

# Opportunity or need identified

After a lot of thought I decided that I will demonstrate manaakitanga by making a container for my brother XXXXX (he is 12 years old and my primary stakeholder) to store his rubix cubes to make it easier and more convenient to store them. Because he doesn't have an associated spot to put his cubes and they can be a bit of a hazard when they're lying around everywhere. He does try to avoid this, but I think if there was a unique and associated place to put his cubes, they'd be in a safer spot and won't get damaged. It will also make use of better storage space in his bedroom that he with our younger brother.

## Specifications-

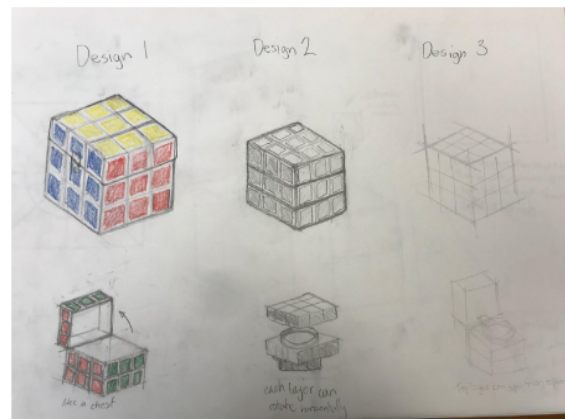
- It opens like a chest
- The minimum volume is 5000 mm<sup>3</sup>
- It must look like a rubix cube
- It must fit in the intended environment
- It must interpret the characteristics of my stakeholder
- It can store up to 20 cubes max
- Must have a spinning mechanism to it

## Development of design ideas

I first gained inspiration from a photo I found on the internet of a rubix cube inside a rubix cube. The main changes of my concepts were all in thought of 'is this what my stakeholder would want?'. The **first design** as shown in the image is using the concept of that of a minecraft chest as it was what my stakeholder described when I asked him 'what is your preferred way to open a container?'



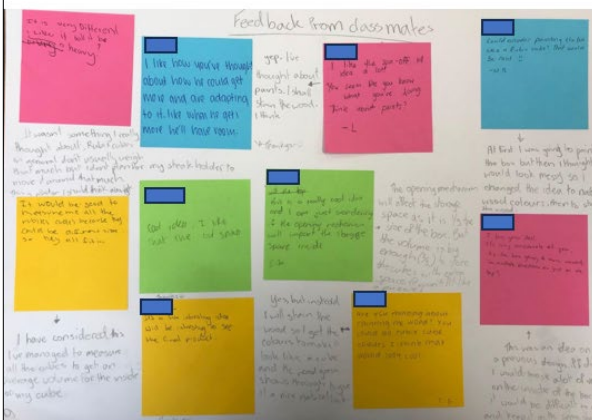
In my **second concept** I was more inspired by the first photo I saw which inspired me with a spinning mechanism. The inside was going to be somewhat a cylinder shape and there would be layers that could spin to give the effect of a real working rubix cube.



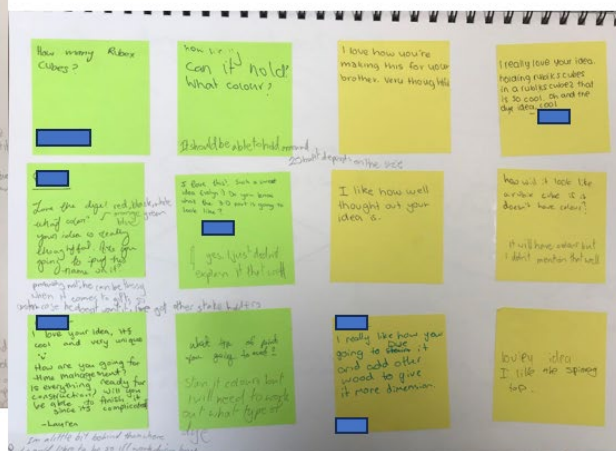
Lastly, my **3rd design** is like a combination of both. The bottom 2 layers are solid so my stakeholder can store more cubes but the top layer can spin and there is a hinge so the lid can still open up like a minecraft chest, as what my stakeholder wanted.

Originally I believed I could work my way around the hinge opening and it could still work but during this process I came to the conclusion that it was never going to work so with the help of my expert stakeholder we came up with a working solution that was the best of both worlds

## Comments and suggestions



This is the first part of feedback I received from my classmates during the designing stage of our Projects



This is the second part of feedback I received from my classmates near when we have all started the construction process of our projects 4

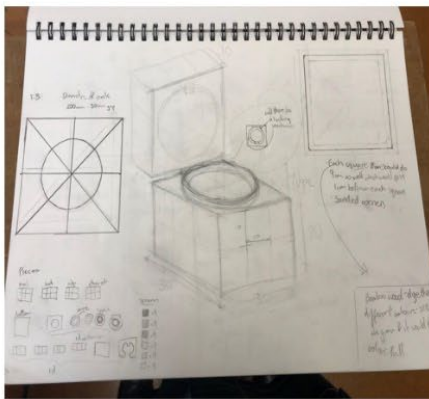
# Initial ideas and first feedback

The most common suggestions I received from my classmates was 'Are you going to paint it?'. Initially i was going to paint it but then I thought it would look messy with the paint strokes so I then decided to use different colours of wood so it would still look somewhat like a rubix cube, and it would embrace the fact that it is made out of wood. But due to the amount of suggestions of how cool making it colourful would look, I then decided to combine both ideas using woodstain. This would get me the colours I wanted and it would show the texture of the wood underneath. I talked about it with my Mum (who represents my stakeholder as I want this to be a surprise) and she thought this was the best solution for it.

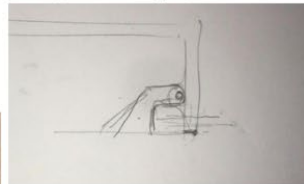
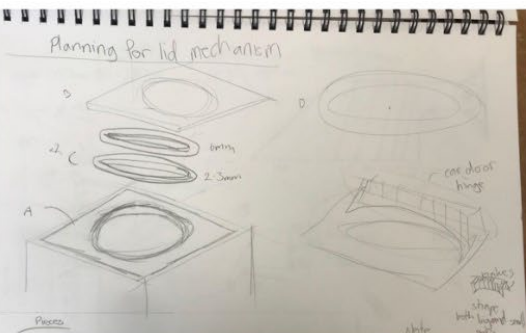
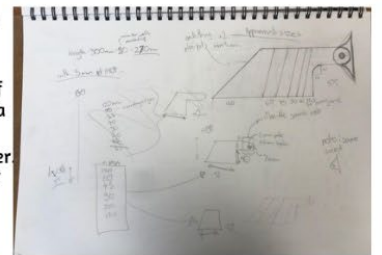
One comment asked me if the mechanism would impact the storage space. I also received multiple comments asking how many it will hold. When I started this project, the first thing I did was measure the intended environment to see the maximum dimensions of the container and calculated the total volume of all my stakeholders cubes to see the minimum dimensions I would have to make the cube. The minimum volume was approximately 5000mm<sup>3</sup> and the maximum volume was 400 x 450 x 500 mm<sup>3</sup>. So In conclusion I knew size wouldn't be much of a problem and the dimensions had to be less than 400 mm. In the end I decided on clean measurements of 300 x 300 x 300 mm<sup>3</sup> (I also checked this with my representative stakeholder and she approved on the sizes and thought it was a suitable size for a container).

Lastly, during the second part of my feedback, I went through a phase where I was almost considering on changing my concept back to the original design, easy, plain and simple (basically giving up on the fancy mechanism idea). But after a lot of convincing from my peers with comments on how cool the mechanism would be and from my representative stakeholder she thought the lid would be interesting and unlike any other, I decided to continue working on the lid mechanism so make it work with both function and aesthetic.

# Development of design ideas



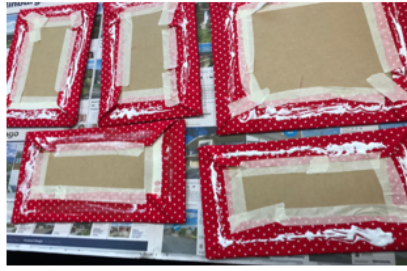
My original idea was for it to open like a chest using 2 hinges. This was then changed to an idea of having multiple spinning layers and the lid would just be something you would take off. I then scrapped this idea because my stakeholder prefers containers to open like a minecraft chest. A recommendation from expert stakeholder was a spinning mechanism where only the top lid spun and it could open up. Having a hinge to open it up wasn't going to work. With the amazing help of my expert stakeholder we came up with a concept where it uses the idea of a car door hinge. We cut out test pieces to get an idea of how it works and I developed it further to make it fit for the opening mechanism of the container. This was the hardest part of the construction process as it took many, MANY hours of planning and developing it to make it work and fit properly.



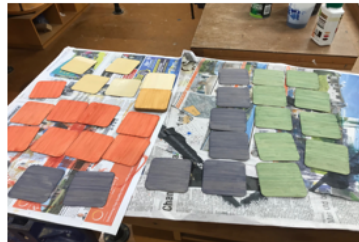
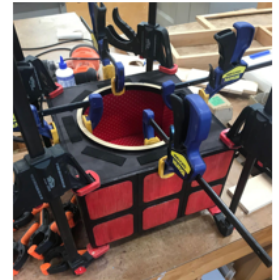
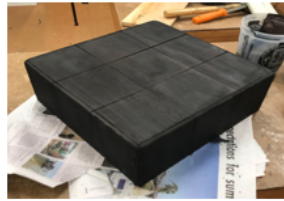
During the process of designing the mechanism for the second time the length from the side of the lid had to be longer and lower in order for the joint to make it work better which meant I had to remove some of the pieces because they were just too small and weren't doing anything other than looking pretty.

# Construction Process

Before I stained I did a lot of sanding to make it smooth. I used a router but that backfired as a part of the plywood had an air hole and so I decided to file the rest of the container. After a labored process of sanding I then got to begin the staining process. I had a good blue, white, red and green which I used which made the panels look like rubix cube. After all the staining I decided on the interior of the container. I used cardboard, batting, fabric (colour was chosen by my stakeholder), tape, adhesive spray and glue. This added cushioning so that when the rubix cubes are put into the container they won't get damaged.



Gluing the panels was a lot more tedious than I thought it would be. When I glued them on, they started curling so I had to use a lot of tape to glue down the corners. I used a fine piece of sandpaper to give the container a final smooth surface then varnished to protect the whole thing.



This is my Manaakitanga Product in its intended environment. The location is a shelf in my stakeholder's wardrobe. Previously he stored all of his rubix cubes on the shelf, it was a convenient spot to place them as they were easily accessible, but I believed the shelf could be put to better use of storage space.

## Stakeholder's reaction:

I finished my project on the 23rd of June which was a rather convenient timing because it was his birthday the following day. I decided to wrap it so it would be more of a surprise when he opened it. When he saw the enormous cube he was a little confused, but he had a big grin on his face, so that was a plus. When he opened it up I could tell that his face lit up. He said that it looked really realistic, and it looked pretty cool. He even went to get his own Rubix cube to check that the colours were on the right side and it passed, I had a small sigh of relief. I told him to open it and first he was a little stumped but when he opened it, he was impressed. I told him how it worked and according to his actions he was rather fascinated at how it was all put together, so I think he really liked how it opened and how it spun like a normal cube.

Overall, from his reactions I think he is really happy with it and likes it a lot.

## Fitness for purpose and conclusion

Overall I believe my project is fit for purpose, I personally believe that it does fit the brief and all the specifications I wanted to include in this project. I think I have interpreted Manaakitanga well because sometimes my brother has trouble fitting in so he spends a lot of time focusing on his hobbies. I wanted to show him that I am interested in his hobbies as much as him so we have a way to connect through Rubix cubes. He is rather protective over his cubes (as many arguments have started over them because of it) but he never had an associated spot to store them other than on a shelf which other family members could easily access them (primarily our little brother). They also risked getting damaged. In previous moments he has sometimes broken his cubes so by storing them in a more protective environment they are safer and have a smaller risk of getting damaged. I asked him for feedback on it and he said 'I like it, there's nothing I would change about it, it's pretty cool'. I find that a big win.

## Specifications-

- It opens like a chest ✓
- The minimum volume is 5000 mm<sup>3</sup> ✓
- It must look like a rubix cube ✓
- It must fit in the intended environment ✓
- It must interpret the characteristics of my stakeholder ✓
- It can store up to 20 cubes max ✓
- It must be able to be fit for purpose for other stakeholders (just in case) ✓
- Must have a spinning mechanism to it ✓

Overall I think I have done each specification- by using a unique mechanism it can both open like a chest and has a fun twist to it, literally. It does fit in the intended environment, and even better the lid can open inside it. He has put his cubes in the box and it does all fit. Lastly my other stakeholders I had in mind was my other little brother who said he quite liked it alot and my third stakeholder was my cousin. When she saw it she was rather interested in it so even if my primary stakeholder didn't like it, I think my other stakeholders would happily use the container.

## Reflection and Evaluation

In terms of the brief for this project, it was to design a container that would fit 20 rubix cubes and be stored on a shelf in a wardrobe with ease. I wanted to make this so my brother would have a safe spot to store all his rubix cubes so they have a place to belong. The primary brief was to interpret Manaakitanga; I think I have interpreted this because I have shown interest in one of my brothers hobbies and made something that is functionally helpful for him and is aesthetically pleasing to look at and know what is being stored in it.

