Research: Canvas
Canvas is a durable, plain-woven fabric used for making a variety of items for which sturdy and strength is required. Thus, it is ideal for making sails, tents and backpacks.

Research: Leather
Leather is a durable and flexible material created by tanning animal rawhide and skin. It is this durability and flexibility that makes it ideal for furniture, clothing and bags. Leather is typically made from cow-Hyde which is dyed and used for decorative, creative and functional purposes.

Experimentation
Introduction: In order to decide which material I would use for my exterior material I used the top 2 options from my target market research (page __) - Leather and Canvas SAMPLES - and conducted a series of experiments as outlined in the aim.

Aim: To test each fabric sample on Feel, Stretch, Strength, Ability to Rip, Ability to Stain/Clean & Water Resistance and rank each fabric in each category. This will produce a final result with the fabric most appropriate for my design.

Method:
1) Test each material on feel (based on coarseness, smoothness, flexibility and softness), stretch (between a clamp and stretching the material high with ruler), strength (placing material between clamp and a weight), water resistance (spilling water on each material and laying them out to dry) and if the materials stain.
2) Rank each material in a table of results (the higher number the better!)

Results

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Canvas</th>
<th>Leather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel</td>
<td>Smooth surface, slightly coarse</td>
<td>Smooth surface, very smooth</td>
</tr>
<tr>
<td></td>
<td>texture; Heavy (with little</td>
<td>texture, slightly heavy</td>
</tr>
<tr>
<td></td>
<td>structure - ideal for bag</td>
<td>(with structure - ideal for</td>
</tr>
<tr>
<td></td>
<td>exterior), Not flexible</td>
<td>bag exterior), flexible</td>
</tr>
<tr>
<td>Stretch</td>
<td>Stretched 0.2 cm</td>
<td>Stretched 0.4 cm</td>
</tr>
<tr>
<td>Strength</td>
<td>Held with ease</td>
<td>Held with complete ease</td>
</tr>
<tr>
<td>Ability to Rip</td>
<td>Didn't rip at all when</td>
<td>Didn't rip at all when</td>
</tr>
<tr>
<td></td>
<td>considerable force was applied</td>
<td>considerable force was applied</td>
</tr>
<tr>
<td>Ability to stain/clean</td>
<td>The stain didn't wipe off, but</td>
<td>Did not stain at all and spill</td>
</tr>
<tr>
<td></td>
<td>it was slightly removed in</td>
<td>wiped off straight away</td>
</tr>
<tr>
<td></td>
<td>warm water</td>
<td></td>
</tr>
<tr>
<td>Water resistance</td>
<td>Very damp - The fabric became</td>
<td>The shape wasn't altered at</td>
</tr>
<tr>
<td></td>
<td>heavy as it absorbed a lot of</td>
<td>all and the water wiped off</td>
</tr>
<tr>
<td></td>
<td>the water</td>
<td>and evaporated straight away</td>
</tr>
<tr>
<td>Total Points (x12)</td>
<td>6.5</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Evaluation: From this experimentation I have concluded that Leather will be most appropriate for my project. By the ranking system – it is clear it was a far superior material to employ based on a range of criteria.

APPLICATION OF CONCLUSIONS
Now that I have clarified which material will be used, I can begin to look at purchasing materials and creating criteria based upon different leather types alone.

Purchasing Materials
Now that Leather was chosen as the material it is important to select the right type from a range of different styles, thickness’ and textures.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Requirement</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.8 - 1 mm</td>
<td>To allow structure and allow the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bag not to get too thick with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lining</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Front: 27x35cm Side: 35x35cm Base: 27x5cm</td>
<td>To allow 5cm on the sides and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8cm above and below the set of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solar panels. Additionally, to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>allow a 13&quot; laptop to fit inside</td>
</tr>
<tr>
<td></td>
<td></td>
<td>so it is ideal for students.</td>
</tr>
<tr>
<td>Texture</td>
<td>Smooth, soft and structured</td>
<td>The texture must be smooth and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>soft so it is nice to feel and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>touch, but also coarse enough to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>provide structure.</td>
</tr>
<tr>
<td>Ability to Wear</td>
<td>The material must not mark easily and</td>
<td>The material must not mark and</td>
</tr>
<tr>
<td></td>
<td>wear nicely</td>
<td>cause indentation easily but must</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wear nicely and become soft and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unmarked with time.</td>
</tr>
</tbody>
</table>

APPLICATION OF CONCLUSIONS

From this criteria I was able to select appropriate materials when visiting NSW Leather.

I visited NSW Leather - Botany, Sydney - where there was an entire warehouse of leather of all different textures, colours and styles.

I then looked at the thickness of different pieces of leather using a ruler.

I moved around the warehouse feeling the different textures of the materials and testing how easily they marked with the end of my nail.

I selected 2 materials that satisfied my criteria. One that is simple for the front and back panels, and a textured piece for the side design.
Research

How do Solar Panels work?

Solar panels are made with Silicon, an element on the periodic table that is a semi-metal, and shares similar properties of both metals and non-metals. This means it is a semi-conductor, a conductor of electricity and an insulator. Essentially, it can allow electricity to flow or not. The sun emits photons - when these come into contact with the silicon in the panels the electrons remove the electrons from the silicon atoms, thus creating a flow of charge, a flow of electrons.

This silicon is ‘sandwiched’ between 2 layers, a positive and a negatively charged layer. These create an electric field. When the electrons are removed from the silicon, the field has a force on those electrons (this can be seen in the formula: \( F = qE \). This means that a charged particle WILL experience a force when in an electric field). As electrons have a negative charge, they experience a force that moves it to one side of the panel. This then creates a flow of charge that can be used for electricity.

How a solar textile works? When light shines on a solar textile, the solar cells (that are designed to be small, thin and flexible) embedded in the textile fabric convert some of the light into electricity (the rate and amount of light converted depends on the quality of solar panels, the wattage and the solar conversion rate).

The future of solar technology: Solar Panels / Solar Fabric

The future of solar technology is bright, with new cells and batteries developed by scientists that are thin, light, soft stretchy that can be applied to the skin like a Band-Aid.

Advantages: lightweight, portable, robust, versatile, provide flexibility, creates energy

New solar cells are being developed that have ‘spring-like’ wiring and are embedded into this layers of rubber, allowing them to have soft, stretchy characteristics. This new technology will change the face of e-textiles and solar-textiles as they can now easily be embedded into regular, commonly used items (e.g. bags, clothing, housing, even straight onto your skin!)

Possible Solar-Panel Options

<table>
<thead>
<tr>
<th>Other Information</th>
<th>Power</th>
<th>Current</th>
<th>Physical Size</th>
<th>Weight</th>
<th>Price</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flex Solar Cells - R7</td>
<td>Comes with battery connectors and adapter</td>
<td>7 Watts</td>
<td>0.45 Amps</td>
<td>36.83 x 58.42 cm</td>
<td>0.269 kg</td>
<td>$127.00</td>
</tr>
<tr>
<td>Flexible Solar Panels AU</td>
<td>Made with mono-crystalline silicon - Weatherproof</td>
<td>100 Watts</td>
<td>5.56 Amps</td>
<td>106.0 x 54.0 cm</td>
<td>2.00 kg</td>
<td>$199.00</td>
</tr>
<tr>
<td>Oatley Electronics - 5V solar panels</td>
<td>Multiple small panels</td>
<td>82 Watts</td>
<td>7.8 Amps</td>
<td>4.5 x 9.0 cm</td>
<td>10g per panel</td>
<td>$16.00 for 30 + $1.00 for USB lead</td>
</tr>
</tbody>
</table>

APPLICATION OF CONCLUSIONS

Through comparative research, I have distinguished that the solar panels I will be selecting to purchase is the Oatley Electronics - 5V Solar Panels. This is primarily due to the price, the size and the weight. The other 2 options, whilst they are more efficient and have higher power, they are too large and too heavy to be placed in a portable bag. Additionally, they are very expensive to purchase. These panels come with 30 small panels that can be soldered together to make 1 or 2 large panels. Thus, they will be ideal for my bag design.

Experimentation - Voltage

Aim: To experiment with 1 panel and a set of 8 panels to discover how much voltage and current was created by each. Thus, I can determine the amount of panels required to create sufficient current in my product.

Method: 1) Attach a multimeter 1 panel and calculate the amount of current and voltage created when in full sunlight.
2) Repeat step 1 with a set of 8 panels

Results - 1 Panel
Initial testing with the solar panels bought was ensuring they worked and finding the current and voltage produced. Quantitative results are as below:

Voltage: 6.64V
Current: 113.5mA

Results - 8 Panels
After 8 solar panels were wired together, the voltage and current were again quantitatively tested.

Voltage: 7.8 V
Current: 900mA

Application of Conclusions
Research: Through conducting research into how solar panels work, I can grasp a deeper understanding of how solar panels work and what requirements need to be fulfilled for them to work efficiently.

Voltage: Through quantitative experimentation with voltage I was able to deduce that one set of 8 panels would be sufficient to create enough current to charge a phone in 2 hours and 5 minutes, and have very minimal damage to battery (which can occur from very high voltages).
**Experimentation - Panel Strength**

**Introduction:** In order to test the strength of the solar panels (both the glass and the interior structure) a variety of forces were applied, increasingly. This was done by dropping the same weight from a range of heights and calculating the amount of energy the solar panel's absorbed.

**Aim:** To test how much energy the panels absorbed before breaking (the glass) and being unable to function properly (produce voltage).

**Calculations**

<table>
<thead>
<tr>
<th>Height (m)</th>
<th>Energy Absorbed (J)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>0.568</td>
</tr>
<tr>
<td>0.5</td>
<td>1.137</td>
</tr>
<tr>
<td>1</td>
<td>2.274</td>
</tr>
<tr>
<td>2</td>
<td>4.549</td>
</tr>
</tbody>
</table>

The results collected demonstrated a relationship between the energy absorbed and the height from which the hammer was dropped. Thus, showing the linear relationship of these values. These results manifest that the solar panels can absorb a large amount of energy upon impact with little to no damage to the panels.

**Method**

1) Attain a mass of known weight (I used a hammer of 232.1g)
2) Drop the mass on to a solar panel from a range of heights (to increase the energy absorbed upon impact).
3) Test the solar panel was then tested to see if it produces a voltage using a multimeter.

**Results**

The higher the hammer was dropped from, the greater the impact. However, even as the panel absorbed 4.5 J of energy, it still was able to function and had no breakage to the glass.

**Risk Assessment**

<table>
<thead>
<tr>
<th>Possible Risk</th>
<th>Possibility of Risk</th>
<th>Severity of Risk</th>
<th>Contingency Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhaling the fumes produced from the solder</td>
<td>Medium</td>
<td>Medium</td>
<td>Handle with standard safety procedures and avoid inhaling fumes directly. Solder in a fume cupboard (to ventilate the toxic fumes) or solder in a well ventilated room.</td>
</tr>
<tr>
<td>Burning skin when handling the soldering iron</td>
<td>High</td>
<td>Medium</td>
<td>Handle the soldering iron with standard safety procedures and take caution when using. Wear thick gloves or use clamps to suspend item being soldered to prevent/avoid burns to hands and fingers.</td>
</tr>
</tbody>
</table>

**Research**

A soldering iron is a tool, heated via the passing of an electric current, that is used to melt solder (where solder is composed of SnCu alloy - Tin and Copper - it is Tin based as Tin melts at the low temperature of 231.9°C). Therefore, the soldering iron can be used to melt this alloy (conductor) and allow an electric current to flow between two metal components. In this case - the wires of each panel, and their connectivity pads. This will be used in my project to connect the wires of the panels together.

**Process and Results**

From practicing melting solder, the technique deduced that would be appropriate for my design is: melting the solder very thin (to make it light weight and aesthetic).

**Applications of conclusions**

Moving forward, I know that I will have little problem with damage to solar panels, so measures made to protect the panels will be minimal.
**RESEARCH & EXPERIMENTATION OF TOOLS**

**SEWING MACHINE**

**Bag Creation**

A sewing machine is a tool that stitches/attaches materials together with thread. Typically used to make items with cloth-like materials at a faster rate than by hand. This is beneficial to my project as it will reduce the time required to construct, and will produce a neat final design (with clean stitching). This will be used in my project when sewing the interior and exterior structure of the bag together (i.e. the leather and the lining) and to attach the design overlay to my bag structure.

**Risk Assessment**

<table>
<thead>
<tr>
<th>Possible Risk</th>
<th>Possibility of Risk</th>
<th>Severity of Risk</th>
<th>Contingency Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>User injury - needle passing through and stabbing fingers. This risk is increased when multiple needles are in use.</td>
<td>Medium</td>
<td>Medium</td>
<td>Take caution when moving the material through the area where the needle strikes. Take increased caution when multiple needles are in use. If stabbing does occur, turn off the machine and tend to the wound (with bandage).</td>
</tr>
<tr>
<td>Tripping or entanglement - people can become entangled in wires or hair can become entangled in the moving needle</td>
<td>Medium</td>
<td>Low</td>
<td>Ensure all wires of the machine are out of the way to avoid people tripping or becoming entangled in wires. Tie hair back when machine is in use to prevent hair becoming entangled in needle.</td>
</tr>
</tbody>
</table>

**Experimentation**

**Aim:** To experiment with the sewing machine to deduce which machine would be appropriate for my materials.

**Method:**
1) Examine a variety of sewing machines and deduce which will be most appropriate for the thickness of the leather being used.
2) Use this machine to practice a few different stitching types to ensure the machine has heavy-enough machinery so that the pins can push through the thick leather.

**Process and Results**

With larger pins and heavier machinery (the image highlighted), this sewing machine will be appropriate for sewing the exterior of my bag using leather that is 0.8mm thick.

I then placed my leather on the machine and tested to see if the needle was of a sufficient size to push through the thickness of the chosen material.

**LASER CUTTER**

**Design Overlay**

A laser cutter is a CAM machine (guided by a CAD file) that uses lasers (at a precise focal length) to cut or etch onto a variety of materials. These machines are typically used in industrial settings. I will be using this to create my design overlay as it is a precise method of cutting out a specific pattern from a variety of material (including leather).

**Risk Assessment**

<table>
<thead>
<tr>
<th>Possible Risk</th>
<th>Possibility of Risk</th>
<th>Severity of Risk</th>
<th>Contingency Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to laser beam could cause significant bodily damage/harm</td>
<td>Low</td>
<td>High</td>
<td>Ensure the laser cutter is not opened when in operation. If an accident does occur, take injured directly to hospital to receive treatment.</td>
</tr>
<tr>
<td>Eye damage from staring at laser beam</td>
<td>Medium</td>
<td>High</td>
<td>Take caution and do not look at laser beam when the machine is running. If eye damage does occur, visit an optometrist as you may have temporary flash blindness.</td>
</tr>
</tbody>
</table>

**Experimentation**

**Aim:** To experiment with the laser cutter to ensure it can perform its function, and create an aesthetically pleasing laser cut design, while factoring in risks to avoid harm to the machine or injury to people. I will not be experimenting with the black (fill) and blue (etching) as these features do not work on leather (as it burns the material).

**Method and Process (Images):**

1) Create an Adobe Illustrator File and use the line tool to create an abstract collection of lines that result in a shape. Create a thin, red outline to command the CAM software to cut when beginning the laser cut process.

2) Place a sample of my leather material in the laser cutter and programme the CAM software (UCP) on the attached computer to cut out my pattern.

**RESULT**

The result was exactly like my design on Illustrator - demonstrating the precision of this tool. The outcome was exactly what I was looking for in my design.

**Evaluation:** From this experimentation I deduced that this tool (through it’s ability to produced the desired outcome) will be appropriate for my bag design overlay.
Experimentation
Research
What is Embossing?
According to Dictionary.com: “Embossing is to carve, mould, or stamp a design on (a surface or object) so that it stands out in relief.”

How and why will I be using the ‘embossing’ technique?
Embossing will be employed to ‘brand’ my final product, to embed the logo and brand name onto the bag. This creates neat, aesthetically pleasing ‘stamps’ that are durable and will not come off/deteriorate during the products life.

Research
What is wiring?
Wiring is the installation of a system of wires that provides electrical circuits through which a current can be passed. This is vital for the transmission of electrical energy and the powering of the modern day devices we rely on today.

How will I be using wiring?
In my Industria bag - wiring is vital to ensure the bag can perform its function. Additionally, to ensure that it can not only generate the electricity from the panels, but that this electrical charge can be transported to the user and their mobile device. Wiring in my bag will connect all the panels (to generate more current), to transport this charge to a USB input, and to a connected battery device.

Series vs. Parallel Circuits

<table>
<thead>
<tr>
<th>Series</th>
<th>Parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow of Charge</td>
<td>The charge has options to branch out with many different pathways.</td>
</tr>
<tr>
<td>Breakage</td>
<td>If a component of the circuit breaks, the other pathways the charge can still flow through the other “branches.”</td>
</tr>
<tr>
<td>Voltage</td>
<td>Voltage across each of the components is the same.</td>
</tr>
<tr>
<td>Current</td>
<td>Total current is the sum of the currents through each component.</td>
</tr>
</tbody>
</table>

APPLICATION OF CONCLUSIONS
As I want to maximise current (sum of all components) to allow the charging rate of 1900mAh to be reached, and minimise the damage to the battery inside the phone (which can occur from increased voltage) - I will be making my circuit in Parallel.

Evaluation: In this experiment I wired together a series of 8 solar panels and a USB output to produce a fully functioning Solar Panel Charging device based on a design (seen above).

APPLICATION OF CONCLUSIONS
From experimenting with wiring I was able to rediscover my knowledge from Preliminary Physics and was able to practice my wiring of panels and USB cables. However, as the USB input does not have the data lines attached to any output, the USB will not charge smartphones directly as they require data line attachment. Research will have to be completed to discover how to overcome this problem.

Research
What is Embossing?
According to Dictionary.com: “Embossing is to carve, mould, or stamp a design on (a surface or object) so that it stands out in relief.”

How and why will I be using the ‘embossing’ technique?
Embossing will be employed to ‘brand’ my final product, to embed the logo and brand name onto the bag. This creates neat, aesthetically pleasing ‘stamps’ that are durable and will not come off/deteriorate during the products life.

Evaluation: In this experiment I was able to observe the demonstration of embossing onto leather bags, I have deemed this technique appropriate for my Industria Bag. This observation allowed me to learn the basics of embossing which will be developed when I take my final product in to emboss myself.
Research
What is Graphic Design?
Graphic Design is a communicative technique that combines text, shapes and images to create a visual medium through which a message can be imparted.

How will I be using Graphic Design?
I want the theme of energy, nature and the solar source of renewable energy to be prevalent in all areas of my product. In order to continue this ‘motif’ I will be incorporating a graphic design (printed on fabric) in the interior of the bag. Thus I can exploit the function of graphic design’s ability to communicate, to convey my overall message of the availability of renewable energy.

Experimentation
Aim: To experiment with a wide variety of graphic design techniques available on Photoshop and deduce which collection of techniques will be appropriate for the interior lining of my bag.

Method:
1) Find an image of a natural form/feature
NOTE: In my final lining design I will be using an image that contains solar features - however, for experimentation I required only a natural form.
2) Use geometric shapes (to match the exterior design overlay) to create a silhouette of a natural form/feature
3) Experiment with a variety of filters and techniques to create an array of final designs.
4) Show final designs to the target market to deduce which collection of techniques is the most ‘liked’.

Results
An image was attained and grids were turned on and thin, white lines were used to begin to silhouette the top of the mountain.
The creation of lines continued down the sides of the mountain and a denser collection of lines on darker areas.
Key features were highlighted with lines through using the geometric shapes and a variety of densities
I then worked on the sides of the mountain, creating an overall ‘snowy’ affect as the tops of the mountains were decorated with the designs.
Once the geometric shapes covered the entirety of the front piece of the mountain I grouped all the lines together.

RESULT #1
The background was blurred using the Average/Radial/Shape blur tools to allow the design to stand out.
RESULT #2
The design (with a lighter blue mountain range silhouette) was mirrored to create a symmetrical effect and a slight blur was added
RESULT #3
The design was moved slightly above the mountain range to increase the height and create layers.
RESULT #4
The background was blurred and the mountain and range were reflected directly above the existing image.
RESULT #5
Result 4 was expanded upon through lightening the brightness and lessening the contrast and the background image.
RESULT #6
The mountain and range were then reflected on the sky and the stars alone to make them the centrepiece.
RESULT #7
Similar to design 1 - however, this time the background (bar the mountain) was blurred to allow the details to still be evident using the radial blur.
RESULT #8
Here, the design was contrasted, inverted and brightened to allow the geometric element to shine, while still keeping the detail of the background.
RESULT #9
Similar to design 8, however, here the image was desaturated to make it black and white so that the colours of design 8 didn’t clash.
RESULT #10
Here, the background was rendered, sharpened and distorted to create a ‘moving’ feel, with a sense of urgency.

Target Market Feedback (Quantitative Feedback)
I took all the RESULT # design’s shown above to 37 people within the target market to deduce which collection of Photoshop techniques were most popular within the market.

Analysis of the Results
From the results, it is clear that RESULT #10 was the most popular with RESULT #2, RESULT #3 & RESULT #9 quite closely behind.

Evaluation: Through experimentation with filters, techniques and various features on Photoshop I was able to deduce what collection of techniques was most popular within the target market and thus answered the aim.

APPLICATION OF CONCLUSIONS
From conducting this experimentation and feedback, I was able to deduce the most popular design. Thus, moving forward I can employ these techniques in the actual design I create for my lining.

As there were a few high scoring results, I will be collating the techniques employed in those designs (10, 2, 3 and 9) and seeking ways to exploit and feature each result in my final design to broaden the range of people the lining will appeal to.
**Research**

What are some sewing techniques?
Sewing machine techniques encompass a large variety of stitches and styles including: Straight stitch, Zigzag stitch, Running stitch, Back stitch, Satin stitch, Outline stitch and decorative stitching (depending on machine of use).

Why am I using sewing techniques?
It is vital that I learn and experiment with different techniques to ensure I am using the appropriate stitching for my material: Leather. This material is thicker than most and has unique properties which mean unique sewing techniques are required.

**Stitching on Leather**

From the Experts!
After discussion with upholsterer and professional sewer Carlos Rodrigues he has informed me that due to Leather’s unique thickness, flexibility, durability and wear/tear there are 2 primary stitches that are most appropriate for this material:

- The Lock Stitch and the Running Stitch

**Comparative Study**

<table>
<thead>
<tr>
<th></th>
<th>Lock Stitch</th>
<th>Running Stitch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Practicality</strong></td>
<td>The lock stitch is very strong, can penetrate the thick material and is able to move with the flexible nature of the leather.</td>
<td>The running stitch is fairly strong, can penetrate the thick material and is able to move with the flexible nature of the leather.</td>
</tr>
<tr>
<td><strong>Aesthetics</strong></td>
<td>This stitch is discreet, straight, continuous and simple.</td>
<td>This stitch is discreet, straight, discontinuous and simple.</td>
</tr>
</tbody>
</table>

**Evaluation:** In the comparative study and the experimentation I was able to theoretically and physically compare and contrast the different stitch types.

**Experimentation - Sewing Techniques**

**Aim:** To determine which stitch (lock or running - see left) will be most appropriate for my design based on strength, durability, penetration, flexibility and aesthetics.

**Method:**
1) Place a piece of the purchased leather under the sewing machine needle
2) Fill the Bobbin and place thread on the spool pin.
3) Thread the machine and insert the bobbin
4) Draw up the bobbin thread and turn on the machine
5) Select the ‘lock stitch’ setting and begin to stitch around the edges of a piece of material and try and join two pieces of material together. Record Results
6) Repeat Step 5 with the Running stitch setting

**Results**

The running stitch was more effective and aesthetic in holding samples of the purchased fabrics together.

**APPLICATION OF CONCLUSIONS**

Through using samples of the purchased fabrics (that would be used in my final product) I could effectively conclude that the RUNNING STITCH would be the technique used to construct my bag as it was aesthetic and effective at holding leather, punched leather and the purchased WATTLE DRILL.

**Updated Final Design**

Based on Applications of Conclusions

Adjustments are as listed below:

**Quantitative Measurements**

The measurements (shown in blue) were made based upon the Target Market. This size was chosen to ensure it wasn’t too deep (information collected in final design drawings - see pg. 20) and to ensure this size was large enough to accommodate a 13” laptop (for the target market and as 13” is currently the most common size) as well as the size of one full set of 8 solar panels, with extra room on the side (for protection of panels).

- **Bag Colour:**
  Changed to black after Target Market Feedback on EOC (see pg. 16)

- **1 panel (rather than 2):**
  From Solar Voltage experiments (see pg. 20)

- **Feature/Aesthetic:**
  Only 1 final design chosen from Target Market feedback on final designs (see pg. 16)

- **Handles lengthened and thinned:**
  (from Target Market Feedback on Final Designs (see pg. 16)

- **Loop Added:**
  To allow colourful details and accessories to be added - example shown in image (a request from Target market feedback (see pg. 16)

- **Logo/Embossed Branding:**
  Changed to silver after experimenting with Embossing and bag colour change.

- **Depth:**
  The bag was made thinner based on Target Market Feedback on final designs (see pg. 16)