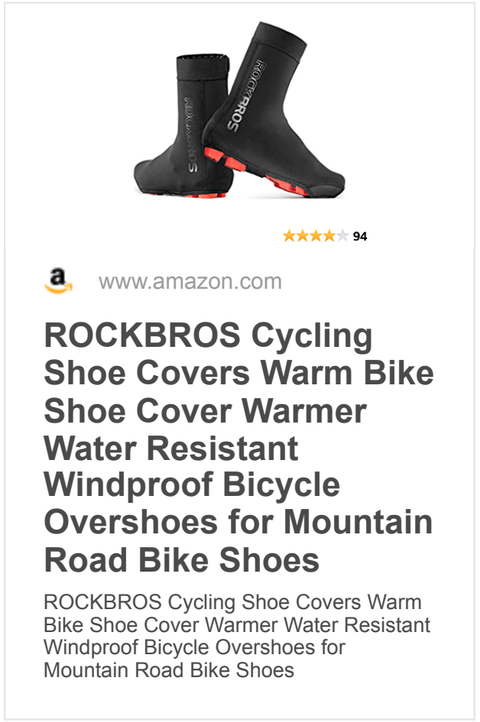
Results:

Cycling Shoe Cover:

This cover isn't necessarily waterproof but it is wind resistant and helps keep the mud off the cycler's shoes. The aspect from this product that I really like is the fact that it is made out of fabric and the way it attaches on the bottom of the shoe. it leaves some of the bottom shoe open.

Why?:

I chose to do research on cycling shoe covers because I wanted to see the way they attach to the cycling shoe. I found that there were a few effective ways, however I don't think I am going to use them in this project for what I want. I was glad I did the research though and I noticed that some of the cycling shoe covers were made out of polyester which confirmed what I had researched about fabrics.



Polyester Cycling Shoe Cover with Velcro:

The thing that I am going to use from this product is the polyester fabric it is made out of. It makes it both breathable and waterproof. I also like the velcro strap on the bottom to help keep the shoe on. It seems really easy to use.

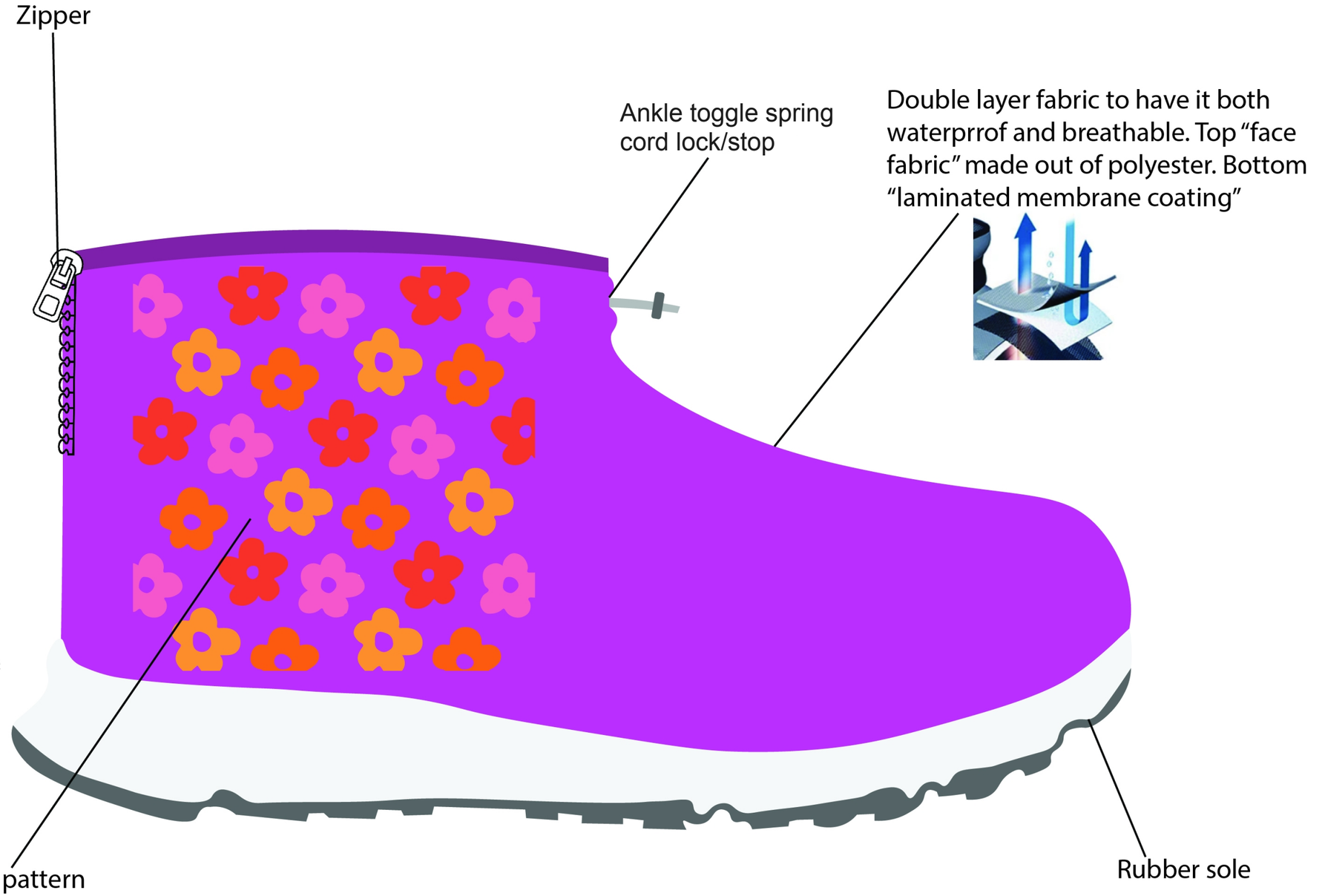
Cycling Shoe Cover with attachable bottom:

The thing that inspires me about this product is the way that you attach the bottom of the shoe cover after you put the top cover on. I thought it was cool.

DESIGN #2, PROTOTYPE 1

Full Cover Polyester Waterproof and Breathable Running Shoe Cover with Rubber Sole: Retro Floral Print

Why?:
I decided to try out a shoe cover that covers the entirety of the shoe, even the bottom. I did this to make putting on the shoe cover easier and easier to understand. I added a zipper in the back to help the user slip their foot and shoe in easier. There is an ankle toggle to cinch the cover closed to make sure no water falls in. I chose to have a rubber sole to make suer the cover doesn't break when the person steps on something sharp. I really like how the direction of this prototype is going, although I know it isn't fully there yet and I will definitely be making changes to it. I designed the prototype on Adobe Illustrator.



TEST 1 (15 Min)

Prototype 1- Full Cover Polyester Waterproof and Breathable Running Shoe Cover with Rubber Sole: Retro Floral Print
Number of Subjects: 2

Key Findings:

1. Doesn't make sense to have a sole on the shoe cover if there is a sole on your shoe. That means there would be 2 soles.
2. Fabric used is really good
3. Like the idea of making the shoe a fun pattern instead of clear

Changes to be Made:

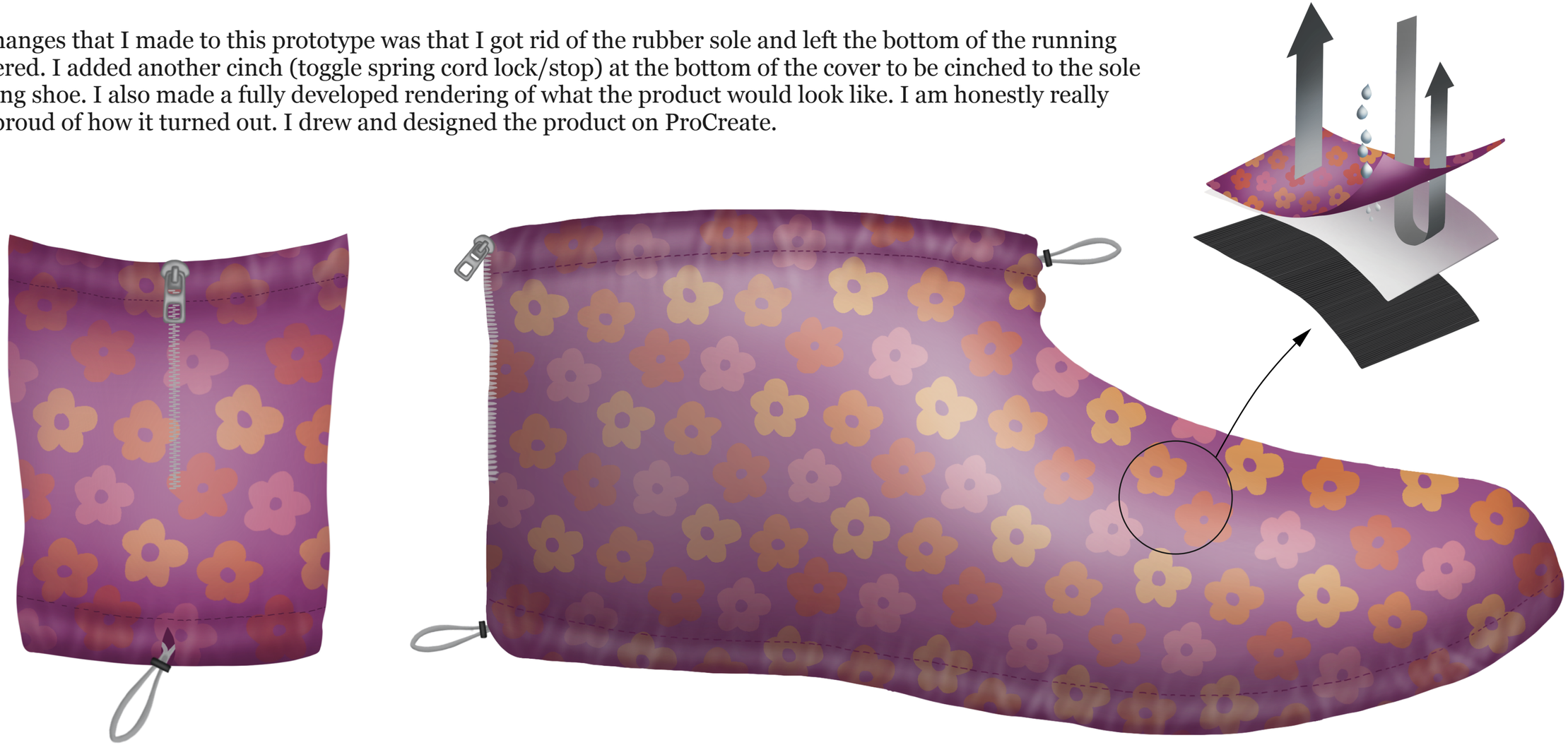
1. Leave bottom of the waterproof shoe cover uncovered to leave the original bottom of the running shoe free.

Why?:
Through this process of testing, the main thing that the user pointed out was that it doesn't make sense to have a rubber sole on the shoe cover. They suggested that the bottom of the shoe was best left uncovered to let the running shoe perform. I agree. I was glad that I tried at least one prototype with the whole running shoe covered.
If I was to do this test over, I would have them give me a little more feedback than they did. However they didn't have much else to say because they liked the new changes and the rest of the product!

DESIGN #2, PROTOTYPE 2

Polyester Waterproof and Breathable Running Shoe Cover with Ankle and Sole Cinch: Retro Floral Print

Why?:
The main changes that I made to this prototype was that I got rid of the rubber sole and left the bottom of the running shoe uncovered. I added another cinch (toggle spring cord lock/stop) at the bottom of the cover to be cinched to the sole of the running shoe. I also made a fully developed rendering of what the product would look like. I am honestly really happy and proud of how it turned out. I drew and designed the product on ProCreate.



TEST 2

Prototype 2-
Time: 15 Min
Number of Subjects: 1

Key Findings:

1. Test subject was concerned about how the ankle cinch feels and if it would be uncomfortable
2. Test subject was concerned how securely attached will it stay on the shoe and if any water would leak in through the cinched parts
3. Other than that it looks really good. It is really unique/original and the user has never seen anything like it.
4. Really likes the fabric

Changes to be Made:

1. If this was a real physical product I would test out to make sure the cinched part around the ankle isn't uncomfortable and how easily water can leak in.

Why?:
Through this process of testing, the main thing that the user said was that he loved it and that it was very unique and that he had never seen anything like it before. There were some minor concerns, but they are things that I could only test out if it was a real physical product.
The next step would to physically make the product by a manufacture and to fix any last minor problems that would be found.

JET DESIGNS

Item:	Pattern:	Designer:	Units:
Polyester Waterproof Running Shoe Cover	Retro Floral	Jasmine Tree	2500
Season:	**Gender/Size:**	**Date:**	**ID #:**
Winter 2022	Womens Size 8 USA	04/5/2022	002

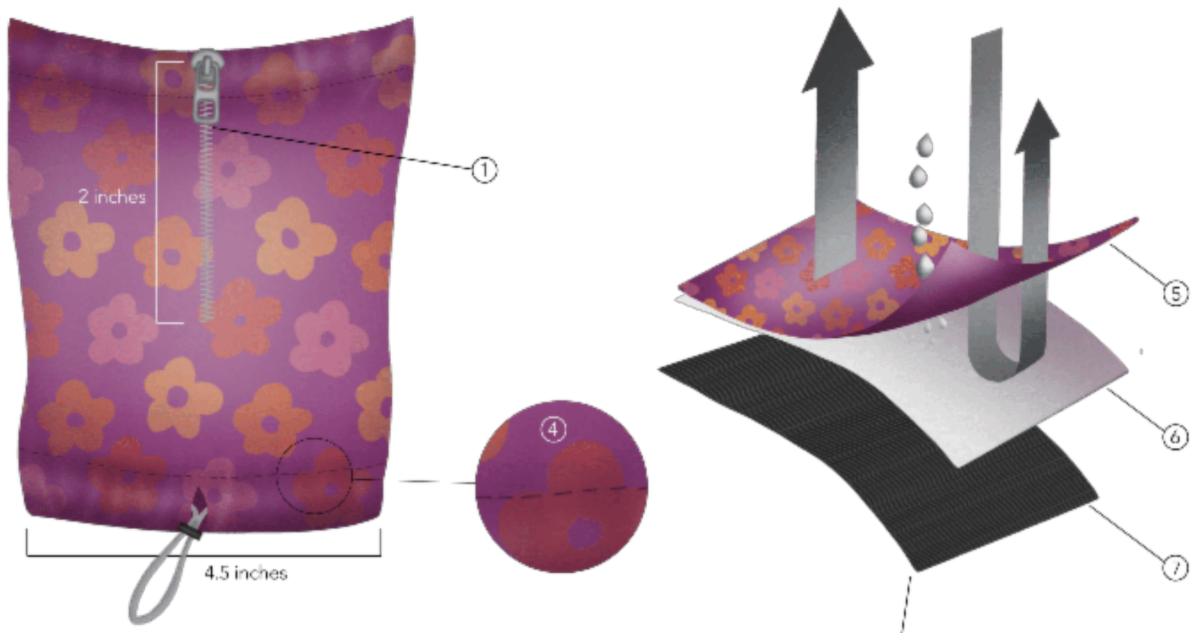
Description:

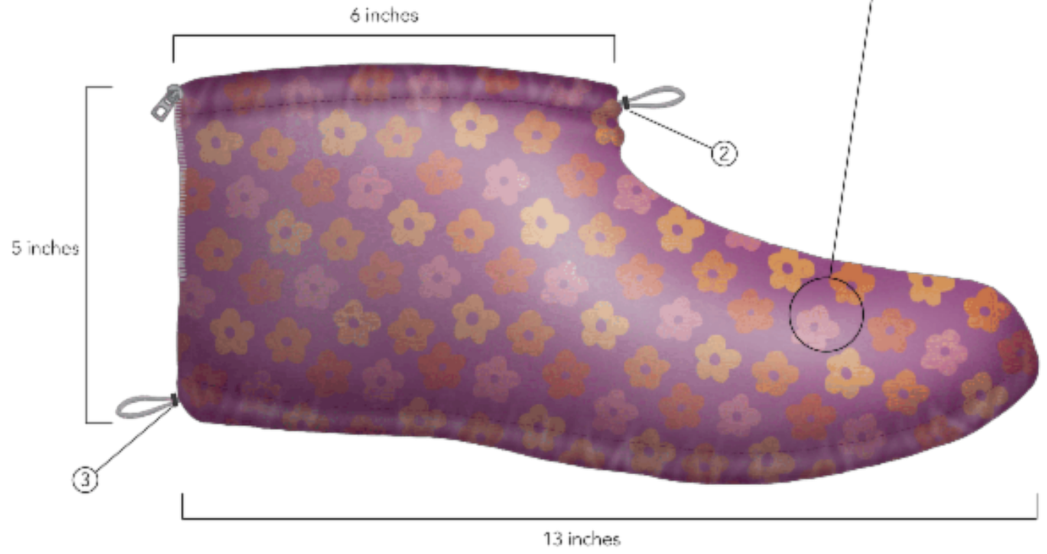
This polyeseter waterproof running shoe cover is both breathable and waterproof. The waterproof breathable fabrics consist of an outer layer called the "face fabric", made of polyester, and a laminated membrane or coating, made of ePTFE and PU (Polyurethane). The purpose of the face fabric is to protect and look stylish; it's not waterproof but is treated with a solution called Durable Water Repellent so it doesn't soak up water. The job of keeping the water out is left to the membrane, which has tiny holes too small to let liquid water enter but large enough to allow water vapor to escape.

To use this product, slip in your running shoe (unzip the zipper at the back for extra room to put your foot in) and use the cord locks by your ankle and sole of the shoe to cinch the cover tightly against your shoe.

Materials:

1. 2 Inch closed end metal zipper made out of aluminum.
2. Ankle toggle spring cord lock/stop. 1.46" Double Hole Barrel Cylinder Plastic Spring Stop Toggle. 1/8 Inch White Elastic: 14 inches long
3. Sole toggle spring cord lock/stop. 1.46" Double Hole Barrel Cylinder Plastic Spring Stop Toggle. 1/8 Inch White Elastic: 28 inches long
4. Polyester thread. Pantone color 2062C. Stitch a plain 1/2–5/8 in. (1.3–1.6cm) seam.
5. Outer layer or "face fabric" made out of polyester treated with a durable water repellant.
6. Laminated membrane/coating made out of a ultra-thin layer of polyurathane.
7. Laminated membrane/coating made out of ePTFE (expanded Polytetrafluoroethylene, also known as Teflon®).





IMPLEMENT: Final

For the final I created a Tech Pack for the product so that manufactures would know how to make it. It has all the measurements, materials, and things you would need to how make it. It also outlines a description of the product and how to use it.

The first plan of implementing this product would to send it to a manufacture to only make a small amount of this product and continue testing to work out any last minor issues.

The second plan for implementing this product would to send it to a manufacture to make and then start selling them online or in stores. I could even start my own business and start selling these specifically to runners.

Why?:
The final prototype accurately reflects my HMW statement. This product is durable, easy to use, breathable, waterproof, and doesn't affect the way that your running shoe would perform. I am really happy with how it turned out and I would use this product.

JET DESIGNS

Item: Polyester Waterproof Running Shoe Cover	**Pattern:** Retro Floral	**Designer:** Jasmine Tree	**Units:** 2500
Season: Winter 2022	**Gender/Size:** Womens Size 8 USA	**Date:** 04/5/2022	**ID #:** 002

Description:

This polyeseter waterproof running shoe cover is both breathable and waterproof. The waterproof breathable fabrics consist of an outer layer called the "face fabric", made of polyester, and a laminated membrane or coating, made of ePTFE and PU (Polyurethane). The purpose of the face fabric is to protect and look stylish; it's not waterproof but is treated with a solution called Durable Water Repellent so it doesn't soak up water. The job of keeping the water out is left to the membrane, which has tiny holes too small to let liquid water enter but large enough to allow water vapor to escape.

To use this product, slip in your running shoe (unzip the zipper at the back for extra room to put your foot in) and use the cord locks by your ankle and sole of the shoe to cinch the cover tightly against your shoe.

Materials:

1. 2 Inch closed end metal zipper made out of aluminum.
2. Ankle toggle spring cord lock/stop.
   1.46" Double Hole Barrel Cylinder Plastic Spring Stop Toggle.
   1/8 Inch White Elastic: 14 inches long
3. Sole toggle spring cord lock/stop.
   1.46" Double Hole Barrel Cylinder Plastic Spring Stop Toggle.
   1/8 Inch White Elastic: 28 inches long
4. Polyester thread. Pantone color 2062C. Stitch a plain 1/2–5/8 in. (1.3–1.6cm) seam.
5. Outer layer or "face fabric" made out of polyester treated with a durable water repellant.
6. Laminated membrane/coating made out of a ultra-thin layer of polyurathane.
7. Laminated membrane/coating made out of ePTFE (expanded Polytetrafluoroethylene, also known as Teflon®).