

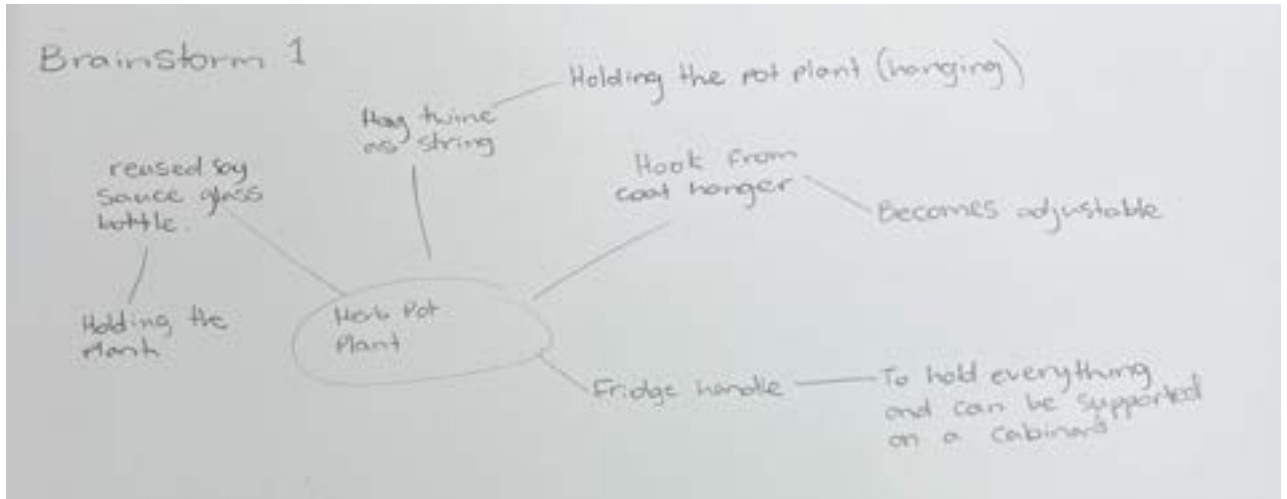
Sustainability Portfolio Project Proposal

Darcy Ballentine Year 11

Time Amount: Week 5 (Term 2) - Week 6 (Term 3)

Identification and explorations of the need




Brainstorming 1:



Evaluation And Justification:

- As a starting point for my project I would like to use some sort of glass bottle that can be reused into hanging plants from ceilings and or be used as light bulbs as a centre point in a kitchen.

Mind map from Brainstorm 1:

	<p>I was thinking of using some glass bottles to hold the plant.</p>
	<p>I had some ideas around hanging the glass bottle on some rope/string.</p>
	<p>Utilising baling twine as it ends up in a major landfill.</p>
	<p>I was thinking of adding plants into the glass bottles eg: herbs for the kitchen.</p>
	<p>Using a fridge handle to hold and support the pot plant.</p>

Evaluation of mind map 1

- My initial concept for a sustainable project is to create a reusable pot plant for herbs in a kitchen. Using materials from landfill like, soy sauce glass bottles were used to support the plant hanging on bale twine that was repurposed and fastened to a metal bar.

Conclusion and justification

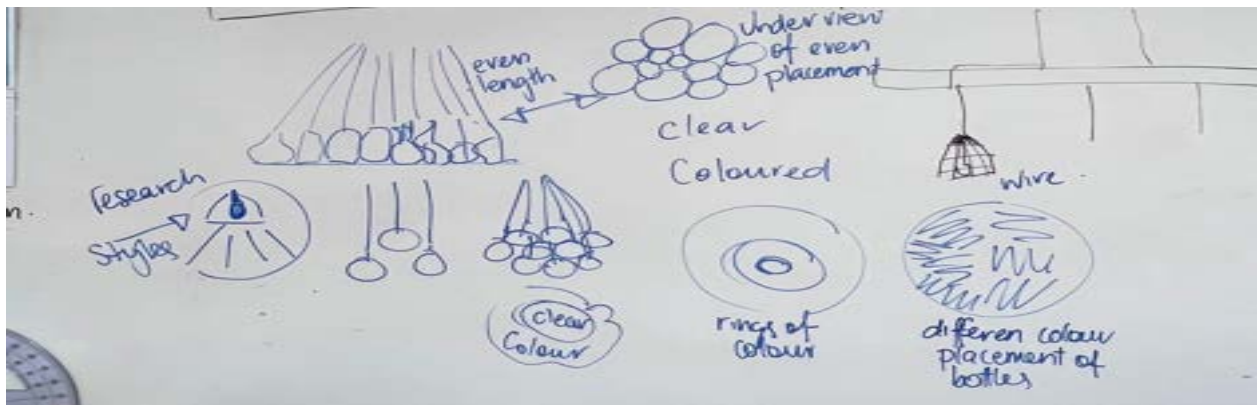
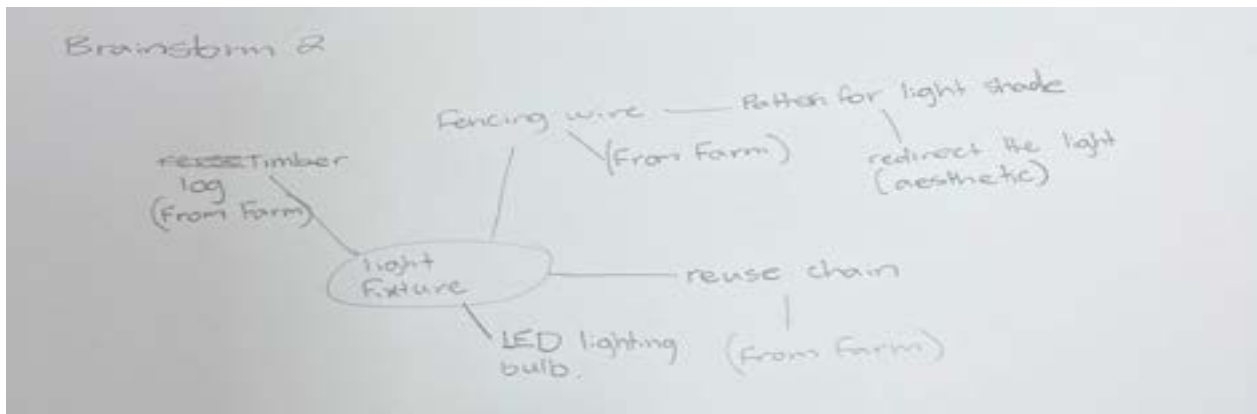
- However, I do believe that this design idea will be too simple for a 10 week project due to just attaching everything together rather than making a more unique item or luxurious piece. I believe I can gather a more complex idea. So I decided to jot some new ideas down on a second brainstorm listed below.

Identification

Initial ideas

- Some ideas that spark my interest are to see a functioning light fixture
- I would like to see a rustic/country/ farming **aesthetic** due to an idea of **reusing** farming materials that would otherwise be wasted and junked. This was my new **target** for sustainability for my project.
- As a result, my **target market** would be individuals of adult age who live in rural or isolated places and have some country/land. Understanding the history and significance of all the repurposed items I may employ creates a significant **symbol/centrepiece** for their house to reflect the **characteristics** of how they live.

Brainstorm of new design:



Evaluation And Justification:

- My second idea for my design project was to create some ideas around developing my skills towards making a light fixture inspired by the soy sauce glass bottle in the shape of a light bulb being suspended from a bar. I may consider sustainable resources like timber, fencing wire and chains. And reduce electricity use by investigating an types of light bulbs. However, the problem with using some light bulb is that it can be extremely damaging to the eyes if the bulb is not covered by a shade, so that's something I will have to do some research and investigation on.
In conclusion, I really like this idea of designing a light fixture, because it appears to be more suitable for the time and subject of my assessment.

Mind Map From Brainstorm 2:



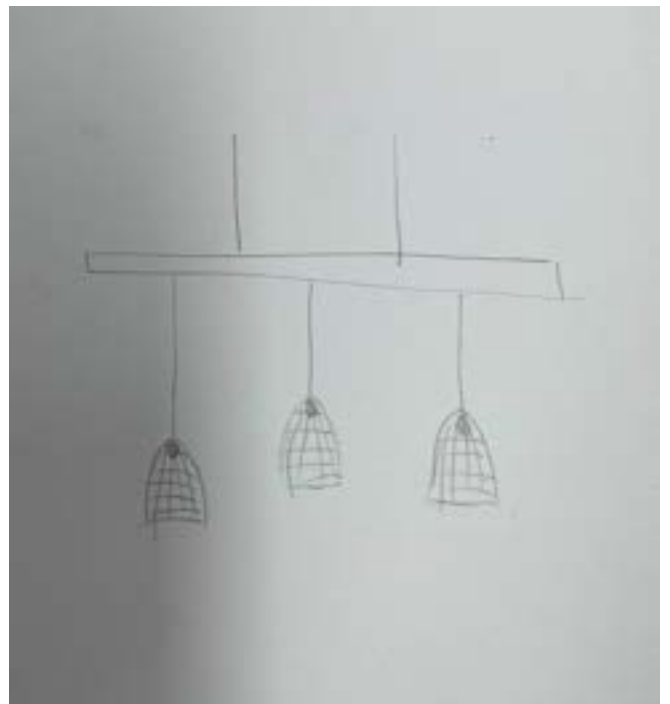
Evaluation of Mind Map 2:

- In my next idea I chose to go more complex than my other design. I include reused products/resources from scrap metal on my farm. I would like to see a fixed fixture/chandelier.


Rough sketch Of Design 2:

Annotate

- This first drawing combines all of my thoughts on a single sheet of paper. I like how the lights aren't level as I have explored the Principle of design using asymmetry to create more interest within the design than having lines of lights all equal to each other, yet still allowing to keep my design still appealingly balanced. Creating more of a rugged country look and giving the image more individuality and character.



SWOT Analysis

images / idea	Strengths	Weaknesses	Opportunities	Threats
	<p>The strength is environmentally friendly with a high concept of repurposing. Resulting in less consumption of materials when in production stages.</p>	<p>I have very little skills and experience in wiring electrical wires for the lighting of the product.</p> <p>Making it styling rather than just be a “found object project”</p>	<p>It has a unique market possibility since it is a sustainable project that can be used as a focal point in a space.</p> <p>To make something unique</p> <p>A clever design to explore many styles.</p>	<p>Due to the light fixture needing to be installed onto higher 10-12 foot ceilings. This is decreasing my target market.</p> <p>Higher skill level</p>

Brief

I intend to see a fully working and successful light fixture. Utilising reusable resources and environmentally friendly materials to encourage the concept of sustainability.

Existing design ideas:

Existing design 1)

Pros

- I do like that the light fixture is aesthetically appealing with the lights and wires wrapped around the slab of timber.
- I like the use of reusable materials, eg: chain, timber.
- I like the structural integrity of the chains supporting the log.



Cons

- Lots of lighting, may result in a strong use of energy consumption
- Depending on the choice of light bulb, it could result in damaging eyes if exposed.
- Very heavy and can be hard to assemble

Existing design 2)

Pros

- I like the idea of reusing wire acting as the light shade. Aesthetically appealing.
- Like the stained colour or type of timber chosen

Cons

- Depending on the lumens of the light, I dislike how the light shade does not shade the bulb, which might be hazardous to the eyes if exposed.
- Looks very simple



Existing design 3)

Pros

- I like the line of lights
- The beam being supported to the ceiling by the rusty chains.

Cons

- Seems extremely bright due to no light shade
- Looks very simple.



Evaluation and justification:

- These images covered most of my original ideas on reusing materials like the chain and timber, including the structural support of the chain holding the timber. And the aesthetic I was looking to achieve. Also covers the structural integrity of the design

Criteria to evaluate success

Criteria	Analysis	How it will be assessed
<p>Functionality</p>	<ul style="list-style-type: none"> - My design is efficient and effective, establishing the mood with dimmed lighting throughout the appropriate surrounding area of a dining room to create shadows and silhouettes of the light shades that create a sense of restfulness and comfort while sitting. - The fixture is appropriate for the ceiling height which is around 10-12 foot ceilings so that the chandelier is able to hang freely with no concerns of being damaged or hit if too low. If this is unable to be achieved it would result in the product being deemed unusable or impractical which is limiting my target market to those who own higher ceilings in their home otherwise it can be used. 	<p>This can be assessed by a 3rd party</p> <ul style="list-style-type: none"> - Family /clients - Electrician
<p>Quality and durability</p> <ul style="list-style-type: none"> - Safety for the consumer 	<ul style="list-style-type: none"> - Due to the sharpness of the steel wiring for the lamp shade, they need to be appropriate not only for the aesthetics, but for the safety of the consumer. Ensuring that there is no wire sticking out or in contact with live wires to acknowledge the hazardous concerns of being cut when installing and electrocuted. - The chaining for the electrical wire to thread through up to the ceiling is to be durable and good quality due to the concerns of weight that may damage the product or ceiling causing concerns of the ceiling collapsing and risk of electrocution. - The quality of the wiring is to be successfully weired in correctly and safely to ensure a good 	<p>This can be inspected by a 3rd party evaluator.</p> <ul style="list-style-type: none"> - Electrician for earthing wires - Teacher - Builder

	<p>quality, safe, and successful design. Therefore, to ensure there is no risk of electrocution</p> <ul style="list-style-type: none"> - For the safety of the consumer, my design will have to be fixed securely to the ceiling so there is no risk of damage to the property. - For the safety of the consumer's eyes due to utilising a bright LED light, my design must include a light shade that works correctly not only aesthetically but for the safety of the individual to avoid the risk of eye damage. - Live electrical wires are to be not exposed and or under heavy weight strain, to ensure there is no risk of electrocution. This could result in negative impacts if not investigated correctly which can develop sparking and taring of wire cording due to straint of weight. Impact on environment and Impact on individuals. Therefore, this can be deemed unsafe for the consumer if not wired or made correctly. Ensuring that the wires are earthed and supported correctly. 	
<p>Aesthetics</p> <ul style="list-style-type: none"> - Style to appeal to Target Market - Finish is high quality 	<ul style="list-style-type: none"> - All the reusable resources applied to my design must complement each other well, developing an earthy, rusty look/finish aesthetic to suit the country's rustic target market to create a centrepiece. - The product must be completed to an excellent level, whether it is an oil finish for wood or threading of wire with no gaps that is aesthetically pleasing to the target market. This can result in the design being more aesthetically pleasing to the target market also giving the timber a more premium feel 	<p>This can be assessed by a professional 3rd party evaluator.</p> <ul style="list-style-type: none"> - Teacher - Electrician

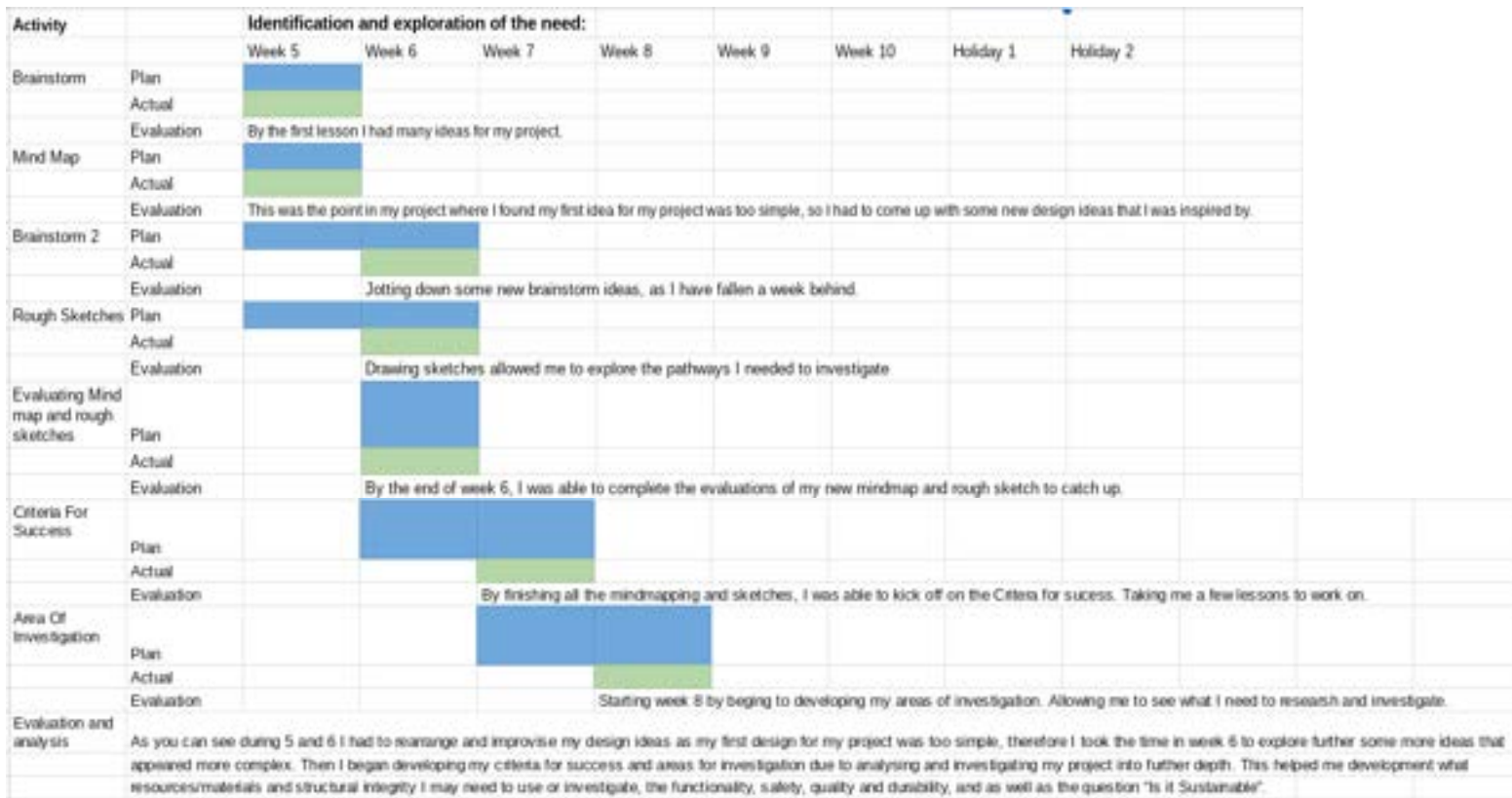
	which can result in prices to increase for better quality.	
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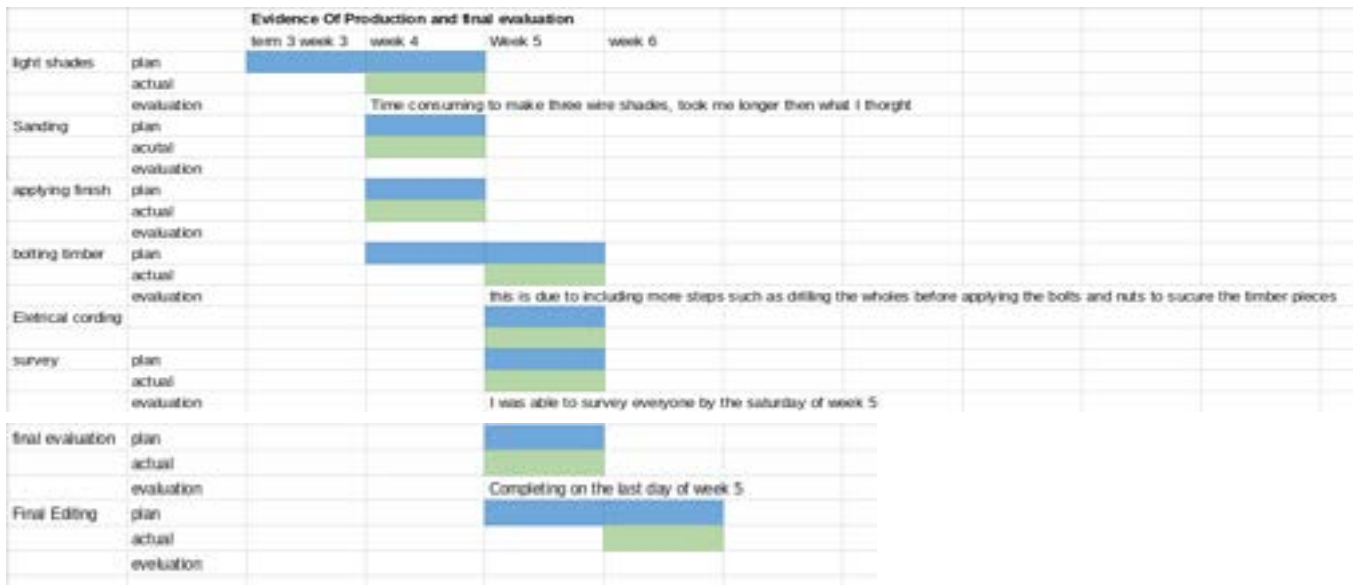
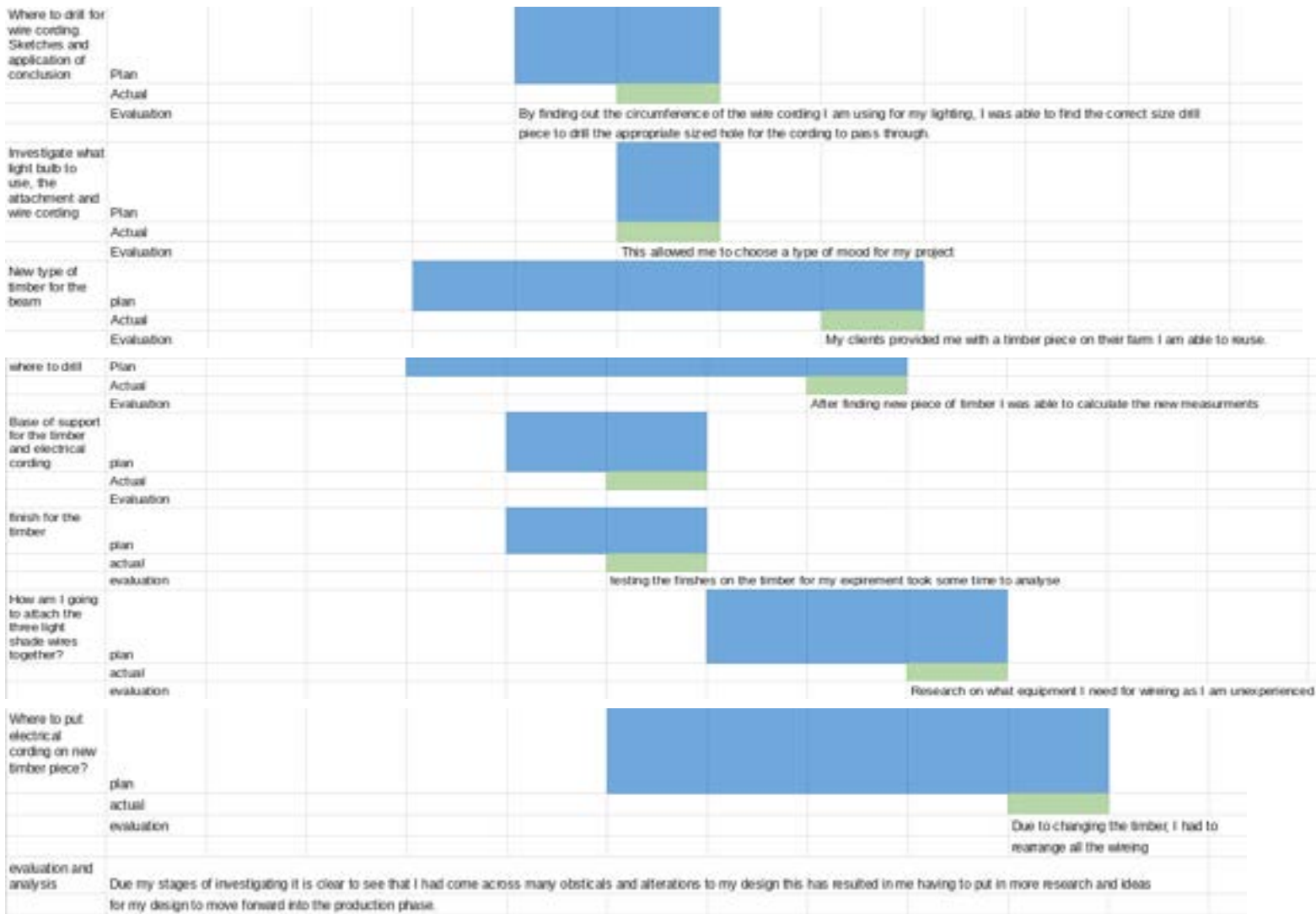
Areas of Investigation

Category	Explained	How it will be investigated
What material will I use for my light shade	Explore the aesthetic appeal and how does it affect the distribution of light	<ul style="list-style-type: none"> - Internet - Experiments with found objects - Target market feedback
Development of ideas on light shades	What material options and how will it be assembled	<ul style="list-style-type: none"> - Research types of patterns or weaving of material. - Existing designs - youtube - Experiments
Investigate what light bulb to use, the attachment, and thickness of wire cording	To ensure that the light shade is secured to the light bulb attachment. As Well as the wire cording is appropriate for my design and is able to hold/support the weight of the attachment and light shade.	<ul style="list-style-type: none"> - Research types of attachments and types of bulbs - Research lighting tones (brightness) - LED light - Expert- interviewing electrician - Search home property for found objects to light shade attachment - Visit in store and investigate the range of attachments. - Bunnings - Electrician - Youtube

Type of timber material for the beam	Wood/timber <ul style="list-style-type: none"> - Investigate strengths and support - aesthetics - Style - Size - Weight 	Research types of timbers <ul style="list-style-type: none"> - Internet - Visit store
Where to drill wood	How to be safe <ul style="list-style-type: none"> - Ways to prevent injury when utilising tools 	<ul style="list-style-type: none"> - Teacher - Youtube - Expert
Base of support for the timer and wire cording	How am I going do find a support system for the timber beam and wire cording	Teacher Builder approval Internet
Hardware <ul style="list-style-type: none"> - How to attach wire to beam. 	How am I going to fix it to the ceiling	Research <ul style="list-style-type: none"> - Internet - Bunnings - Electrician
finish for the timber	Explore finishes that fit my aesthetic and sustainable criteria.	<ul style="list-style-type: none"> - Testing spot of different finishes on the material to evaluate - experiment - Investigate the types of finish and if the finish is eco friendly for the material.
Technical plan measurements	<ul style="list-style-type: none"> - Detailed sketch 	<ul style="list-style-type: none"> - Teacher assistants - Ways of presenting

GANTT Chart





Finance Plan

Item	Unit cost	N#	Estimated Cost	Actual Cost
Tasmanian Oak dowel from bunnings warehouse	\$41.20 each <u>RETURNED</u>	1	\$40.00 <u>RETURNED</u>	\$41.20 <u>RETURNED</u>
Chain	\$0.00 Reused		\$0.00	\$0.00
Bolts, washers, nuts	\$0.00 Reused		\$0.00 Reused	\$0.00
Steel Wire	\$0.00 Reused		\$0.00	\$0.00
Electrical cording and light bulb attachment	\$42.90 each	3	\$120.00	\$128.70
Cable clips (black)	\$3.08 for pack of 20	1 pack	\$3.00	\$3.08
Junction box	\$6.12	1	\$6.00	\$6.12
Tinted Beeswax	Supported by school		Supported by school	\$0.00
Total= \$137.90				

Receipts



Project Development

Factors affecting design

- Sustainability is a significant factor in influencing the design direction of my project specifically exploring the notion of reusability.

Therefore, the sustainability component for my design consists of repurposing materials and resources from my farm that would otherwise be thrown to waste/landfill. When you throw away metals, they can release toxins into the environment. The toxins from these metals are often released into the air and soil, where they can reach farmland and enter the food chain. Therefore, I am giving new life to materials that have outlived their usefulness and are now regarded as unusable in current farming practices. By reusing these resources and material it results in reduction of landfill and emission in the manufacturing of my product stage because I'm not using resources with harmful chemicals, and welding materials. I'm simply refurbishing it and turning it into a product that is aesthetically appealing and functional thereby extending the object's life phase.

The quality of my light fixture consists of refurbished materials that are still in good condition and will be constructed with attention to detail, especially in the polish, sanding of the timber and precision in the bending and folding of the wire for the light shades. To ensure that my product is of the highest quality. Because reused materials are used they are often left damaged or messy due to the material not serving its purpose, therefore it is critical that finalising must be excellent to avoid the product seeming or being perceived as a trash craft rather than an intelligent design choice. This ensures that my product fulfils my aesthetic and safety requirements in order to gain a position in my selected target market.


This then ties into the aesthetic concept of the light fixture in the target market who enjoy the theme or character of a rural rustic look for a centrepiece over their dining table. The quality of my design influences the final outcome of the aesthetic ensuring that the design is built well and there are no concerns or damage being done resulting in potentially losing the aesthetic. This can result in the product not being appropriate or aesthetically appealing for my target market. Rustic agricultural equipment that may be presented as art pieces in a home, obtaining significance from the harsh characteristics of farming conditions, are the target market trends for a rural location. As the lighting fixture is visibly a significant piece within the dining space, it also has a powerful impact on the mood or tone of lighting to set the scene of the dining area with the use of focus points to draw attention to the statement piece that reflects the style and personality of the space, which is crucial to get correct for my clients needs.


In conclusion, sustainability is at the core of my project, driving the design direction and ensuring the reusability of materials from my farm. By repurposing these materials, I not only reduce landfill waste but also minimise the release of harmful toxins into the environment. Additionally, my commitment to quality ensures that my light fixture is both aesthetically appealing and safe for use. The design concept aligns with the rustic charm sought by my target market in rural settings, adding significance to their homes through the use of agricultural equipment as art pieces. By strategically placing focus points, I create a dining area that reflects the style and personality of the space, meeting the specific needs of my clients.

Evidence of creativity and investigation

- What material will I use for my light shade?

I've found that the main material on the farm where I live contains a lot of used and aged fencing wire, which has resulted in being dumped and left to landfill to harm our environment and our animals. This is why I would wish to utilise this forgotten trashed material to reuse, refurbish and develop a new product.


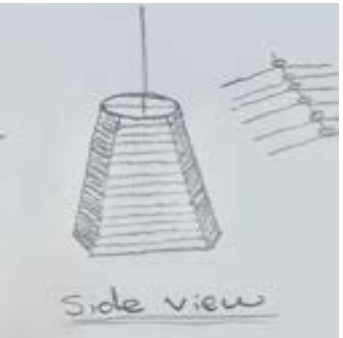
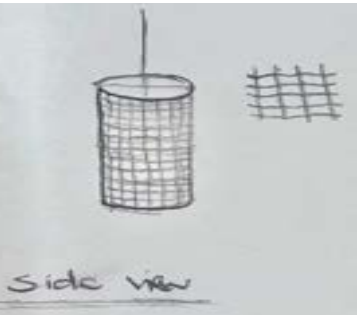
Material for base structure/frame of light shade. Type of wire	Features/use	conclusion
 2.5mm thick (fencing wire)	<p><u>Strong for structural integrity</u>, while still being able to mould and shape for a durable light shade frame.</p>	<p>The thickness of the wire is perfect for bending, as well as being able to hold structural integrity of its shape acting as a strong base frame for my light shade.</p>

Material for creating the light shade	Features/use	conclusion
	<p>2.00mm thin wire</p> <ul style="list-style-type: none"> - Great for shaping and moulding in further and precise detail - Difficult to work with 	<p>This type and thickness of wire is perfect for being able to develop a highly precise and good quality design on a light shade due to the flexibility of the steel wire.</p>

Application of conclusion

- For the base frame I will use the “scap” 2.5mm thick steel wire.
The 2mm will be used for wire weaving

- **Development of ideas on light shade**

Sketch of light shade	Features
<p style="text-align: right;">1</p> 	<p>Pros</p> <ul style="list-style-type: none"> - I like how the design curves providing dimension - I like the weaving design <p>Cons</p> <ul style="list-style-type: none"> - Spaces in between each wire might be too far apart affecting the distribution of the lighting for my aesthetic.
<p style="text-align: right;">2</p> 	<p>Pros</p> <ul style="list-style-type: none"> - I really like this design because it adds a different type of texture to the corners when altering the weave aesthetic <p>Cons</p> <ul style="list-style-type: none"> - The design seems quite simple and generic, yet the threading and weaving of the wire makes the design more complex and thought through.
<p style="text-align: right;">3</p> 	<p>Pros</p> <ul style="list-style-type: none"> - I do like the cylinder design <p>I like the tightness of the weaving</p> <p>Cons</p> <ul style="list-style-type: none"> - May be concerned for the amount of light the shade produces due to the wiring being tightly woven. Resulting in less light, more weight due to the use of more material for the tighter weave.

Application of conclusion

- I have come to the conclusion that I really like the second design the most due to the loops that are created by the weaving of wire and will suit my target market of aesthetics. **However**, unfortunately I have discovered that the thin wire is a very limited material on my farm and will be difficult and time consuming to complete. This may result in the production being rushed, developing a poorly built product due to time and standards not being met for my chosen aesthetic. This may deem my product unusable, unsafe and incomplete. Therefore, I have chosen to go back to the drawing board for my new light shade design and look for materials that are more accessible for my project.

- Mind map of materials for development of a new light shade design

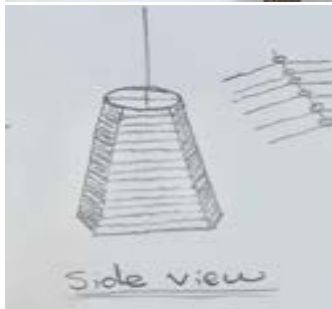
Most popular material that has been used for its purpose and is now wasted:




Existing designs



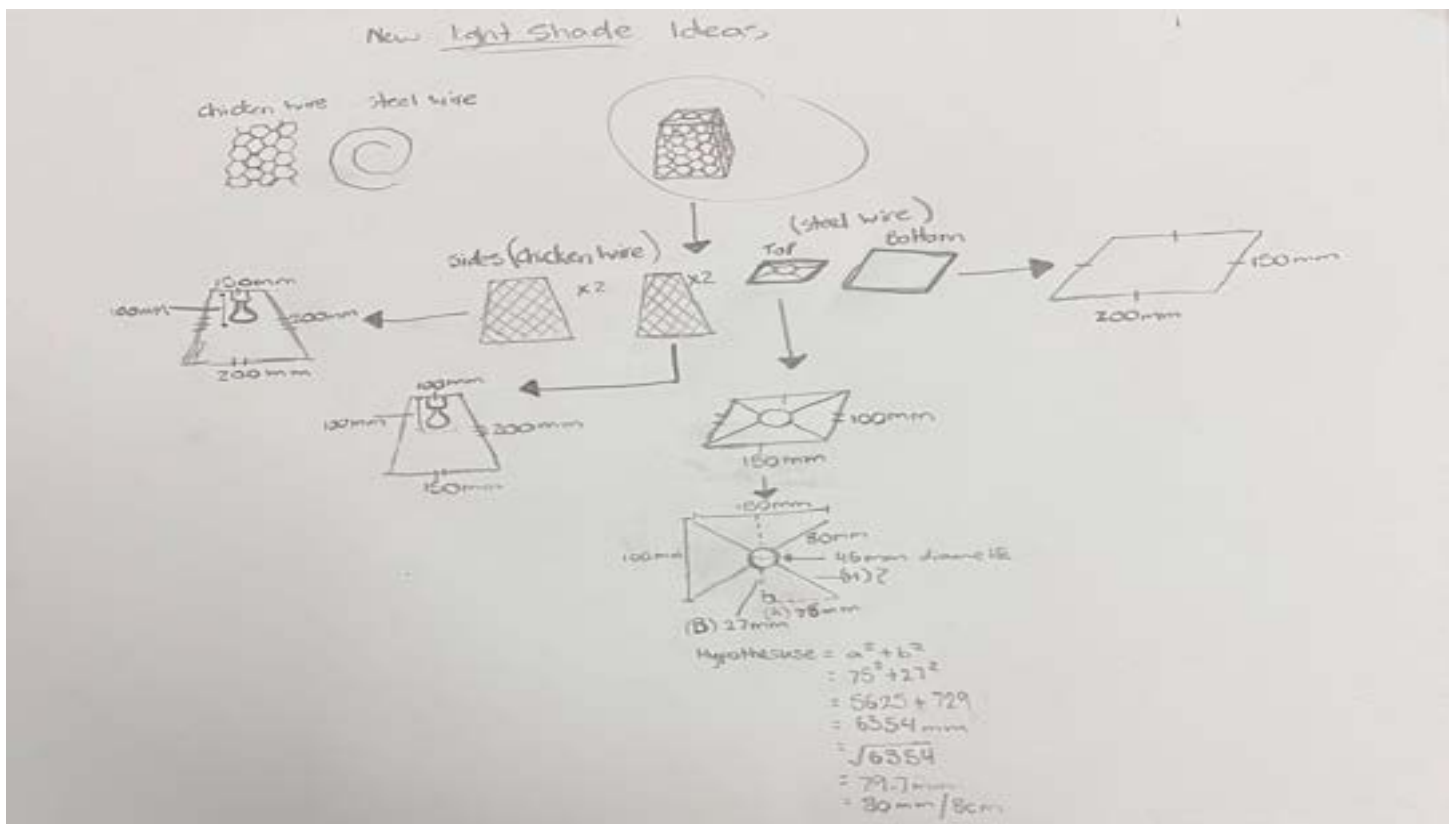
This image was one of the second existing designs I looked at for the previous light shade and is a great way to get some ideas around how im going to present and work with this reused material of chicken wire that is appropriate for the consumers aesthetic and safety.



I still want to use my existing skills and develop a new design off my own light shade drawing since I enjoy the shape. While still maintaining the structural shape of the design utilising reused fencing wire, however I will change the thin wire to the reused chicken wire.

Material	Features
<p>Chicken coop wire</p> 	<p>Pros</p> <ul style="list-style-type: none"> - Much easier to work with compared to the thin steel wire - More access to this type of material on my farm to reuse. - The generic shape of the wire is great for my target market of aesthetics as this is a very popular material that is used for fencing on country farms, therefore this type of wire has more meaning and understanding of who my target market is persuaded too. - Complement the rustic aesthetic I'm after. <p>Cons</p> <ul style="list-style-type: none"> - Can't make a unique design as there is already a pattern made

Measured sketch of new light shade design

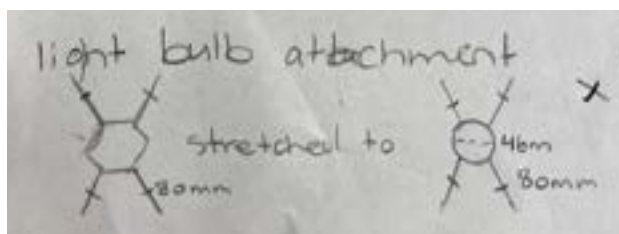


Justification and client discussion 7th July

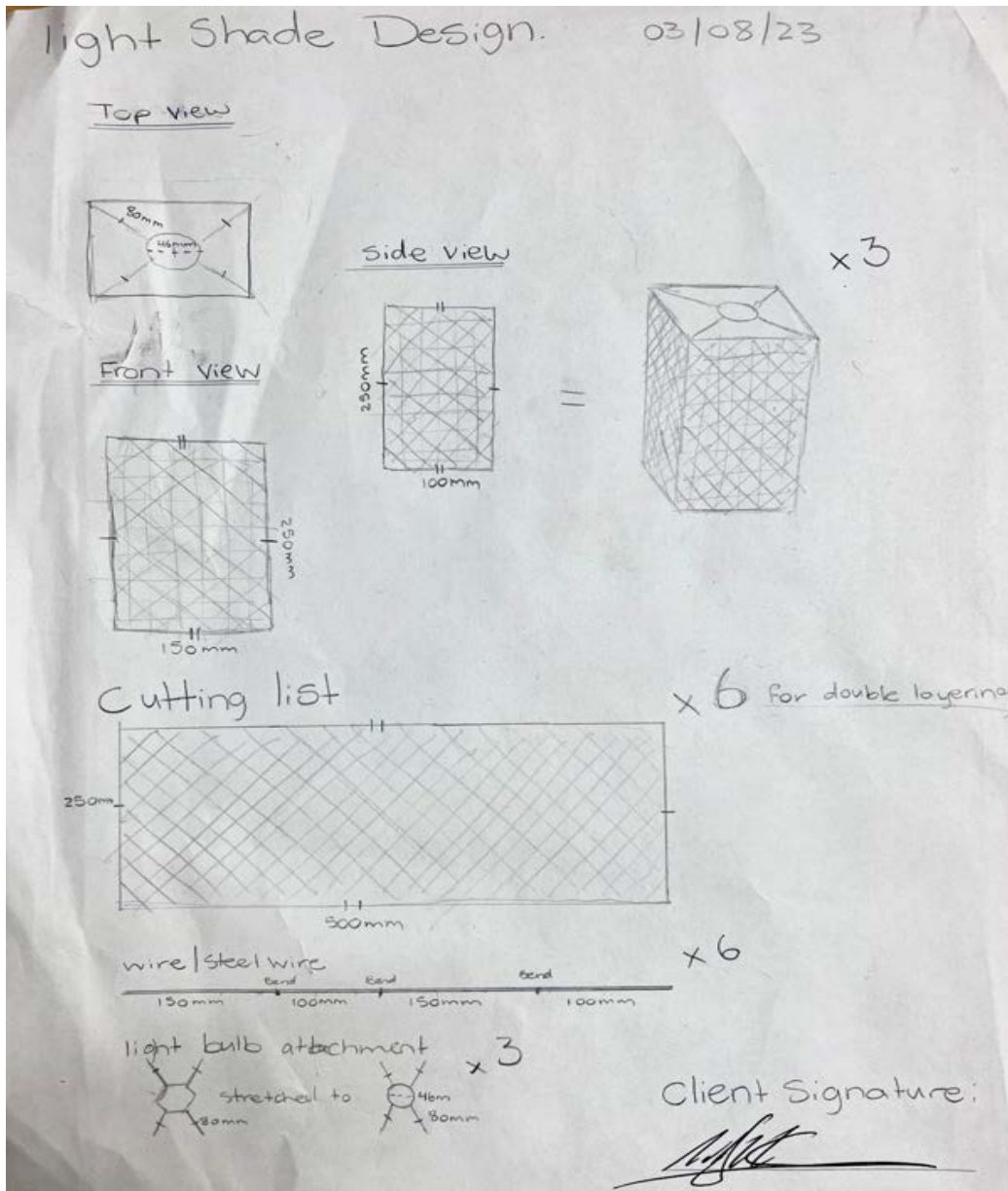
- I showed my measured sketch of the light shades to my clients. They did like it, however they did only have a little concern about whether the shades would be hitting each other due to their trapezoid shape. Therefore they explained to me some more thoughts and ideas while still utilising the same material.

What Went Well (WWW)

- The measurement of each hexagon in the wire pattern turned out to be the perfect size of attachment to the light bulb and cording. Therefore this technique will be incorporated in the next design.



Altered light shade design to show clients



Light distribution experiment

Aim- to see how light is distributed through the chicken wire layers

Method- Cut a sample piece of chicken wire and place in front of lighting and compare

Results:

1 chicken wire layer

image :



Conclusion

- I like the look of the silhouette of the octagon structure of the wire generating a really amazing pattern when light flows through the wire, which pairs well with my chosen aesthetic of rustic rough country. However, due to having only one layer with a large shaped pattern creates some concerns for the light possibly being exposed too much due to less material which can result in damage to eyes and also look very open and simply made appearing as quite a simple light shade

2 chicken wire layers

Image:



Conclusion

- I like the appearance of incorporating two layers of chicken coop wire since it saves more material being wasted while also providing a thicker and more distinctive pattern when light shines through it. It also fits in perfectly with my chosen style. Using two layers will make the light shade stand out, providing more of an interesting piece.

Application of Conclusion:

At the end of my experiment of exploring layering and how the amount of wire affects the light distribution, this has allowed me to see how many layers will look best for my product. Therefore, I have chosen to go with two layers of chicken coop wire as it provides more of a unique look while still providing its purpose and function of a light shade.

Client discussion and approval July 23rd:

They really liked how the two layers looked, allowing the shade to reveal more of its shape and durability.


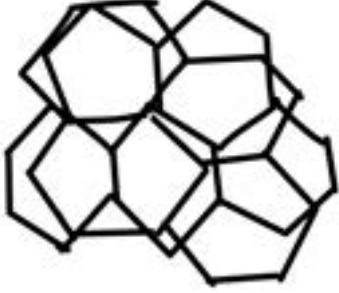

Wire Positioning

I showed these rough images of the types of wire positioning I am able to offer.

Experiment

Aim - I would like to explore the various types of wire displacement/positioning

Method - Draw some strategies on wire positions.





Option 1	Option 2	Option 3
		
<p>Analysis/results</p> <ul style="list-style-type: none"> - Full overlap - Developed lots of smaller shapes and will create a nice silhouette effect. 	<p>Analysis/results</p> <ul style="list-style-type: none"> - Chicken wire is rotated 90 degrees - Looks messy and out of place 	<p>Analysis/results</p> <ul style="list-style-type: none"> - Slightly put to the right - I noticed this technique developed a really cool pattern. However there are heaps of open spaces that allow a lot of light to go through, possibly damaging the eyes.

Client discussion August 4th:

- My client preferred option 1 since the wire remained balanced while still sealing the open hexagons with the incorporation of two layers.

Types of lighting





Tone	Mood	Image
Harsh and glaring lighting	harsh lighting that can create uncomfortable glare or shadows. It can make the dining space look uninviting and uncomfortable.	
Too dim lighting	While a dim and cosy atmosphere can be desirable, avoid extremely dim lighting that hinders visibility and makes it difficult to enjoy meals or engage in conversations.	
Coloured lighting	Too much colour in the dining space can be distracting and take away from the overall dining experience. It can be difficult for people to focus on their food and conversation if there are constantly changing lights and colours around them.	
Warm ambient lighting	Ambient lighting in a dining room creates a warmer, inviting atmosphere for meals. diffused light adds depth and creates a cosy ambiance/environment.	

Application of conclusion

- Therefore my clients have chosen to go with the ambience warm lighting for the setting in the dining room.


- Investigate what light bulb to use, the attachment, and thickness of wire cording

Light bulb/globes	Analysis
 <p>LED light bulb (white cool light)</p>	<p>Pros</p> <ul style="list-style-type: none"> - High energy efficiency - 75% less energy being produced than other bulbs. - Last up to 25 times longer than other bulbs on the market. - Brightest light bulb for the same amount of watts <p>Cons</p> <ul style="list-style-type: none"> - LED lights can be so bright that they can be damaging to the eyes if the globe is not installed correctly without a light shade. Due to the LED brightness, I believe that it would be too bright and affect my overall aesthetic.
 <p>LED light bulb (Warm Lighting)</p>	<p>Pros</p> <ul style="list-style-type: none"> - High energy efficiency - 75% less energy being produced than other bulbs. - Last up to 25 times longer than other bulbs on the market. - Warm tone of colour matches my aesthetic. I am looking for creating a warm and inviting environment. <p>Cons</p> <ul style="list-style-type: none"> - These bulbs can reach very dark tones of brightness which can affect the lighting of the surrounding environment. Therefore I will have to consider what type of lumen/Watt I am after.


Application of conclusion

- By looking at these images, the warm lighting LED light bulb appears to be the best on the market for being sustainable in its energy consumption compared to other standard globes. I also really like the warm tone of colour that is produced, resulting in the appropriateness of my chosen target market.

Light bulb attachment

Type of attachment	Features
 <p> pendant light suspension Screw In (bronze attachment) Andy Cord by Brilliant https://www.bunnings.com.au/brilliant-1-8m-antique-bronze-andy-cord-pendant-suspension-kit_p7071322 </p>	<ul style="list-style-type: none"> - Bronze attachment provides more of a rustic weathered look and will pair with my chosen aesthetic really well. - Due to the attachment being a screw in, this provides more of a old aesthetic complementing really well with the bronze worn rustic colour and the warm tone LED lighting - Price \$42.90 each

Thickness of wire cording

Image of wire cording	Features
 <p> Gloss black electrical wire cording </p>	<p>Size</p> <ul style="list-style-type: none"> - 6mm diameter, 20 mm circumference - 1800mm in length, perfect length for my chosen pendant. - This cord will be thick enough to support the weight of the pendant. <p>Wires</p> <ul style="list-style-type: none"> - Hot + Neutral + Ground wires - The ground also known as earth wire offers an additional path for the electrical circuit to flow into the earth so as to not endanger anyone working with the electricity nearby in the event of a short circuit. Without ground wire, your body could instead complete the ground path and may cause shock or electrocution.

- Type of timber material for the beam



Image of beam I had in mind:



Conclusion.

I had some ideas in mind for a wooden beam from the resources I found at home. However the timber beam I thought would be great for my project and be one of the reusable part of my design has been damaged by age, previous work and infested in white ants, If I was to continue using this timber beam, It will result in the timber being unsafe due to its weakness in durability and quality. Therefore I have come to the conclusion that I will investigate what timbers are available in stores eg. Bunnings that are from a sustainable plantation to ensure that I am not participating in the decrease of deforestation happening all around the world.

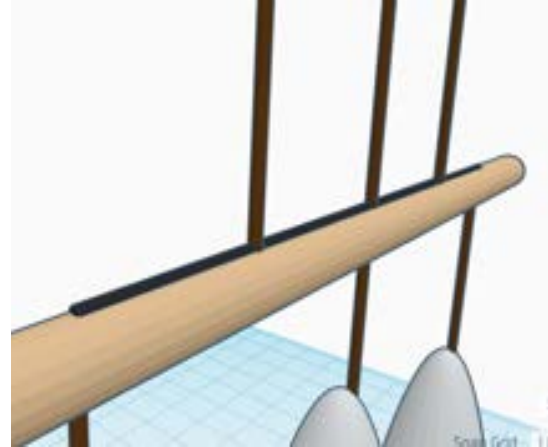
http://www.oaktreecape.com/furniture/misc_trees/

Material type	Characteristics	Justification
 Treated pine	Features: <ul style="list-style-type: none"> - Australian grown AFS and PEFC certified plantation pine - Termite and fungal resistant - Poor quality grain due to being a dry grain resulting in a flaky splintery texture. - Extremely light timber Price: <ul style="list-style-type: none"> - \$11.42 for 75mm by 1.8metre log 	I do like the treated pine and how light weight the timber is. However I have come to the conclusion that the tone of grain colour is too light for my specific aesthetic.
 Tasmanian Oak	Features: <ul style="list-style-type: none"> - Dense & Resilient Hardwood - PEFC Certified (Sustainable timber plantation) - Excellent Staining Qualities - Has a slight pinkish tone with prominent grains - Slightly heavier than pine wood due to its density Price <ul style="list-style-type: none"> - \$47.00 for 75mm by 1.2metre log 	I come to conclusion that the Tasmanian Oak is the best fit for my project because it includes the aesthetic features I want to achieve such as the pink undertone and the excellent staining qualities is a great positive which is why the piece is more on the pricey side, resulting in a good quality build of timber suiting my target audience. Therefore, I have chosen to go with the Tasmanian oak.

Application of conclusion for choosing a timber beam/dowell

I found visiting stores to investigate what type of timber I would like for my project was easier, because I was able to consider the texture, grain, tone, weight and size as a criteria for my chosen aesthetic of the product. Therefore, I found that the Tasmanian oak timber dowel stood out to me the most due to its unique slightly pink undertone firm grain, and extremely good quality for staining/finishes and most importantly the timber was sustainably harvested or PEFC certified.

Where to drill for wiring



What will I use to drill?

Hand drill



Drill attachment size


- 8mm

Method

1. Power up your drill. ...
2. Adjust the torque to suit the material you're drilling. ...
3. Find the Xs or dots you made to mark where to drill.
4. Get at the correct level to drill the hole.
5. Stabilize your drill vertically.
6. Gently pull the trigger.
7. Once you've drilled as far as you need, put the drill in reverse.

Base of support for the timber and electrical cording

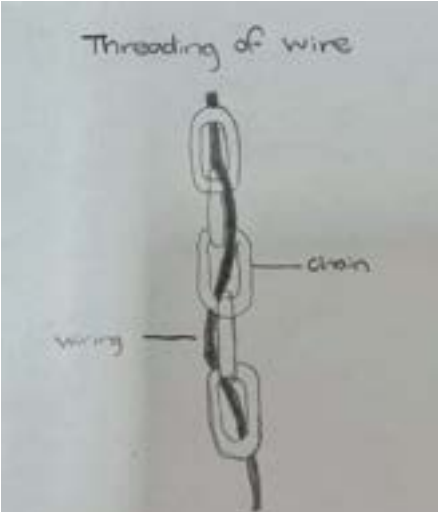
- *Investigate material that will be able to support my timber beam and wiring?*

Material	Justification
<p>Chain</p> 	<p>Aesthetics</p> <ul style="list-style-type: none"> - I like the rustic oxidisation look of the chain, fitting in nicely with the rustic country aesthetic. - representation of harsh country farming condition and can see the beauty in something that is no longer considered beautiful. - Battled with weather <p>Reusability</p> <ul style="list-style-type: none"> - This source of used material is very popular on my farm as we utilise the chain for hoisting and for locks on our gates, some may rust from exposure to weather and become damaged, resulting in been replaced and dumped and stored as clutter. Therefore I wish to reuse this material. <p>Support</p> <ul style="list-style-type: none"> - Chain is renowned for its flexibility and strength, and it can make an excellent material for hanging and supporting light fixtures/pendants.

- **Application of conclusion**



Therefore, I have chosen the rusted chain for the base of support to the timber and electrical cording.

- **How will the chain support the electrical cording?**

	<p>Aesthetic</p> <ul style="list-style-type: none"> - I will be able to thread the wiring through the chain, because it is a great way to not only hide the wire but to elevate the aesthetic and furthermore provides precise quality and unique detail to the centre piece. <p>Support</p> <ul style="list-style-type: none"> - The threading of wire cording will strengthen the build ensuring there is no strain of weight pulling on the wire resulting in dangers of wires being damaged or torn and sparking. Concluding in the product being unsafe and unusable. The chain allows for the wire to distribute the weight to the chain in order for support.
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Hardware

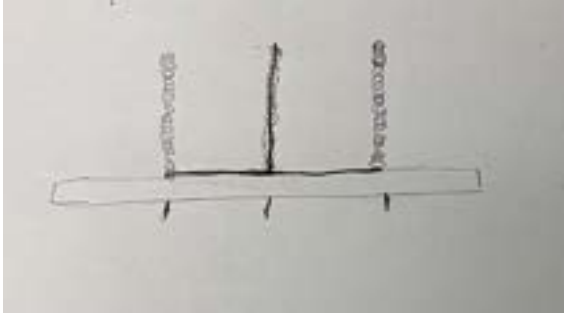
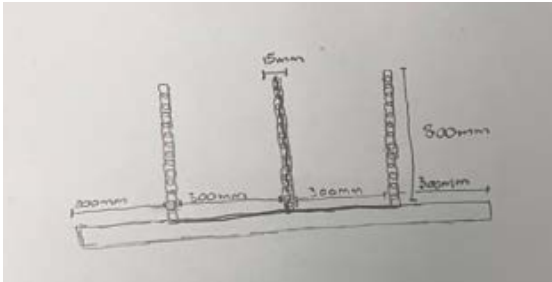
How will I secure the electrical cording to the timber dowel?

Staples	Features
 <p>The image shows a clear plastic package of Paslode staples. The label on the package is purple and white, with the word 'STAPLES' in large letters. Below it, it says '30 x 4.0mm' and 'GALVANIZED'. To the right of the package, a hand is shown holding a black electrical cable. A single staple is attached to the cable, demonstrating its use.</p>	<p>Staples are used to securing items to other materials by simply hammering these "U" shaped staples into the timber securing things such as ropes, electrical cables, wire, and so on. Making the build quality more thought out and efficient, ensuring that there are no electrical cords running all over the place, which can lead to many safety concerns as the cording can face a lot of weight strain if not secured down correctly or at all, causing issues in the cording attachments to tare, brake, and spark. Declaring the product to be hazardous and cause electrocution.</p> <p>Pros</p> <ul style="list-style-type: none">- Holds wire in place- Strong and sturdy <p>Cons</p> <ul style="list-style-type: none">- Takes up alot of surface area- Concerns of splitting timber
 <p>The image shows a black plastic cable clip with a silver screw. The clip has a U-shaped opening for the cable and a flat base for the screw to secure it to a surface.</p>	<p>These caple clips will be able to hold my electrical cording in place with less surface area taken compared to the larger steel staples. Therefore these clips ensure the electrical cordings are neatly together and no pinching.</p> <p>Pros</p> <ul style="list-style-type: none">- Small and hides the cables well- No concerns of timber splitting <p>Cons</p> <ul style="list-style-type: none">- I believe there are no cons



Application of Conclusion

- Therefore I have chosen to go with the small cable clips as they will be the best fit to work with on a small surface area of timber to ensure all cables are compact and neatly clipped together.

Rough Sketches of my ideas

Images	Analysis/Justification
	<p>I decided to go with one electrical cord travelling up the middle suspending chain so the wires are easier to install, while the outside two chains are strictly for structural support.</p>
	<p>The wire is able to thread through the 6mm gap in the chain loop travelling 500mm up to the ceiling.</p>


How am I going to attach the chain to the timber beam?

Materials	Features
<p>Screw eye hook</p> 	<p>A screw eye hook can be used to attach cable to objects. However, when using a chain I will need to weld which is something I want to avoid doing for my project. Because of producing fumes and gases when manufacturing.</p>
<p>Q-Hangers</p> 	<p>These types of hooks are great for easy installation with no fumes and gases being released during manufacturing. Chain loops are able to fit freely through the Q-Hanger. Makes removing easier as well as installation so the product is able to be taken apart if necessary.</p>

Application of conclusion

- Therefore I have chosen to go with the design of the Q-hanger hooks as the installation does not require any welding.

How am I going to attach the three light shade wires together?

Item	Features
 <p>Junction box for three wires</p>	<p>A junction box is simply a standard electrical box that is mounted securely to the house framing or another structure, containing the connection (splice) of two or more circuit cables. This is so you are able to twist these cables into one electrical cording out the other end of the box.</p> <p>Size 42mm x 25mm x 73mm</p>

Where will I place this Junction box and application of conclusion:

- **Unfortunately** the Tasmanian Oak timber dowel is not wide enough to utilise a junction box, therefore the timber is unable to be used for further progress into my design. I will return the dowel to the store so I am not putting any products to waste throughout my design. So, I have gone back to investigating what other materials I have on my farm that is able to secure and hide the junction box.

What new timber beam to use?

Discussion with client on Saturday 29th of July 2023

Fortunately, my clients (parents) have found a piece of timber found from an old tractor sowing part. With images bellow

Two parts separate
TOP VIEW

Two parts together
SIDE VIEW

Two parts together
FRONT VIEW



Analysis

- I enjoy how the beam is unique and adds personality to the product while also relating to the rural, country, and rustic aesthetic.

Where will the junction box sit and how will it be secured?

- The idea I gave to my clients is that I will place the junction box in between the two slabs of timber shown in the image below. The junction box will be secured by being drilled in place with the application set the product comes with.



Sanding

I would like to avoid the energy consumption of using a disk sander, and move towards using a sanding brick.

My clients also asked to sand down the metal and refurbish while still incorporating the rustic look but make it look more luxurious and completed.



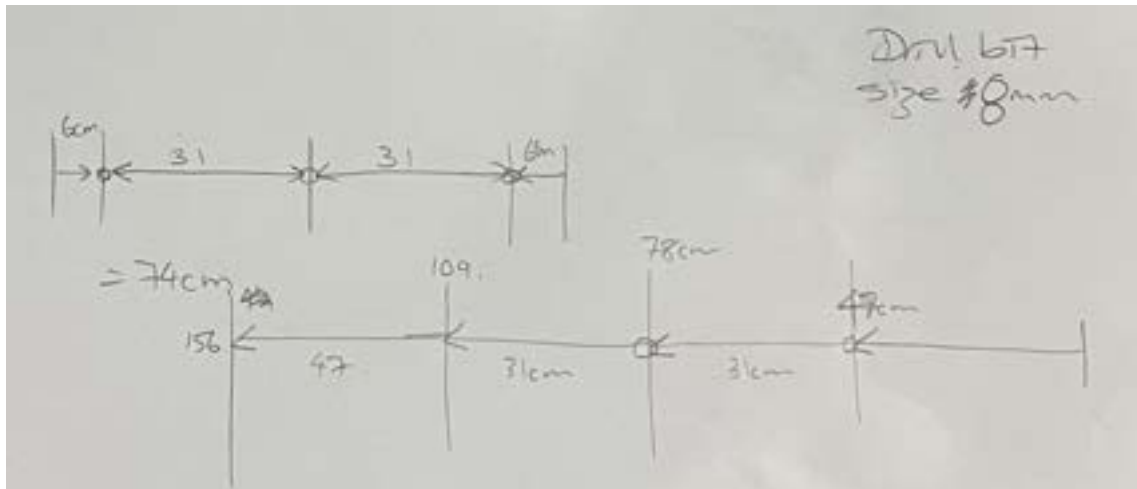
Method for sanding

1. Ensure your **working space is clean**, as little stones or any dirt can leave imprints, and darker grain patches from the dirt when sanding, resulting in the timber looking rushed and patchy.
2. Select an **appropriate sanding block and sandpaper** for the job
3. **Sand with the grain** and put **steady pressure** on the block, ensuring you are not applying too much force as the timber can be left with deep impressions.
4. Switch to a finer grit sandpaper to give a smooth touch to the timber piece.
5. Results

What to do with timber dust waste after sanding?

- Collect waste
- As the sanded off timber consist of small particles, this makes a great immunity supplement for the growth in plants, development and reproduction. The timber dust acts as a filter as well as aeration for the soil beds.

Where to drill for new timber piece






Analysis

- This is the measurement of the whole length of the timber piece, I measured out exactly where to drill the holes to be bolted.
- The three measurements in the middle are where my lamp cordings will hang over the bolt and droop down to display the lamp.

Attaching the two timber pieces together

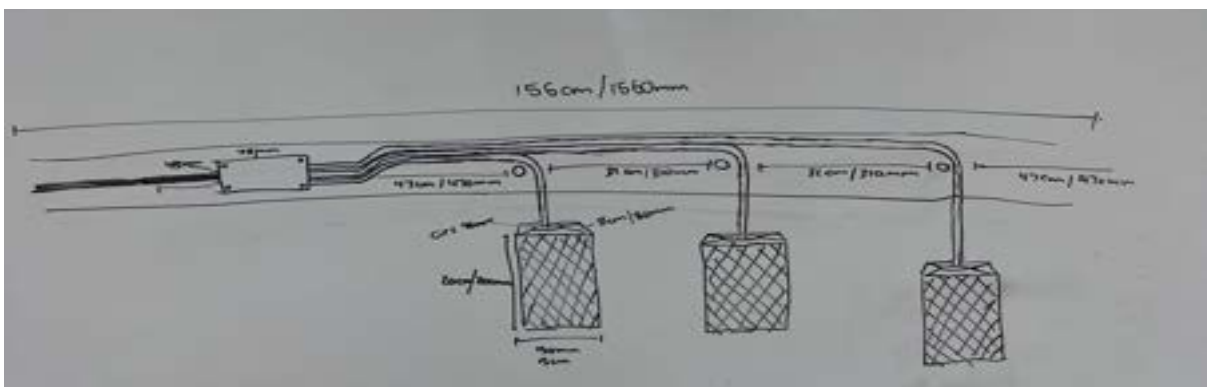
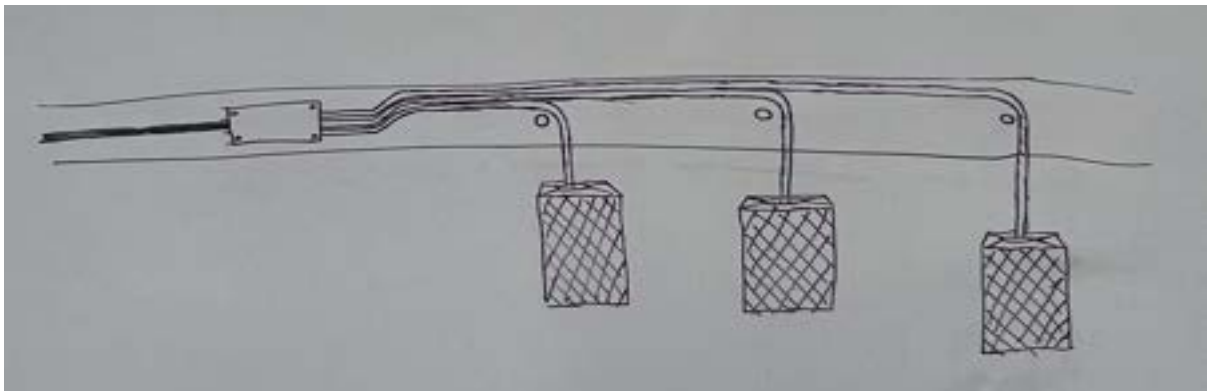
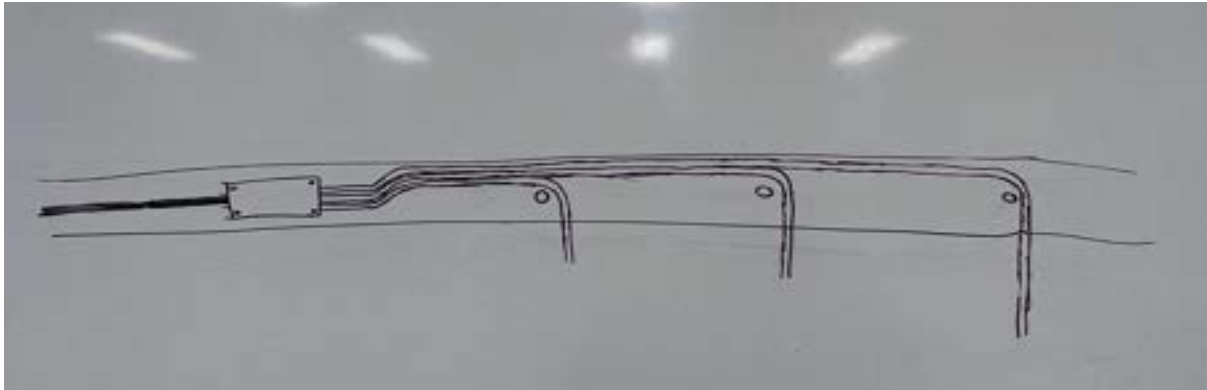
I will be bolting my timber piece together with old resources in my farm shed.

Tool piece	Analysis
<p>Bolt</p> 	<ul style="list-style-type: none"> - This bolt will be able to secure my two timber pieces together, to provide the strength and durability my product needs. - These bolts will also serve a purpose of supporting the wire cording for the lights.
	<ul style="list-style-type: none"> - I will be separating the two timber pieces with heaps of washers to ensure there is no movement in the two timbers. - These washers will allow me to adjust the width to the dimension of the junction box and to the clients likings as well.
	<ul style="list-style-type: none"> - This will secure and hold the timber in place.

Where to put electrical cording on a new timber piece?

- Due to the timber piece being two individual slabs, I am able to hide my electrical cording and the junction box perfectly. Therefore, my electrical cording will be travelling along the slab until its allocated bolt hangs down for the lighting system.

FRONT VIEW OF ONE TIMBER PIECE

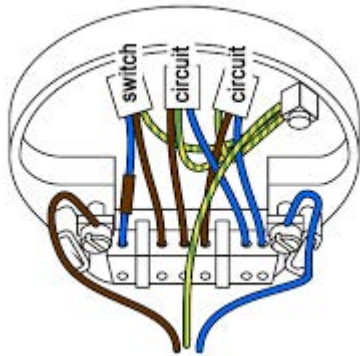


Analysis

- I was able to get an electrician to assist me with the positioning on the electrical cording to ensure there were no dangers. He also provided me with a lot of knowledge and understanding when working through the steps of wiring the cording into the junction box.

How will I attach it to the ceiling

<https://www.youtube.com/watch?v=pE8f6Hj8s6o>



Three types of wires

Attachment of positive, negative and ground wires.



Client Discussion 5th August:




My clients were happy to attach a male wall plug to my light fixture to allow me to present their piece to the class to be assessed.

Electrician response:

The electrician was able to do the wall plug and later switch the wires over to a main house circuit wiring.

Research on finishes

Image, colour, grain and common use	Working with finish	Pricing, availability, delivery	Sustainability and use on projects.
<p>Vegetable oil</p> 	<ul style="list-style-type: none"> - Vegetable oil finish can be applied to the timber with a wipe of a cloth. - Can be weather and moisture resistant - How the vegetable oil keeps in the moisture which can be bad for the wood, potentially damaging the interior of the timber resulting in mould and rotting over time. 	<p>\$7.40 for 2 L Available at all grocery stores Easy to access</p> <p>https://www.woolworths.com.au/shop/productdetails/750772/woolworths-vegetable-oil</p>	<p>Vegetable oil is sustainable because I am not releasing any harmful chemicals into the environment while I'm applying it to the timber. However, the packaging required to hold the oil is not good for our environment due to releasing harmful emissions when manufacturing.</p>
<p>Liquid beeswax</p> 	<ul style="list-style-type: none"> - Enhances the natural beauty of the wood - Helps protect the wood against stains and moisture - Beeswax acts as a protective coating on the surface, enhancing the wood's shine and helping keep it looking better for longer. - Create a wide range of woods beech, mahogany, oak, pine, teak, walnut, and yew. - Apply with a soft cloth - Allow the timber to absorb the oil for 5 minutes, before buffing back with another clean cloth. - Apply 3 coats, if timber is new or dry, repeating the same procedure. Subsequent coats can be applied straight after buffing. Each timber will 	<p>\$33.00 for 250mL liquid beeswax Australian sourced available in local hardware stores eg bunnings and Gilly's online store of all his products https://www.bunnings.com.au/gilly-s-250ml-liquid-beeswax_p0149315</p>	<p>Beeswax is a great way to protect raw timber from the exterior environment, keeping the timber rich in colour, condition and value. The beeswax will only slightly alter the colour or appearance. Beeswax oil is all naturally made ingredients sourced from our honey bees and natural oils. Gillys packaging for the 100-250ml bottles are all 100% recycled PET bottles, therefore there is no new plastic bottle being manufactured; it's all made from reusing past plastic being carbon neutral, BPA free, and 100% recycled.</p>





	<p>vary in porosity and dryness, so the number of coats required will vary. Once timber is saturated, there is no need for any more. Do not over-apply; residue can become sticky and attract dirt.</p> <p>https://www.furnitureclinic.co.uk/blog/beeswax-furniture-polish-advantages/#:~:text=Beeswax%20is%20suitable%20for%20all%20wooden%20surfaces&text=It%20can%20even%20be%20used,teak%2C%20walnut%2C%20and%20yew.</p>		
<p>Solid beeswax</p> 	<ul style="list-style-type: none"> - Solid beeswax can be applied by using a lint free cloth 	<p>\$5.95 for 30g</p> <p>https://www.bunnings.com.au/apiaries-8-30g-100-pure-beeswax-bar_p0076398</p>	<p>If stored in a cool, dry place, Beeswax Polish will last for years without drying up or going off. Beeswax consists of all natural ingredients straight from the Western honey bees themselves.</p>
<p>Interior Timber tung oil</p> 	<ul style="list-style-type: none"> - Easy to apply with cloth - Preserves and protects timber with a highly-durable tinted finish - Enhances the natural characteristics of the timber grain - Can darken the tone of colour dramatically depending on how much you use 	<p>\$29.60 for a 250ml tin of varnish</p> <p>https://www.bunnings.com.au/feast-watson-250ml-gloss-aged-teak-stain-and-varnish_p1520050</p>	<p>However, most lacquers and tung oils have harmful fumes when being applied and can lead to headaches and nausea.</p>
<p>Dark tinted solid beeswax</p> 	<ul style="list-style-type: none"> - easy to apply - Protect timber from moisture. - Enhances the natural grain. - Darken the grain. - Great for all types of wood 	<p>\$28.99 for 125ml tin of wax</p>	<p>Last up to 5 years, protecting the timber from any external characteristics. Not harming the environment.</p>


Experiments

Aim: test the look of a Variety of finishes

Method: apply each finish onto timber sample

Result

Veg Oil	Liquid beeswax
Results 	Result 
Conclusion <ul style="list-style-type: none">- Easy to apply- Leaves a glossy shiny finish, slightly darkening and hydrating the grain of the timber.	Conclusion <ul style="list-style-type: none">- Easy to apply- leaves a nice semi-gloss waxy layer exposing and slightly darkening the pink grain undertone of the Tasmanian timber underneath.
Solid Beeswax	tung oil
Results 	Results 
Conclusion <ul style="list-style-type: none">- Left a foggy film from the wax which is very protective for the wood. However, the foggy white wax washed the natural grain of the wood away.	Conclusion <ul style="list-style-type: none">- Looks ok. However there is no alteration in the tone of the timber. I would like to see something more darker toned.

Tinted/dark Beeswax	
Result 	
Conclusion <ul style="list-style-type: none">- I love how the dark colour in the wax highlighted the natural grain of the wood and made it appear amazing.	

Application of conclusion

- My experiment of testing stains on timber allowed more to explore the types of finishes there are and how they appear on my chosen timber before adding to more final projects. Therefore, I have chosen to go with the dark/tinted solid beeswax for the stain of my chosen timber piece because it will pair aesthetically with the warm lighting.

Final technical plan

light Shade Design. 03/08/23

Top view



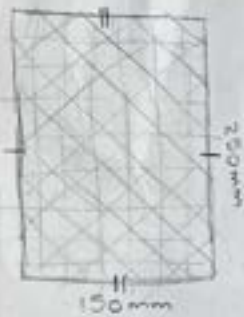
side view



x 3



Front view



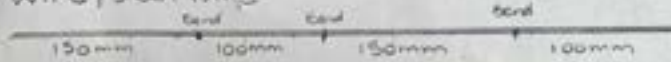
Cutting list

x 6 for double layering



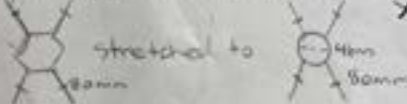
wire/steel wire

x 6



light bulb attachment

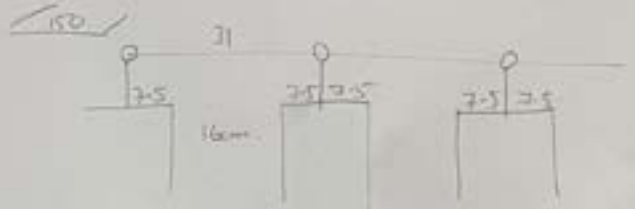
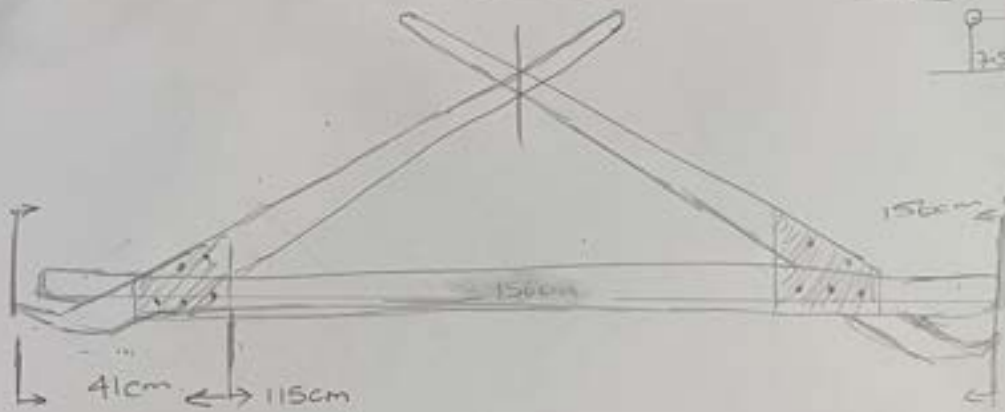
x 3



Client Signature:



set square to find centre.



28
11
12

Drill bit size 8mm

$$156 - 115$$

$$= 41 \text{ cm} \times 2$$

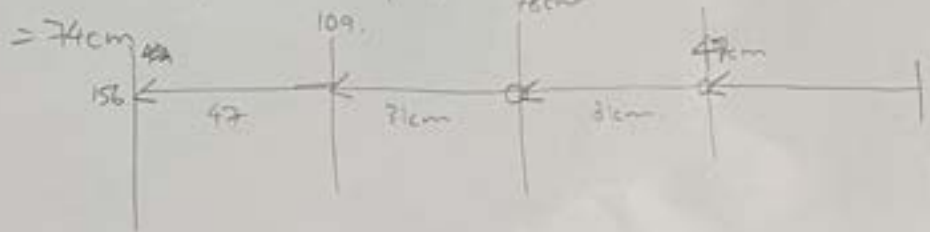
$$= 82 \text{ cm}$$

$$= 27.33 \text{ cm}$$

$$156 - 82$$

$$= 74 \div 3$$

$$= 24.66 \text{ cm}$$



Production Of Product

Production of Light shades



- I started by measuring out the length of the wire in order to bend into the base frame for the shade, main type of structure.



- Next I trimmed to the allocated length, using pliers to cut through the steel wire.



- I began to bend the wire to create corners using the flat end of the pliers.



- Then I attached the corners to create a rectangular shape.



- I made two of the rectangular wire per shade.



- Here I began wrapping the chicken wire around the rectangular steel wire to begin taking the light shade shape



- After the firsting chicken wire wrapping, I weaved a straight piece a wire through the corners of the shade to provide further strength and to ensure the corners maintain their straight edges.

Wrapping with another layer of chicken wire to the position of my clients satisfaction. I also noticed that double wrapping gave the shade additional strength feeling sturdy and durable.



I then made the lighting cord attachment using one of the hexagons stretching it out to become a circle to slide into place to be attached.

Repeated these steps 3 times

Production of sanding



I began sanding the first layer of timber with a medium grit to get rid of any extra marks, patches and small imperfections. Later doing another layer with the more fine sand grit to smoothen everything out and give the timber a shiny new refurbished look

After the timber sanding I began to sand the metal guards on each corner to sand down the really oxidised rust that occurred from over time and weather.

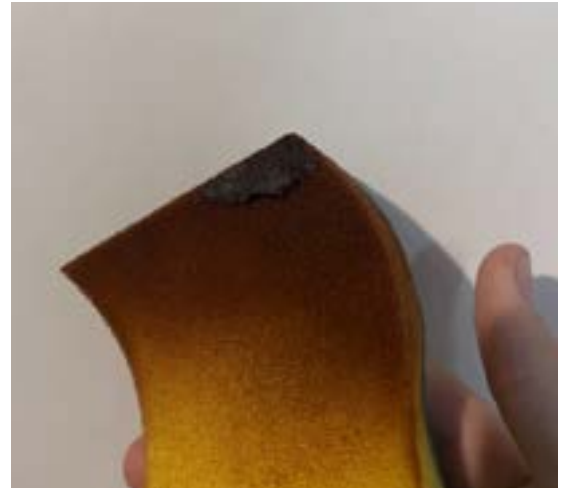


This was where I could really start to see the difference in colour and the overall premium

That's the sanding completed for my timber beams/slabs.

quality of the timber as it has stood through weather conditions

Production of applying stained beeswax finish



I gathered the equipment I needed consisting of the tinted beeswax and a firm sponge.

Adding small amounts of the beeswax for each layer to ensure I am not developing an uneven finish for the end results. Allowing the timber to set before adding additional layers.

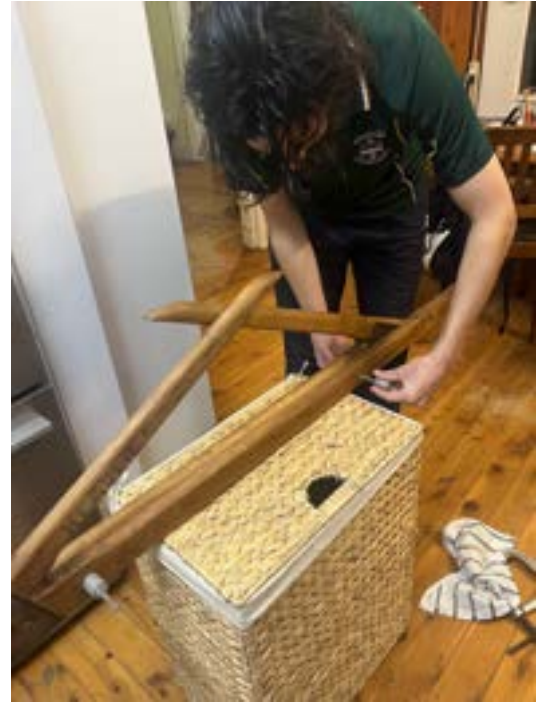


The final results of the timber turned out amazing. 22nd July

Production of bolting the two timber slabs



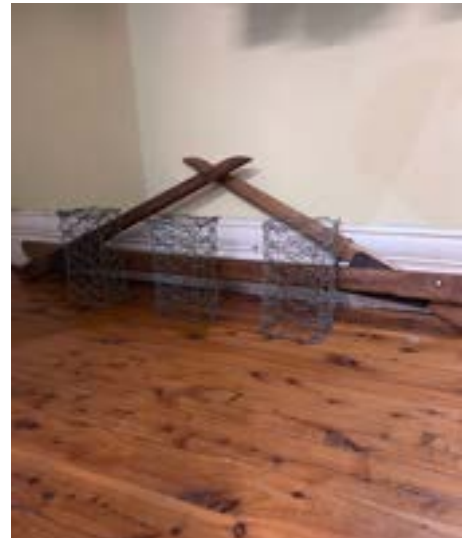
I began drilling the marked spots with a 8mm drill bit and making sure I was keeping the drill as straight and level as possible to ensure a balance hole for the bolts to travel through.



Then I checked if the holes were all aligned by placing the bolts in place



Placing washers inbetween to separate the two slabs for the junction box and electrical cording to be hidden.



Shade and timber slab together

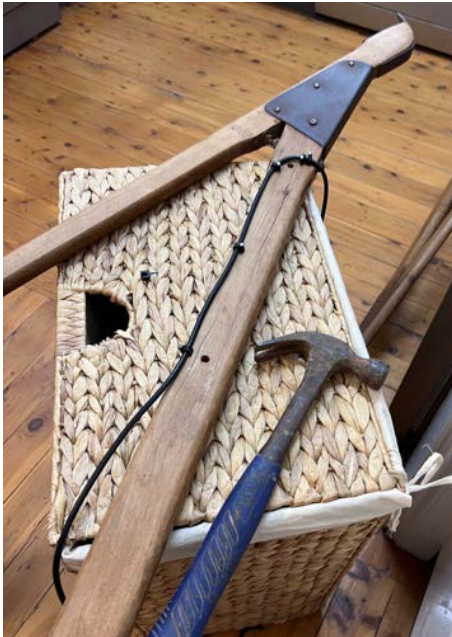
Applying electrical cording



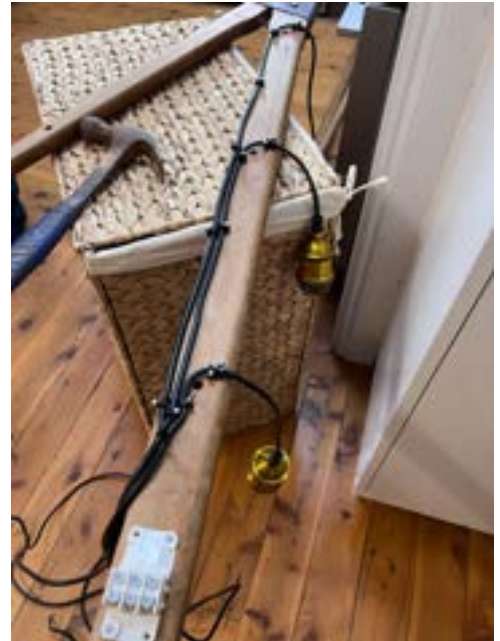
Here the electrician layed everything out and took me through the steps on his way around attaching the wires



We measured up where the junction box will be placed behind the steel corner cap and securing to the timber with screws



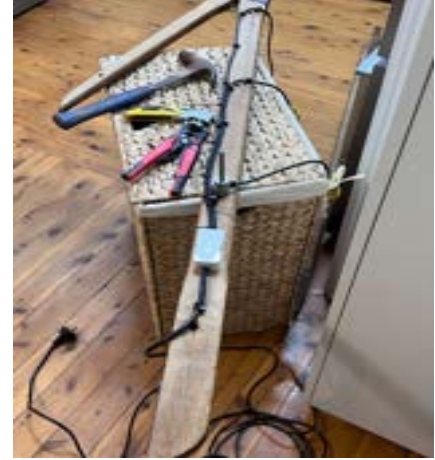
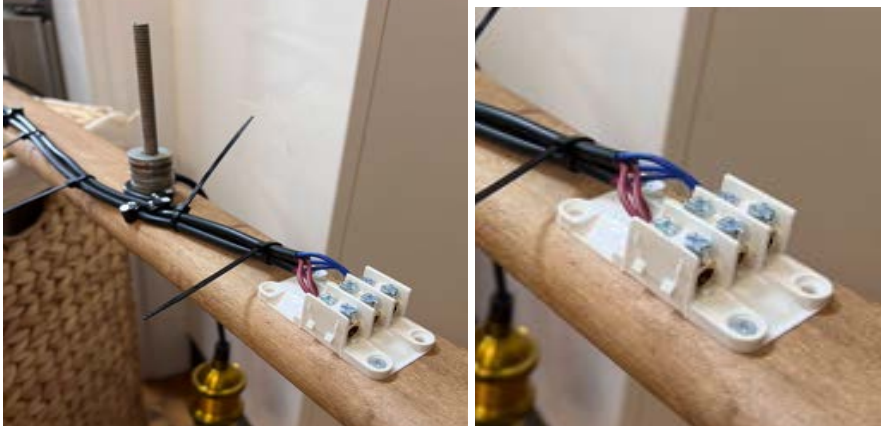
Then we began nailing the cable clips in order for the electrical cording to travel along the timber slab without sticking out, being pinched or appearing messy. Therefore these clips kept everything



Everything was clipped in and my clients were happy on the positioning of the lighting attachments as there cant be any

neat and tidy.

alterations made in cording length due to cutting for junction box.



The electrician then took me through the steps of wiring a junction box consisting of a positive current, a negative and a ground wire also known as earth wire.

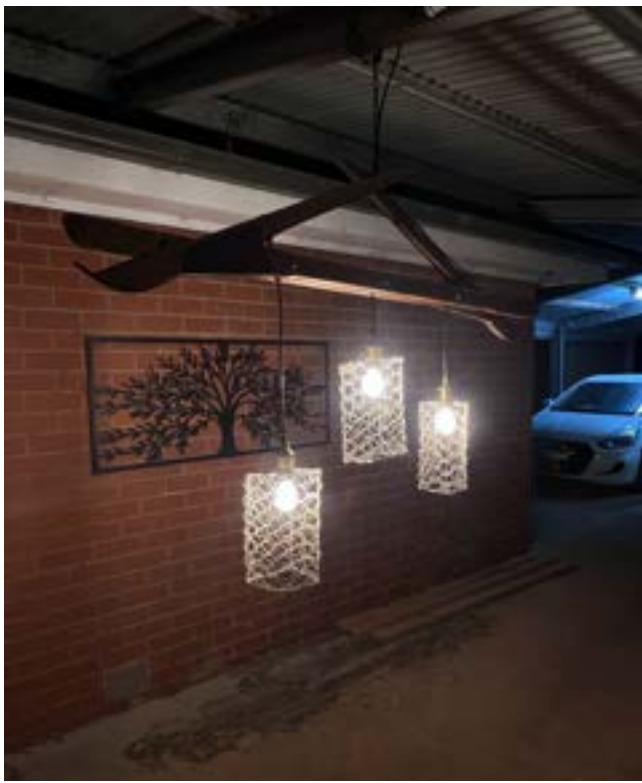
Then attaching these three wires into one male wall plug cording in order to present to the class and be assessed.



We closed it up with the second slab of timber to hide all the electrical cordings and junction box.

Lastly the electrician checked for any materials on the timber that may pick up the electrical current or leak by using an electrical current reader/scanner to ensure the project is safe to be turned on.

Final product made





Survey

I constructed some survey questions for my clients (Nadine, Stuart and Michala) to fill out, consisting of:

<p>Are you happy with the results? *</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>
<p>Does the product work to your needs? *</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>
<p>Does the product meet the trend of a rustic, rural farm Aesthetics? *</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>
<p>Does the product create an inviting and comfortable space? *</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>
<p>What was the experience/service like working with me? *</p> <p><input type="radio"/> Great</p> <p><input type="radio"/> Good</p> <p><input type="radio"/> Ok</p> <p><input type="radio"/> Bad</p>
<p>Any feedback or concerns? *</p> <p>Short-answer text</p> <hr/>

3 responses

[Link to Sheets](#)



Accepting responses

Summary

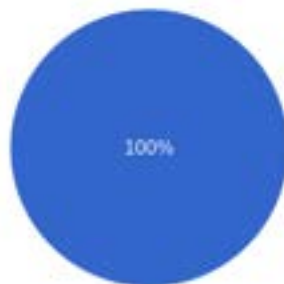
Question

Individual

Are you happy with the results?

[Copy](#)

3 responses



● Yes
● No

Does the product work to your needs?

[Copy](#)

3 responses

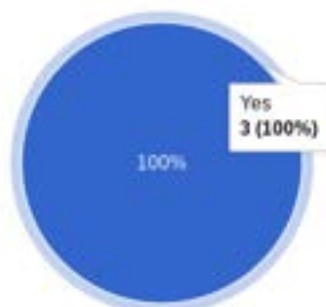


● Yes
● No

Does the product meet the trend of a rustic, rural farm Aesthetics?

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3 responses

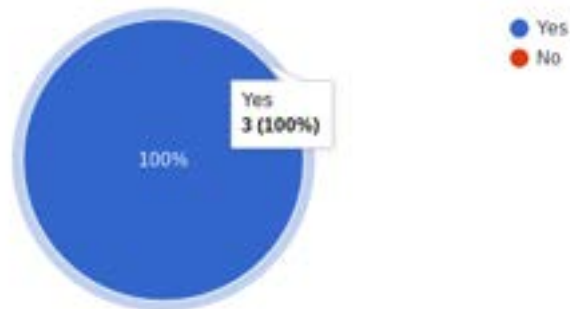


● Yes
● No

Does the product create an inviting and comfortable space?

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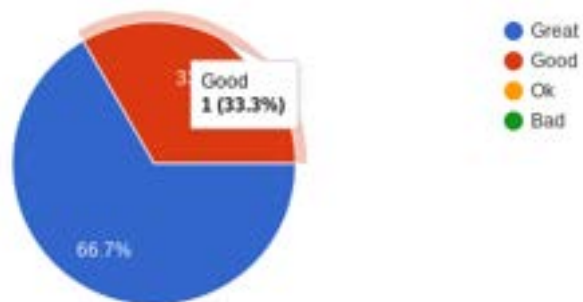
3 responses



What was the experience/service like working with me?

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3 responses



Any feedback or concerns?

3 responses

No

Darcy was was easy to confer with about design and construction.

I felt the project went to plan as Darcy and I brainstormed a lot about placement of lights, wiring ect... to produce a design we both loved.

Project Evaluation

- I aimed for the project to be successful, so I made sure the quality, durability, and aesthetics fit my standards. To help with this, I made the decision to ask my clients if they were satisfied with the outcomes and whether the product met their needs.

Are you happy with the results,

Does the product work to your needs?

Does the product meet the trends?

Does the product create a comfortable and inviting environment?

How was the service?

The purpose of this survey was to ensure I have met each and every aspect of my criteria for success.

Throughout the project, I successfully incorporated sustainable design principles, inclusive of material selection, manufacturing processes, and usability considerations and to allow me to explore areas where I may need to improve or gain more knowledge moving further on in my design journey.

In our current world today there is a shift in designing products to the concept of being environmentally aware. Moving towards sustainable behaviours of being more considered in addressing the impacts on the individual, environment and society.

With this objective in mind I decided to design a light fixture made from reusable timber and wire. The purpose was to showcase that stylish and functional products can be created using unwanted materials, reducing waste and promoting sustainability.

Sustainability was at the core of my design goal, and I implemented several features to ensure the longevity and environmental impact of the light fixture. By using materials that had reached the end of their useful lives and would otherwise have been thrown into landfills, I decreased the demand for virgin resources, decreased mining for steel materials, and minimised waste. These materials release harmful toxins into our environment by flowing into water systems and entering vegetation systems, contaminating the produce we eat.

During my manufacturing process, I ensured that I investigated beforehand to confirm I was avoiding any harmful emissions or waste throughout the development process of sanding, staining and drilling which consist of a lot of work done by hand to avoid the abuse of energy consumption of utilising heavy machinery. Furthermore, during the sanding process I implied some ways of sustaining the waste of timber remains after the production of sanding and drilling by transporting it into compost and garden beds to enrich the soil for plants to thrive.

My light fixture impact on the individual consists of the significant concept of aesthetics and functionality, therefore this enhances visual appeal, and emotions to the individual as the fixture brings personality into their homes to improve Individuals moods and well beings. This was done by investigating the tones of lighting and functionally being user friendly to hold or assemble with no wire or electrical cording creating concerns of injury.

The lighting fixtures impact on society, opens up the wide range of possibilities to encourage designers to consider reusing resources to their products to avoid or decrease the use of virgin materials. By showcasing the light fixture made from reusable materials, it raises awareness about sustainability and the importance of utilising reusable alternatives. This can inspire individuals and communities to adopt more environmentally friendly practices in their own lives.

In conclusion, the individual, environment, and society all have a significant impact on the reuse of materials to make a lighting fixture. From an individual perspective, reusing materials can promote creativity and resourcefulness, while also reducing waste and saving money. The environment is positively impacted as repurposing materials reduces the need for new resources, conserves energy, and minimises pollution and landfill waste. Lastly for society, reusing materials for lighting fixtures promotes sustainable practices and encourages a shift towards a circular economy. It also helps foster a sense of community and collaboration as individuals share ideas and resources. Overall, considering the individual, environmental, and society impacts, reusing materials for lighting fixtures holds great potential for creating a more sustainable and responsible future.

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