




## Needs & Opportunities





Needs and Opportunities Justified: I have the opportunity to possibly save people's lives in the case of State of Emergency.  
 There is a need for me to design and create a innovative outcome for my family because we would be unprepared if we had to be evacuated from our home.

Needs	Opportunities
Need to create an emergency product for people to use in the state of an emergency.	Opportunity to gain new skills.
Work within an authentic context.	To work with new materials.
Need to use the donated materials.	To create an innovative outcome.
Need to research new skills, materials, and resources.	To save people's lives during a state of emergency.
	To challenge myself.

### FABRIC COMPOSITION, STRUCTURE, CHARACTERISTICS, PERFORMANCE PROPERTIES



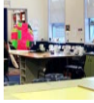

Fabric Composition	Material Structure	Characteristics	Performance properties	Natural or synthetic
-Plastic, foil, and paper that has been laminated together (Aluminium, Propylene) 	Laminated layers of materials.	Shiny, crispy, crinkly, smooth, reflective, thin, opaque, light	Warmth property, waterproof	Synthetic
Double-sided -Stretch spandex -Polyester -Polyurethane 	Woven	Smooth, light, opaque	Waterproof, stretchy	Synthetic
Bark of a Cork Tree 	Bonded+pressed pieces of cork pressed onto a thin material	Smooth, rubbery	Warmth (heat insulation)	Natural

### FABRIC COMPOSITION, STRUCTURE, CHARACTERISTICS, PERFORMANCE PROPERTIES




100% cotton 	Woven (weft and warp)	Light, smooth, flexible	Breathable	Natural
Polythene 	Chemicals/oils because it is plastic	Translucent	Waterproof	Synthetic
Layers of paper 	Laminated (pressed down)	Smooth, stiff, light, opaque	Stability, thickness, durability	Natural
Polyamides, made from chemicals found in coal and petroleum 	Woven	Waxy layer	Waterproof	Synthetic

This table gave me a better understanding of the different compositions, structure, characteristics, and performance properties of different fabrics that make them more or less feasible for use in my outcome. After testing and trialling a range of different materials (vinyl, velvet, nylon, etc.), I concluded that vinyl and velvet had characteristics and performance properties that best met the attributes I needed.

## IMPACT OF TESTING - RESULTS SUMMARY

ATTRIBUTE TO MEET	MATERIAL SELECTED	TECHNIQUE TRIALLED	TEST CARRIED OUT	TEST RESULT - DETAILED	PHOTO EVIDENCE
<p><b>Visible</b> so you can be located by emergency services.</p>	<p>Vinyl (fluro pink and green)</p> 	<p>Tested that the vinyl heat presses securely onto the non-nap side of the colourful velvet that I would be putting it on for my final outcome.</p> 	<p>I made my friend stand at other end of the room and take a photo of my outcome to prove that it was easily visible.</p>	<p>Because I tested the visibility from across the room, it was proven that my fluro pink and green was easily seen. But this outcome was not tested in a dark, outside environment where my outcome could possibly be used in a real life situation so I went into a dark cupboard that imitates the environment and could still see my outcome's bright colours.</p>	 
<p><b>Stakeholder -</b></p> <p>My stakeholder was my friend that I asked to take a photo of my outcome from across the room. We had a conversation after this and she gave me feedback that it my outcome was indeed visible from across the room, meaning I successfully met the attribute.</p> <p>My response: Thank you. I will use vinyl material for the final outcome - it is visible and can be heat pressed.</p>					

## IMPACT OF TESTING - RESULTS SUMMARY

ATTRIBUTE TO MEET	MATERIAL SELECTED	TECHNIQUE TRIALLED	TEST CARRIED OUT	TEST RESULT - DETAILED	PHOTO EVIDENCE
<p><b>Waterproof</b> Keeps items inside the bag dry and protected from water</p>	<p>Vinyl (and velvet)</p> 	<p>Tested both nylon and vinyls supposed waterproofing properties to see which one would be more feasible for my final outcome. I decided that vinyl would better meet the attribute of being waterproof.</p>	<p>I splashed my final outcome (with vinyl on it) with water to imitate the rain that would be in my physical environment of a cyclone.</p>	<p>Because I poured some water on the vinyl protectant on my outcome and because the water ran right off and didn't get into the bag, it was proven that the materials I selected did meet the attribute. But there is a chance that water could get into the bag through the open top so I also tested that the velvet was drop resistant and could reduce the impact of water on my outcome.</p>	 
<p><b>Stakeholder</b></p> <p>I conversed with my end users (my mother) about her opinion of the waterproof attribute. She said it is a great idea for my creation because it would keep everything inside dry. I showed her how the water runs off and she was amazed and thought the vinyl did a great job of keeping water out of my bag</p> <p>My response: Yes the vinyl does work very well which is why I will use it to meet the waterproof attribute.</p>					

### TESTING & TRAILING TECHNIQUES

#### CLOSURE TECHNIQUES:

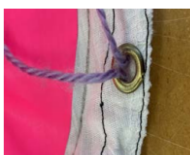
Open ends



Button hole



Grommet



The most **feasible** technique for my outcome is the gold metal grommet **because** it is more aesthetically pleasing than the button hole or leaving the ends unfinished and open. **But**, I may need to consider how durable the grommet is when combined with the fabric **so** when the cord is pulled through quickly in an emergency it doesn't fall apart.

**Stakeholder feedback:** *Test and trial a grommet with iron on interfacing to see if that makes the grommet more durable and stronger when the cord is pulled through the casing quickly. (Teacher)*

**Response:** *I have tested the suggested technique from the teacher and will use iron on interfacing to make the material thicker and more durable, therefore it won't fall apart if its used roughly/quickly in a state of panic.*

#### SEAM TECHNIQUES:

Seam Sealant



Overlocking



**Because** the casing technique I have chosen won't leave exposed edges, it will be bagged out, seam techniques might not be very important aesthetically **But** I do need to consider durability the edges will have the cord rubbing against them quite quickly **so** they would fray easily **so**, the most **feasible** technique for my outcome is overlocking the fabric edge.

**Stakeholder feedback:** *Great to see you've investigated different ways to sew your seams and considered functionality. What will you use to thread through the casing? You might need to test what's the most durable option and what material can handle being pulled quickly in the act of an emergency.*

**Response:** *In my prototypes, I have used yarn and string, and I have also tried one a black cord which is the most durable option.*

**TESTING & TRAILING TECHNIQUES**

**FINISHING TECHNIQUES:**

**Edge stitching**



**Bagging out**



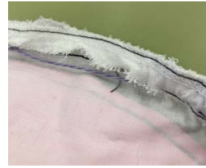
The most **feasible** technique for my outcome is bagging out **because** it creates a better looking finish and looks more aesthetically pleasing and will be more durable than the edge stitching as it does not fray. **But** this technique is a little complicated and I don't have the knowledge of skills to recreate it right now **so** I will ask my teacher for help about how to do this finishing technique.

**Stakeholder feedback:** *Today we went through the "bagging out" technique and how to construct it by using an edge foot on the sewing machine*

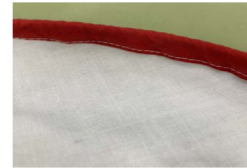
**Response:** *Now I have learned how to bag out a circle and I believe I can recreate this on a larger scale for my final outcome. It looks more aesthetically pleasing and will be more durable*

**CASING TECHNIQUES:**

**Fabric donut**



**Bias tape**



The most **feasible** technique for my outcome is the bias tape **because** it looks much more aesthetically pleasing and will not fall apart and break like the other option. **But** the bias tape is quite thin and might not fit the safety pin and/or cord that I want to use through the casing **so** I will test out whether it fits and then decide if it is a feasible casing technique.

**Stakeholder feedback:** *The bias binding technique does give a good finish, but yes I do agree that it will be difficult to get a safety pin through the casing. The casing is very small. What would be a better option?*

**Response:** *A better option would be to use the bagging out as a casing technique by sewing another line of stitching because I can choose how wide the casing would be while still getting a nice looking finish.*

**TESTING & TRAILING TECHNIQUES**

**Drawstring material**

**Black cord**



**Yarn**



**Twine**



The most **feasible** material to use for my outcome is the black cord **because** it is much more durable than the other options and is strong enough to pull my bag closed roughly/quickly in a state of panic. **But** I would need to test out that this cord pulls through the velvet fabric quickly and smoothly **so** that I know this material will be functional in my final outcome.

**Stakeholder feedback:** *What did you find out after testing the velvet material was there any differences?*

**My response:** *I did a test to see if the black cord pulled through the velvet using a prototype that I had made and it worked, so I will use it for my outcome. It was strong and easy to use.*



**Waterproofing/resisting**

**Vinyl**



**Nylon**



Using the vinyl to make my outcome waterproof/resistant is the most **feasible** technique to use **because** I would be able to easily apply it to my velvet fabric once I've bagged it out. **But**, I haven't tried heat pressing the vinyl onto the velvet yet so I need to test that out **so** that I can be sure that this technique works.

**Stakeholder feedback:** *What did you find out when you heat pressed the velvet and vinyl. Will it stay set together?*

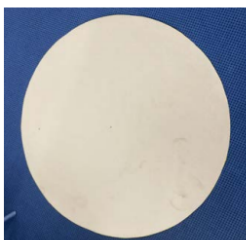
**My response:** *I heat pressed the vinyl onto wrong side because in my outcome I will have the vinyl on the outside and the water-resistant side of the velvet on the inside. It worked well and was really secure.*



**TESTING & TRAILING TECHNIQUES**

**CUTTING & SEWING THE FABRIC CIRCLE**

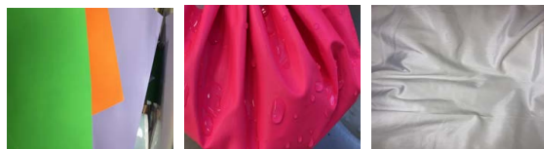
1. Fold (to create casing)
2. Cut (circular shape)
3. Joined materials



I manipulated my material by cutting a circular shape cut from a template. I joined the two materials for the outside and inside by forming a casing and sewing two different materials on top of each other.

**COMBINING THE TWO MATERIALS**

1. Vinyl (used the left overs from the bin)
2. Velvet curtain (used the donated materials to upcycle)



The most **feasible combination** of materials is the velvet curtain **because** it is shower resistant, meaning it could keep out small amounts of rainwater. **But** my design would need to be more water resistant **so** I am heat pressing an outside layer of vinyl onto the curtain to achieve a waterproof material.

**Stakeholder feedback:** *What a great way to combine two different materials to ensure it is a more water resistant material.*

**Response:** *Combining these materials means my outcome will meet the requirement of combining materials and being waterproof/water resistant.*

# Concept Development

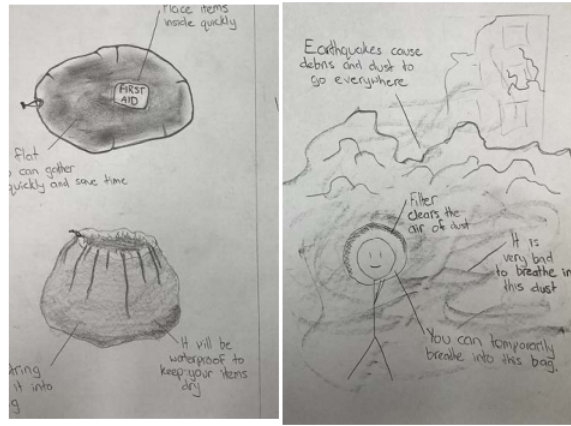
**Stakeholder Feedback:** "I would potentially have it made out of a reflective material so you could use it for other things like be easily found if you were lost or some sort of bright colour so you could lay it out if there was a helicopter looking for you."

"One of the problems is how much can I carry in it. If it's a first aid type emergency exit then it probably would want to be in as much as I can so it'd need to be pretty big but then you gotta be able to carry a lot so you'd want a way to carry it. Preferably hand-free."

"Materials is dry bag material cause it's quite light and really tough. Not the super thin nylon stuff the sort of rubberised canvas stuff."

"If it was waterproof on one side a fluffily lined on the other side that would be a really good blanket."

**My Response:** Okay I will definitely implement the bright colours into my final design. I think backpack straps are a good way to carry it while being hands-free so I will add that to my design. I will think about what you said about the material and I think using vinyl is a great material because it is waterproof AND can be visible. The multifunction that I will use as a blanket is a great idea. I'll have to consider what materials to use.



**Stakeholder Feedback:** "Could covering your mouth and nose only be sufficient that way it can be a smaller thing?"  
"It would be impossible to make though with the materials that you have available."

**My response:** I agree that the constraint of only being able to use the donated materials means that I will not be able to create this product so I will not develop it further.

# Concept Development



**Stakeholder Feedback:** "You'd want waterproof (materials), probably something plastic and non-ripping. Probably pretty thin if you're only putting documents in there—thin but solid enough that it doesn't rip easily. I think this is a good design and would work pretty well."

**My Response:** Yes the attributes of the materials would need to be similar to those and I believe there are materials in the pile of donated goods that could be used to meet those attributes.

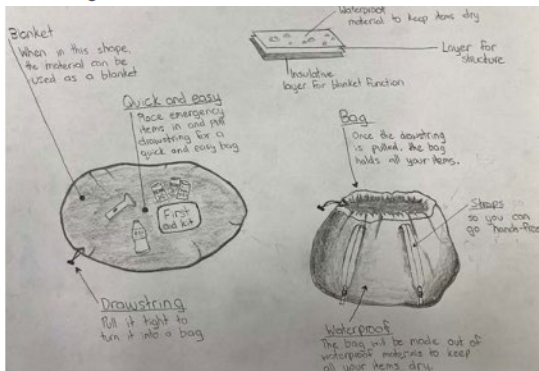


**Stakeholder Feedback:** "My change to the concept would be one sleeping bag each because I don't know if everybody would want to be in one big sleeping bag. I would have individual sleeping bags that you can zip together so instead of one big one you can make it little normal sized ones or one big one depending on what you want."

"The best stuff I'd make it out of would be rip-stop nylon with goose feather."

"Depending on the situation you'd want it reasonably bright coloured. If it's just a waterproof bag that would be more important."

**My Response:** My time restraint makes it unreasonable to try to create 5 different sleeping bags for my 5 end users and it would also use an unnecessary amount of materials. Goose feather is definitely not available for me as I can only use the donated materials. Both these restraints make this concept a bad choice so I will not develop this idea.



## OVERALL DECISION

After investigating materials and techniques I have refined my idea and decided the most feasible design idea is Concept 1 because it solves the issue of my end users. I have a family of 5 and with concept 1 it is more fit for purpose because it can hold larger and more items for everyone to keep safe in comparison to concept 2 which is much small and fiddly to use. I used my investigations and feedback to decide that I will combine off cuts of vinyl and scrap velvet material from the donated goods pile to ensure I am being sustainable in class.

I will manipulate my materials by cutting, joining and shaping two materials by bagging out or creating a casing.

The performance properties of the chosen materials are water resistant (vinyl) and insulating (velvet). The composition of my material is made up of a combination of brightly coloured vinyl and velvet which is heat set together and to change the structure making it thicker and durable. The outcome will be suitable for the physical environment because it will be easy to access for all members of my family hanging by the drawstring by the door.

The characteristics of concept 1 is more visible because of the bright pink and green colours which could be identified easier by a rescue team.

**Stakeholder feedback | Whānau**

"Looks like it would hold a lot of stuff and does that in a smart way. Easy to carry -hands free which is good if there are children that need to be held, phones for navigation, etc. Vinyl is a good choice for waterproofing were we to be stuck outside in the rain."

**PROPERTIES**

- Insulative
- Waterproof
- Multi Purpose
- Durable

**CHARACTERISTICS**

- Bright
- Round
- Large



**Outcome justification**

Specification	Met Y/N	Explanation/Justification
Round ( <i>A circular shape is the most feasible shape to pull a drawstring</i> )	Yes	My outcome is as circular as possible (1 metre diameter all the way round)
Bright / Visible ( <i>so you can be located by emergency services</i> )	Yes	Fluro pink and green pieces of vinyl heat pressed in a patchwork on the outside of my bag
Waterproof ( <i>Keeps items inside the bag dry and protected from water</i> )	Yes	I combined the materials of velvet and vinyl to make my outcome drop resistant on the inside (velvet nap) and waterproof on the outside (vinyl)
Size ( <i>Must be large enough to hold all the emergency items for a family of 5 and to be functional as a blanket</i> )	Yes	1 metre in diameter. 0.8 m <sup>2</sup> area of blanket. Will be large enough to fit emergency items (tested for proof). Circumference= 3.14m
Recycled materials ( <i>To reduce waste of materials in the hope to show kaitiakitanga and preserve the environment for future generations</i> )	Yes	All materials used to create my outcome were recycled/donated materials by teachers at Otumoetai College, for example an old velvet curtain. Also used vinyl from the scrap bin that would have been thrown out otherwise.
CPR instructions ( <i>to inform people in case they need that knowledge in an emergency situation</i> )	Yes	Vinyl pressed CPR instructions for adults, children, and infants on the white vinyl on the inside of my bag so it can be read.

**Outcome justification Continued**

Casing ( <i>must be wide enough for my cord to pull through+must be functional in the environment</i> )	Yes	My casing is 1.5cm wide and I have tested to prove that it is functional.
Grommets ( <i>must be functional to allow the cord to pull through+be durable</i> )	Yes	2 gold grommets with a hole that is 0.8cm wide. Tested to ensure that the cord pulls through quickly and easily.
Cord ( <i>must be long enough to be feasible in my outcome</i> )	Yes	Round black cord 5mm wide + 4.43 metres of cord total.
Must be fit for purpose ( <i>must be durable+large enough and fit the required attributes that would make it suitable</i> )	Yes	Cannot test it in the physical environment of a cyclone but have tried splashing water on it to ensure it is suitable enough. See above for other attributes that would make it suitable.
Finished in allocated time ( <i>done by the due date</i> )	Yes	1 term allocated to finish outcome and I finished in 8 weeks.
Completed to the best of my abilities ( <i>ensures the outcome is finished as well as I can make it</i> )	Yes	Unpicked a stitch when I wasn't satisfied with it. Used a walking foot to stop fabric bunching.
Suitable for end users ( <i>users can use my outcome</i> )	Yes	Let my end users (immediate family) try out my outcome and they can use it well.
Must combine materials ( <i>brings two or more materials together to form a new material</i> )	Yes	I combined the materials velvet and vinyl using a heat press. The new materials has a different composition and structure.

**Final Brief**

I had the opportunity to design and create an emergency drawstring bag that will allow them to quickly and easily gather important items if we were to go into a state of emergency during a natural disaster. The bag is circular 1 metre in diameter. It is covered in fluro pink and green vinyl to make it visible and waterproof at the same time. I designed it to combine the vinyl with a velvet lining so my outcome has a multifunction to be used as a blanket for my immediate family (Mum, Dad, Sister, Brother).

My emergency drawstring bag will be stored in an easily accessible location in my house so my family members could grab the bag and fill it quickly. It could be used during multiple natural disasters but specifically a cyclone would be the most likely for where I live.

An emergency bag would be useful because you could quickly gather your necessary survival items and get to a safe place.