

# 1. Design Brief

**Context**  
 You are required to design and make a storage solution (project/outcome) for yourself, Whanau or the community. You will need to make this in the school wood workshop.

**Brief**  
 What are you planning on making?  
 Shoe rack  
 Who will you be making it for?  
 Mother  
 Why do you or others need this? In my culture we do not wear shoes inside the house. We have a number of shoes lying around the front door which my mother finds messy.  
 When do they need this? End of term 2  
 Where will they be used? Outside the front door  
 What cultural beliefs does the user have? Yes see above

What are you planning on doing? I am going to make a shoe rack which can be used to keep the shoes we leave at the front door organised and tidy.

**Stakeholders**  
 Who are the people you will involve in the designing and making of your project/outcome  
 Mum, Dad,

- Environments
- What environments will be used?
- Making School workshop, Storage, share tools, work with others to keep the workshop safe and clean
- Use Backyard, Water proof, easy to clean, sealed,

I will need to use the school workshop. This will require working with other students so I will need to be safe and share tools and machinery and spaces. I will also need to keep the work area tidy and put tools I use away.

- I will use the outside the front door and although it is covered it will need to withstand the weather and dirt from the shoes. I would also like it to be easy to clean

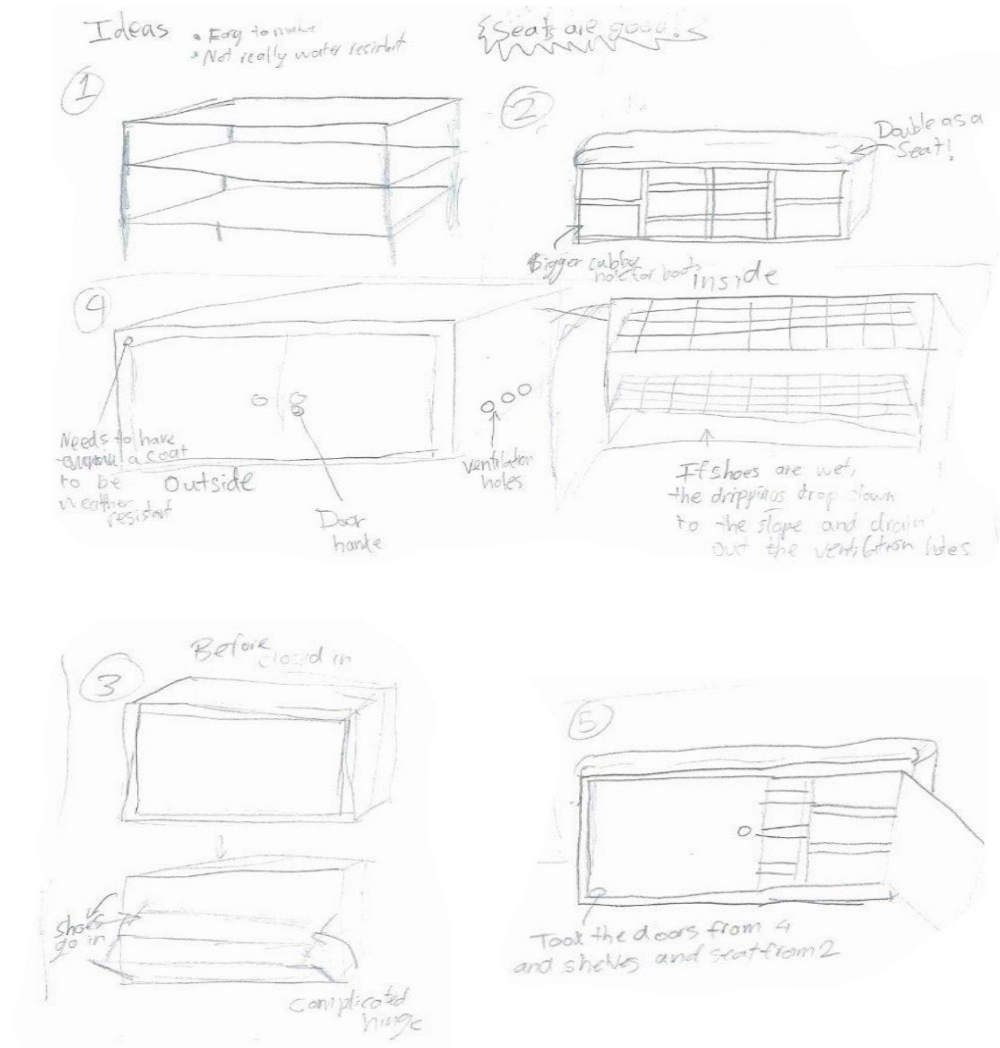
- What Physical requirements will the outcome need
  - Box shaped, strong, light to carry, waterproof and easy to clean
  - The shoe rack will need to be big enough to fit the 6 pairs
  - It must be strong enough to hold the shoes without breaking
- The shoe rack will need to withstand water and dirt
- The shoe rack must be as light as possible
- The must be easy to clean

What Functional requirements will be need

Open lid and a draw, lockable to keep safe to stop things falling out, Handle

- The shoe rack will have stop to stop the shoes falling out
- The shoe rack will have feet to keep it off the floor and stop water from being puddled under it.
- The shoe rack will be made so that it is easy to put in and take out the shoes
- The shoe rack will have a way of cleaning dirt and other things off them before they are put in the rack
- The shoe rack will have air vents to help the shoes to dry if they get wet.

## INITIAL IDEAS



## Stakeholder feedback for ideas

- What do you like about the idea and WHY?

"I like how in designs two and four have a backing, so the shoes won't fall to the other side. The drainage system in design four is pretty good idea to have on a rainy day."

"I like this one because it has mesh inside to help drain water from wet shoes. Because I think this idea would be useful."

- What do you dislike about the Idea and WHY?

"I don't like the door idea; I know it would be useful to get rain off the shoes, but I don't think in daily use it would be worth the hassle to open and close the cupboard every day."

"I don't like the first design; It looks boring and too easy to make"

- What would you suggest that would improve the design and WHY?

"I suggest removing the doors from the design because I think it's going to add another inconvenience in our morning routine."

"To add to the drainage idea, a small fan inside would be good to help aerate the shoes and help them dry quicker, ready for the next use. A container in the bottom would be good to catch the water."

- Which one of the designs should I develop and WHY?

"I think you should a combination of one, two, and four. And grab the best things from those designs, like the drainage from four, and shelves from number two."

"You should keep working on the drainage idea, because it looks the most useful idea to work on and improve."

### Stakeholder conclusion:

Both stakeholders told me that they like the drainage idea for wet shoes, I guess I should continue develop that idea further. But I think I also add my mum's advice to remove the doors from the design as well, because I agree with her statement that it would be a hassle that to open the rack everyday.

## Stakeholder feedback for refined ideas

- What do you like about the idea and WHY?

"I still really like the amount of space for shoes. This will have enough room for everyone's shoes. And also the I love the addition of the side shelves for bigger shoes"

"I like how there is abundant of space for shoes, you could even use that space for non shoe items, I guess."

- What do you dislike about the Idea and WHY?

"I starting to think that there is too many shelves maybe add only two? Because it would be cramped, this is will make harder to put shoes in and dry shoes."

"Maybe the drainage slits could be replaced by holes, because it would look more aesthetically pleasing and be more structure stable."

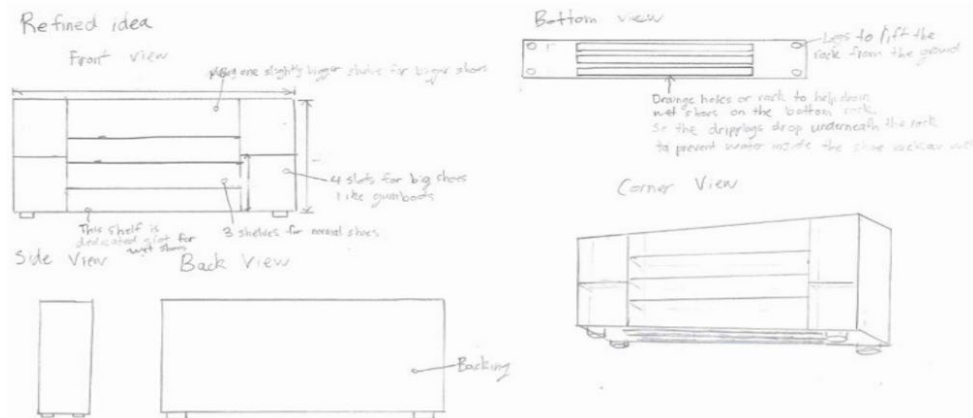
- What would you suggest that would improve the design and WHY?

"I would add adjustable shelves by adding dells to have more choice later on what position the shoes would be on. This both create more function attributes and making the shelf replaceable"

"I suggest adding a roof, and make it slanted to prevent water build up on the top of the shelf. This will make the shelf have better weather resistant"

### Stakeholder conclusion:

Their advice will be incorporated into the next design by having my mums idea on having adjustable shelves that you can easily move and replace, and her idea on having on less shoe shelf to make it easier to put in shoes. In addition ideas on having a roof to have more weather resistant and his idea to swap out the drainage slits to holes to be more strictly stable and stronger. Both stakeholders advice was very useful and informative, that is why I'm adding all their ideas.



© NZQA 2025



## Ideas Testing

I have taken all my stakeholders advice and the refined idea plan to design a model of what the shelf would look like, the main things added was the feature of it having a shelf to increase weather resistance and checking out if the scale is correct and to my liking. Both stakeholders agreed this is a great start and no further comment was given.

## Ideas testing

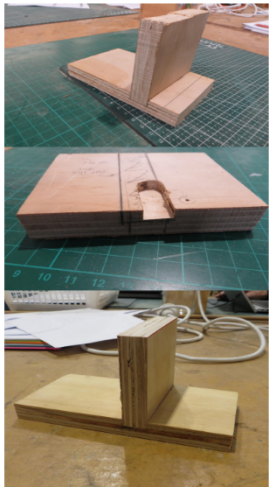


( a stakeholder) told me a good suggestion if the surface on the top rack is flat. When it rains the water stays on the top and damages the wood over time

He suggest adding a slope would get rid of the water faster, and limiting the amount of water on the top of ramp.

Another thing he suggested is adding a ledge to minimise the water creeping in from the bottom

## STAKEHOLDER FEEDBACK



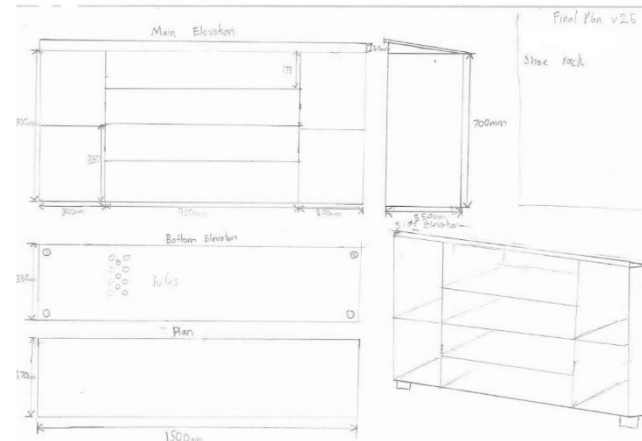
### comment on joint testing:

*"The dado joint looks like it will be good for shelves and seams very strong, I don't really dislike anything with this design. But maybe you should add nails on the outside throughout the cut out slot piece to add more strength to the joint."*

### My comment:

One of the aspects of my designs is join two pieces of wood in a 90 degree angles with having it to be structurally stable. I tested the dado joint as it would be perfect and better than a butt joint, i tested two methods; chisel, and router. The chisel method was slow, and the end result was not even causing the joint not exactly being 90 degrees. The router method was seamless and faster while still having the joint to be exactly 90 degrees. Both stakeholders agreed that the router method was the best way to create the joint. But asked if i should add nails to the joint, I didn't go with his feedback because i wanted a seamless design on the exterior of my shelf.

## Final Plan



Please note: that In the back of my blueprints was the specifications that I should I add a coat.

The design shows three adjustable shelves, but later on, both me and my stakeholders decide to make it only have two adjustable shelves.

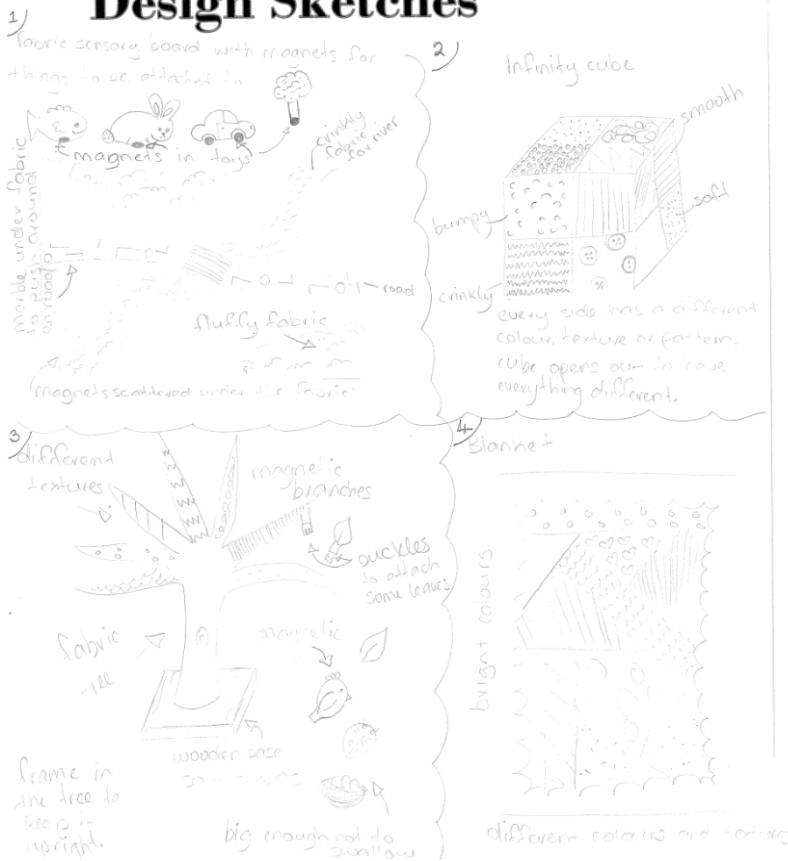
## EVALUATION

I think it partially met my design brief because it fits most of the requirements of it. This explored and incorporated stakeholder feedback by having my parents and my classmates share their ideas and thoughts during the creation of my shoe rack. For example, I chose a modified shelf design because both stakeholders thought it was a good idea and easier to make, and the idea of having a roof to prevent water leaking to shoes was from ( a classmate). The shelf passed the requirement to fit more than six shoes, having more than expected and incorporating multiple types of shoes in constipation while designing and at the same time, having its structure integrity without being compromised. In it has an accessible and safe design by having curved corners to prevent injury and having coat to amplify its weather resistance. But I wouldn't say it fully met my design brief for two things, is that the shelf didn't have drainage holes like the design. It was a mistake on my end because I forgot about it during the manufacturing phase. In addition, most points were glued on, which prevents any repairs other than adjustable shelves, and legs that are easily replaceable.



I brought it to the environment that the shelf is going to be to test how much it fits the requirements. Its outside of my house so it would encounter a lot of weather, this means that weather resistant is strongly required. I tested how strong and stable it by adding weights, and the shelves weather resistant is tested when i sprayed it with water, it was successful. All aspects were tested and was successful.

## Design Sketches



## Stakeholder Feedback

### 1. Which design is your favourite and why?

Stakeholder 1: Infinity cube

Stakeholder 2: I really like all 4 of your ideas, any one of them would be amazing, Infinity cube could be awesome.

Stakeholder 3: I love 1 and 3, 3 has the potential to look amazing if done well.

Stakeholder 4: I like all of your ideas. Product #3 is very cool, something different. I like the idea of being able to put items on and off the tree. Very interactive product, talking with students, asking them to put the bird on the tree or take the nest off the tree.

### 2. What textures would be preferred by the students?

Stakeholder 1: Any texture as long as it doesn't stick or rub roughly against my hands.

Stakeholder 2: texture wise anything that feels cool: fluffy, sequin, bumpy but also shiny, reflective, crinkly.

Stakeholder 4: Anything that would feel good on the hands, rough, smooth, fluffy, bumpy.

### 3. What would you change about the product?

Stakeholder 1: I like the concept of sensory, colours may be something you would consider.

Stakeholder 3: Magnets in the toys are a great idea.

Stakeholder 4: I think your concept is fantastic, making it bright and tactile,

### 4. What size would be best for removable objects? (designs 1 and 3)

Stakeholder 1: Easy to handle size, or though you could do large sizes and can be like a squish ball.

Stakeholder 2: No less than 7cms due to choking.

### 5. Extra feedback

Stakeholder 4: You would need to make sure the tree didn't fall over. How are you making the leaves, birds, etc?

I chose to do design 2 (the infinity cube). I did this because I got feedback for design 2 and 3 specifically but 3 would have taken too much time.

## Materials and Component Testing



Stretch velvet, faux fur, sports mesh, stretchdenim, cotton canvas, sherpa, corduroy and fleece performed the best when I tested a selection of fabrics durability. I will use these because they fit the brief as they are the most durable fabrics I tested. They have the widest range of textures, like my stakeholders wanted. The purple glitter mesh, foil mesh and poplin didn't do as well in the test however I will still use them because I will double layer them with a more durable fabric. I am using the glitter and foil mesh because my stakeholders asked for some shiny and reflective fabrics.

I will not be using any muslin, very lightweight cotton or fine sports mesh as they do not fit the brief of being durable.

Satin did not do great when I tested it but it adds an important texture that I can't get with any other fabric. I tested two different satins and the second one was much stronger so I will only use that one to make the design more durable to fit the brief. I rubbed a selection of fabrics in dirt then used a damp cloth to wipe it away:



Te Ao Mārama / Prototype  
To analyse, choose, create

## Prototyping

I made a prototype of my cube using calico fabric. I made a few mistakes like sewing some of the squares on upside down, these were easily fixed by just unpicking them. I will be more careful in my final design to make sure I don't make the same mistakes. I got confusing because there were too many squares all the same fabric, my final design should be less confusing because I will have lots of separate fabrics. I cut notches into all my pattern pieces thinking it would make it easier to line up all my squares, this was not the case. Because they are such small pieces, it was easy to line up all the squares without using the notches. I will not cut notches in my final design to save time when they were more hassle than they were help.



# Stakeholder Feedback

|  |  |
|--|--|
| <b>Attributes for Stimulating</b><br>-Texture<br>-Noise<br>-Visual<br>-Interactive   | Comment:   |
| <b>Attributes for Calming</b><br>-Texture (Smooth, relaxing)<br>-Visuals (muted colours)<br>-Sounds (relaxing, less abrasive)<br>-Repetition | Comment:<br>Good variation in textures with a range of different ones; any of them will work but a couple a little scratchy so may not be calming<br>No noise associated so this is good for calming<br>Colourful fabrics chosen so any will work - perhaps warmer colours will give more of a calming effect<br>I like the interactive nature of this product as the ability to keep playing with it with no end point (repetitive) would suit the client well; and it keeps changing colour which keeps the interest of the user |
| <b>Mostly Sewn</b>   | yes  |
| Size   | good size; can be easily manipulated   |
| Cleanable  | This could be problematic. Could it be 2 layered with the outside layer removable for washing? To have wipeable fabrics would take away the textures effect which would be a shame   |
| Durable  | Durable enough. Could double stitch seams to improve durability  |
| Engagement   | Excellent - see above  |
| Safety   | Looks pretty safe to me - just the washability aspect to think about   |
| Senses   | I think it is soothing and would just keep the client engaged with the repetitive nature of it - constantly changing colour and moving with a different feel with each turn.   |

Q1: Is there enough variation in textures?  
Are there any specific ones you don't like?

A1: Yes, I love the fabrics you have chosen.

Q2: Would you like warm or cool colours?

A2: Cool wouldn't be as calming.

Q3: Is the size of the cube good?

A3: Yes its good, not too cumbersome to handle.

Extra feedback:

Awesome idea to have double layered fabrics.

Perhaps link flower squares together, corduroy squares together.

My stakeholder feedback suggested making a cleanable cover for it. However, due to the complexity of the design and the time I had to create it, I couldn't make a cleanable cover for it. To fix this issue I have tested many fabrics and selected the best ones that can be wiped clean with a damp cloth.

Another thing my stakeholders mentioned was maybe double ~~the~~ stitching it for durability. I have chosen not to do this as it would have taken too much time. I made sure to only use fabrics that were durable and didn't wear quickly.

I didn't focus on linking certain types of fabric as most fabrics will end up next to each other as you unfold the cube, also having all the corduroy, for example, would make the design feel uneven.

# Evaluation

## Initial Brief and Specifications

The School have asked you to create an outcome to keep the students engaged in their sensory room. The outcome you are to create and construct needs to either calm or stimulate a students senses.

- Use fabric with correct performance properties for the nominated end use.
- Mostly constructed with a sewing machine and have a high standard of finish.
- Easily Cleaned
- Durable
- Fit for purpose



### Final Stakeholder Comments

"Holy moly that's amazing!"  
"Speechless"  
"It's cool to be able to feel all the textures, really cool to be able to fold it out."  
"I didn't realise at first you could fold it out but its so cool to have new textures each time you unfold it"  
"I have one at home but its all the same texture, this one is cooler and better because its all different textures"

| Is your outcome:  | Yes/ No        | Comments   |
|---|----------------|--|
| Calming or Stimulating  | calming        |  |
| Engaging  | yes            | Repetitive and keeps the students attention to feel and see the different sides.   |
| <b>Have you met your specifications?</b>                                    | <b>Yes/ No</b> | <b>Comments</b>  |
| Use fabric with correct performance properties for the nominated end use    | yes            | All soft fabrics, all different textures, colours, and patterns.   |
| Mostly constructed with a sewing machine and have a high standard of finish | yes            |  |
| Easily Cleaned  | yes            | I tested a lot of my fabrics and I used the ones that were easily wiped clean with a damp cloth.                           |
| Durable   | yes            | All my fabrics were durability tested and I made sure not to use the nes that did badly.                                   |
| Fit for purpose   | yes            | It calms students' senses and engages them with its calming repetitiveness but also engages their visual and touch senses. |

### How have you created a fit for purpose outcome that meets the requirements of the end user?

By using 48 different fabrics of multiple textures and colours, I have created an infinity cube that calms students' senses by repetition and smooth and soft fabrics. It is cleanable and durable and mostly constructed with a sewing machine.

### How did you use stakeholder feedback in the development of the outcome?

Since the start of my project I have been taking onboard my stakeholders feedback and adjusting things where needed and suitable. For my first lot of feedback I listened to what design they would prefer, and took onboard their comments about size and specific fabric textures.

For my later lots of feedback I listened to my stakeholders when they said they would like warm colours as they are more calming. I listened to their concerns about cleanability and durability but I did not do what they suggested as I found other ways to make them durable and cleanable.

### How did your testing and prototyping inform your decisions you made throughout the process whilst developing and creating your outcome.

When I tested my fabrics for durability, I made sure not to use the fabrics that performed badly and tore immediately, same with the fabrics I tested for cleanability. I didn't use some of the fabrics that I tested because it was quite hard to get dirt out of them just by wiping.

When I made my prototype, I made a few mistakes that I had to undo. When I was making my final, I did things in different order, as to avoid the issues I came across in my prototype.



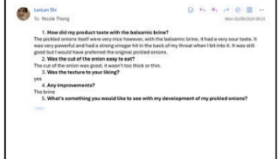
STAKEHOLDER FEEDBACK

PERSONAL JUSTIFICATION



**POSITIVE:** Reflecting on my stakeholder feedback, I am happy to receive more positives than negatives on my first cooking trial. When researching pickled onions and how to present them, most photos showed these vibrant variations of pickled onions paired with cucumber, avocado, salmon etc. It definitely inspired me on how I would want to present my dish, so I'm very glad that I met expectations within the presentation. I feel that nearly everyone eats with their eyes first, so by choosing pickled onions which are a pink vibrant color I thought this would be the perfect product to make as it also fits all the specifications. Besides the presentation, both my stakeholders really enjoyed the taste of my product and how well the flavors balanced between acidity, sweetness and saltiness. When researching for different pickled onion recipes, there were many different vinegars to choose from, so I had to be sure with what flavors I was after. Ideally regular white vinegar is the most common to use in the brine process for the onions, but I felt that plain white vinegar would have too much of the acidic taste which is not what I was going for, as I wanted something that had balance in flavor too. So deciding on rice vinegar as my outcome for my brine, I was able to achieve a well balanced flavor of pickled onions.

**NEGATIVE:** The only negative feedback that I received on my first trial was the sizing of my pickled onions. I too would agree with this statement as I was quite confused on how to get the "perfect" cuts on my red onion. But also I am able to take the next steps by trialling different methods of how to cut

|   |   |   |
|---|---|---|
| <p><b>POSITIVES:</b> My second trial of pickled onions was very different from my first trial. The outcome of my pickled onions within size and width exceeded my stakeholders and I's preferences. In this trial I had decided to experiment with the brine as the brine is the main component that determines the onions flavor profile. I had decided to do a balsamic vinegar brine after researching a variety of vinegars to use. The balsamic vinegar has a very strong flavor profile as well as smell. What also draws me towards choosing the vinegar was also the dark colour.</p> | <p><b>NEGATIVES:</b> I'm going to be completely honest with the negatives of this trial but I myself, including my secondary stakeholder, aren't really pleased with the flavor of balsamic vinegar pickles. Like I said before this specific flavor is very based on your preferences if you like balsamic or not. I personally think the balsamic is so pungent and strong that it almost hides the taste of the onions which isn't what I want. Although you could use the brine as dressing for salad as that pungent taste would pair nice with something more balanced.</p> | <p><b>IMPROVEMENTS:</b> I think improvements wise I will have to personally learn how to use a mandoline as the cuts were actually not the same width. This image is an example of how some rings were regular and some were cut half off.</p>   |
| <p><b>STAKEHOLDER FEEDBACK:</b></p>    | <p><b>SECONDARY STAKEHOLDER:</b></p>    | <p><b>OVERALL DECISIONS + NEXT STEP:</b> My final decision is to probably not continue with making pickled balsamic brine as I feel that balsamic is too high in taste of acidity and it definitely is more on your preferences if you like balsamic. My next step is to continue with the rice wine vinegar pickled onions and I will trial it further with adding cucumbers to the brine.</p> |

**CUTTING**

When your knife strikes the surface of the ingredient, there is a split second during which the food beneath the blade is compressed into a V-shaped valley.

Secondary stakeholder: "I did not find the width of the onions easy to eat, as it was too thick and this would definitely need to be fermented longer in order for the onion to fully soak in the brine."

This was my second time cutting my onions with a knife, and I would say myself as a beginner it's really hard to achieve those uniform cut slices where they are all thinly sliced and even, so I think a mandoline would be better.



**SLICING**

Slicing is a general term that means to cut across the grain into thin, uniform pieces. Almost every fruit or vegetable can be sliced, as well as other ingredients.

Both stakeholders: "We both prefer this thinly cut onion over thick as the onions are able to soak in the brine more easily and we both feel that flavors taste better when thinly sliced."

The mandoline was my favorite equipment to use as the onions came out perfectly thin which achieved the standards and preferences of both my stakeholders.



**Main stakeholder:** "The rice wine vinegar pickled onions with cucumber offer a refreshing, crisp, and subtly tangy bite. The onions have softened just enough to lose their raw sharpness, yet still hold a light crunch that complements the cucumber's clean, watery snap. The rice wine vinegar adds a gentle acidity that's less intense than traditional vinegar, bringing out the natural sweetness in both vegetables. The flavors meld beautifully, creating a delicate balance between the mildly pungent onion and the cool, refreshing cucumber. This pairing would be an excellent accompaniment to rich dishes, as it provides a light, palate-cleansing contrast without overpowering."

**Secondary stakeholder:** "These rice wine vinegar pickled onions with cucumber are super refreshing and add just the right zing. The onions still have a little crunch but aren't as sharp as raw—they're tangy and slightly sweet, while the cucumber stays nice and crisp. The rice wine vinegar brings a mellow acidity, not as harsh as regular vinegar, so it all tastes really light and balanced. Together, they're the perfect cool, crunchy bite to break up richer flavors and keep things interesting without taking over."

In summary, the feedback I have received from my stakeholders identifies that the rice wine vinegar pickled onions with cucumber have a refreshing and well-balanced flavor. The pickling process softens the onions just enough to tone down their raw sharpness while still keeping a satisfying crunch. The rice wine vinegar's mild acidity enhances the natural sweetness of the onions and cucumber, creating a light, balanced taste that does not overpower the vegetables which was a goal that I really wanted to achieve. Overall, the pickling process produces a dish that highlights the natural flavors of the onions and cucumber in a flavorful, balanced way.

The process of testing and trialling my pickled onion recipe was a really enjoyable experience. Having the opportunity to develop a product that my stakeholders and I enjoy eating allowed me to learn a lot from feedback, to taste, texture etc. Stakeholder feedback was crucial in refining the recipe to better suit a range of preferences and ensure its marketability. By listening to their input on flavour balance and texture, I was able to make adjustments that ultimately enhanced the product's appeal. This collaborative approach not only improved the final outcome but also strengthened my relationship with those invested in the project. Collaborating with stakeholders provided invaluable insights that I might not have considered on my own. Their diverse perspectives enriched the development process and highlighted the importance of incorporating varied viewpoints in product creation. Within the three trials that I have tested of my pickled onions, I had finally decided on my base flavour to be rice wine vinegar and to add a new addition... that being cucumbers. I implemented the changes and the results were amazing. The cucumbers added a unique twist to the flavour, and the quality of the product was even better. I was extremely pleased with the outcome of the collaboration.