

# Progression in Textiles Technology

## Generating and developing ideas



# Key Stage 3




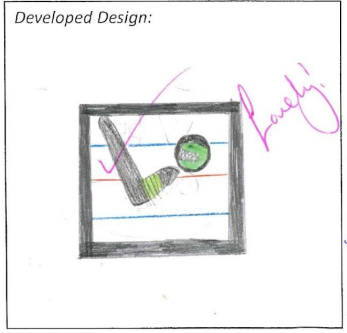
I can identify, develop and communicate design ideas to meet the needs of a user and basic specification.

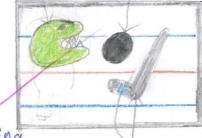
**Name:** Jeyaganja Celulke  
Fab R12

**Analysis of the brief:**  
My client is Custom Works, they are a successful merchandising company that want to create a new range of handmade keyrings. This keyring has to be an easy shape so it is possible to create but it has to be eye-catching and unique. For it to be able to be a simple keyring, it also has to be light-weight and can't be more than 8x8cm.

**Specification:**  
• A light-weight material like felt (sewing) or a light weight plastic (looking)  
• Bright colours (make it eye-catching)  
• Thinking outside the box (unique)  
• 8x8cm so you can hang it.  
• Custom Works needs to be proud and has to meet their design brief (keyring)  
• The user enjoys ice hockey - likes colourful things - my brother (age 7) favourite colours: green, blue, red!

**Initial Design:**  


**Developed Design:**  


**Final Design:**  


**Keywords:** brief, specification, client, theme, techniques, embroidery, detail, decorative, eye-catching, original, creative, textiles, embellishment, patterns, design, colour, texture, suitability, rendering, annotation, beads, sequins, applique, target market, accuracy, precision.

**Handwritten Notes:**  
I have met the specification as it is for my 7-year-old brother. It is unique, eye-catching design, it is 8x8cm and made out of felt.  
I have met 'Custom Works' needs by making a unique eye-catching design. It is 8x8cm and made out of felt.  
This is going to be a handmade design, and it has quite a simple design. It will have some variation of colours and eye-catching. This is a unique design for a young person aged 7.  
For the eye of the dinosaur, I can use a fabric marker of sewing skills to do it.  
I will be using felt as it is a light weight fabric and it is durable. As it has to be handmade, I will be hand stitching this. This keyring will not be larger than 8x8cm as a keyring is small so I can't make this a big keyring. Fabric is a natural fibre.  
I am using classic colours of an ice rink: dinosaur (green), hockey puck (black), hockey stick (blue). (blue as one of the favourite colours)  
My client is my brother age 7. I have thought about how my brother is really into ice hockey and he has loved dinosaurs for quite a while. My final design links to the colours my brother likes. He also varies choice of how he likes the image to be sometimes random sometimes basic. However in this case, I believe that it would be better for the ice hockey theme to keep it basic. I have changed from the initial design by saying that my brother likes ice hockey and dinosaurs to transforming it to dinosaur playing hockey on the ice.  
Fabric is better than anything like polyester as polyester is plastic compared to fabric it is natural which is nature/environment friendly.  
Do you mean compared to felt?

# Key Stage 3



I can further develop and communicate my design ideas by creating annotated sketches and detailed plans, to meet user needs and the specification.

I can justify my choice of skills, decorative techniques and materials.

Norm Daniel Bed 12

Analysis of the brief:

The world we live in is full of problems and we need to find ways to solve them. One of the biggest problems is climate change. We need to find ways to reduce our carbon footprint and protect the environment. This is why we need to create a cushion that is not only beautiful but also sustainable and eco-friendly. The cushion should be made from recycled materials and have a design that promotes environmental awareness.

Name:

Initial Design:

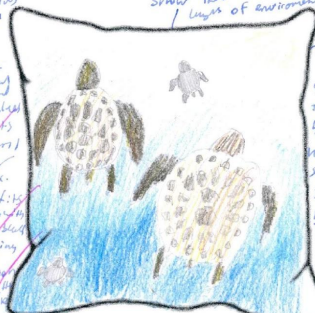


lots of ideas and designs that I like. I think I like the one with the recycling symbol and the text 'We're not what you think'.

Specification:

The cushion should be made from recycled materials and have a design that promotes environmental awareness. It should be comfortable and durable, suitable for use on a bed or sofa. The design should be eye-catching and appealing to a wide range of people.

Developed Design: My design is mainly blue to show the sea and I will use green to show the grass and trees. I will use a mix of colors to make it look like a real landscape.



It also shows the house and the trees. I like the way it looks like a real landscape. I think I like the one with the turtle and the house.

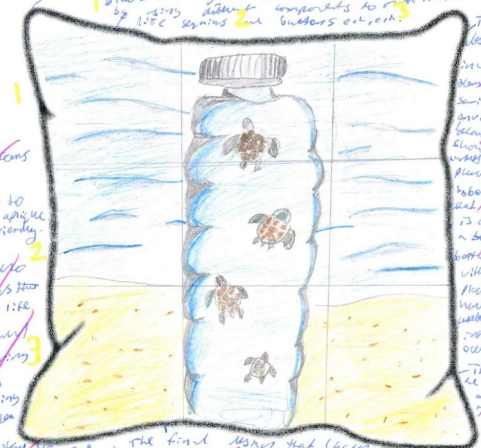
Keywords: brief, specification, client, theme, techniques, embroidery, detail, decorative, eye-catching, original, creative, textiles, embellishment, patterns, design, colour, texture, suitability, rendering, annotation, beads, sequins, applique, target market, accuracy, precision.

This is for the fact that people buy and polluting the ocean and the turtles are eating and getting sick.

Beautiful design and color.

This design is also sustainable. This design will show the world that we need to protect the ocean and the turtles. It will also show the world that we need to use recycled materials and create a sustainable design.

Final Design:



The final design that I have created is a cushion that shows the world that we need to protect the ocean and the turtles. It will also show the world that we need to use recycled materials and create a sustainable design.

Because there is a lot of pollution in the sea, I will use a mix of colors to make it look like a real landscape. I will use blue to show the sea and green to show the grass and trees. I will use a mix of colors to make it look like a real landscape.

Try not to do that with the design.



# Key Stage 3



I can generate a wide range of developments that avoid design fixation and take into account on-going investigations.

## design developments



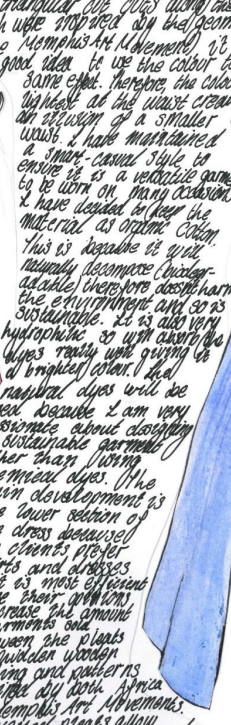


# Key Stage 4



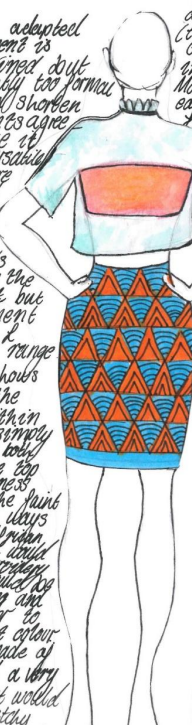
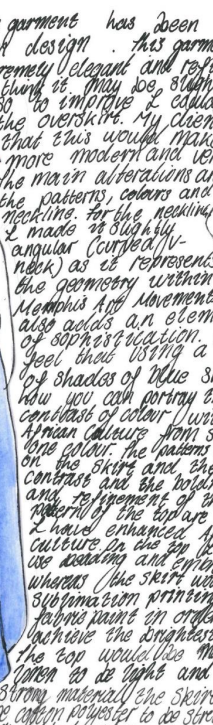
I can explore and produce a wide range of possible design ideas and/or developments showing clear links to the context and full consideration of functionality, aesthetics and innovation..

This garment was inspired by design 1. It is a mid-summer dress with ombre from red to orange that is inspired by the vibrancy of African culture. Due to the past clients' responded well to the minimising effect of the triangular cut, cuts along the waist (which were inspired by the geometry of the Memphis Art Movement) it was a good idea to use this colour to the same effect. Therefore, the colour is darkest at the waist creating an illusion of a smaller waist. I have maintained a short-casual style to ensure it is a versatile garment to be worn on many occasions. I have decided to keep the material as organic cotton. This is because it will naturally decompose (biodegradable) therefore doesn't harm the environment and so is sustainable. It is also very hygroscopic, so with adverse the dyes really will give us a brighter colour. The natural dyes will be used because I am very passionate about designing a sustainable garment rather than using chemical dyes. The main development is the lower section of the dress designed by my clients. They like skirts and dresses so it is more efficient to use them, which is to increase the amount of garments and between the pleats are wooden beads and patterns inscribed all over. Africa and Memphis Art Movement. The inverted pleats allow the fabric to be creased when moving, it will be precise and removes human error.



## Design Developments

This garment has been adapted from design 1. This garment is extremely elegant and refined, but I thought it may be slightly too formal so to improve I could shorten the overskirt. My clients agree that this would make it more modern and versatile. The main alterations are the patterns, colours and necklines. For the neckline I made it slightly angular (curved/V-neck) as it represents the geometry within the Memphis Art Movement, but also adds an element of sophistication. I feel that using a range of shades of blue shows how you can portray the contrast of colour (within African culture) from simply one colour. The patterns on the skirt and the top contrast and the boldness and refinement of the print. I have enhanced African culture in the top by adding an abstract and geometric pattern (like the skirt) which is a sublimation printing and fabric paint in order to achieve the brightest colour. The top would be made of cotton to be light and a very strong material. The skirt would be cotton polyester to be stretchy and tear-resistant (like a cotton over-skirt) so it is durable. All these materials are very sustainable for me as it is a contrast of colour but contrast of texture.

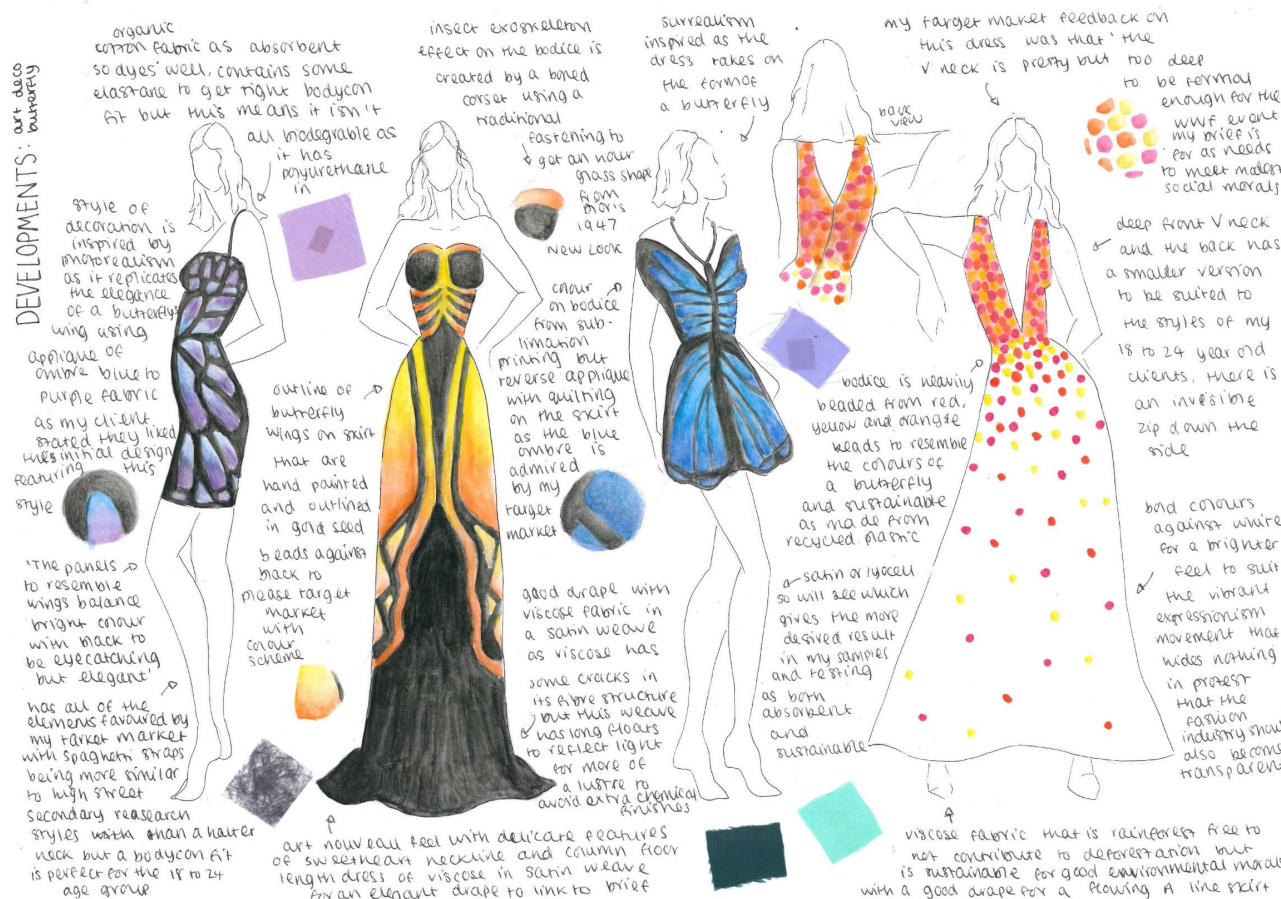


This garment has been developed from design 2. With this garment I have kept the main ideas similar such as the contrast between loose and tight to accentuate the female (thus can improve the clients' confidence) and geometric shapes inspired by the Memphis Art Movement. However, I have adapted it to be more suitable for my clients. For example, I feel that the alterations have added dimensions and made it less like office-wear. Both the skirt and bandeau top are made out of a cotton-polyester blend. This is the ideal fabric as it is stretchy, durable, easy to wash and doesn't wrinkle. The skirt is really wide. The pattern of the skirt enhances both the African and art movement themes. To achieve a precise pattern with bright colour I will use sublimation printing which is sustainable and doesn't release toxins or chemicals. The top however, will be dyed orange with natural dyes like paprika and cinnamon. This is extremely sustainable, but it requires a lot of dye to maintain the colour. The mesh top is baggy therefore creates the loose/light feel. It is lightweight and soft to the skin (which will be comfortable for the clients throughout the day, especially as it is breathable). The contrast between orange and blue is striking and brings my clients to the essence of African. It is inspired by African culture as colour is a large part of it. It is also extremely vibrant. As requested by my clients, I added hidden pockets (making it versatile and suitable for 'day wear') and added a very cool and another 'flash' of colour.

# Key Stage 4



I can independently conduct investigations leading me to produce a wide range of development proposals, through a variety of media and experimentation, accompanied by detailed analysis. I can take design risks and justify my rationale behind design decisions with full consideration of both the user requirements and specification criteria.





# Key Stage 5



I can develop advanced, high level design proposals whilst making continuous reference to the design brief/specification and user, justifying my iterative design decisions.

I can independently investigate and refine my proposals through a wide range of complex and specialist media, processes and techniques with precision in order to produce an advanced, commercially viable proposal.

## FINAL DESIGN

### The Design

From many client consultations and designs my client and I have finalised on one design. This design features many aspects of what my client has loved in previous ideas and have been merged carefully together to create a perfect garment design suitable and loved by my client. This design is what I will be constructing and making through continuing my coursework ready to be given to my client at a high quality standard and a reasonable price, ensuring I think about nature and the environment throughout.

### The Bodice

In many developments I have included a structured bodice that my client always liked the most. I wanted to include this as my client liked the romanticised theme it gave to the dress with the shape it created against the draped and flowy sleeves and skirt. This will take a lot of skill as it would include many pieces and exact measurements for it to look good and fit well on my client. The bodice would be made from a light grey silk as this fabric would create a beautiful, elegant look to the garment, as well as its shiny and natural look. I would need to use boning in this to ensure that the bodice is structured and fits well to my client. This will create shape and silhouette in the garment.

### The Skirt

The skirt is also a finalised decision as this was featured in many other initial and development designs. My client and I thought that having a silk under skirt with a voile top skirt would add volume and create a flowy effect to the garment. To create this I would include gathering to show how the fabric would allow drape to the skirt. This would also allow the dress to move in a way when my client would walk. I would use the fabrics silk and voile, using silk as the under skirt as it is soft and has a sheen, matching the bodice, and voile as an over layer as it is partly translucent and would create an interesting effect when layered with silk and detailed, appliqued images on the top.

### The Sleeves

For the sleeves I am going to keep them simplistic compared to the other parts of the design. I will use the fabric polyester voile in a light grey colour that matches the rest of the design. To make these I will gather the top and then attach them to the side of the bodice. I have chosen to add sleeves as my client liked them in one of my second design development ideas, and preferred the use of sleeves over none at all, this was also seen in my target market research.

### Lino Printing

I wanted to include the design technique, lino printing as a way to show detail on the garment. I would use this on the flames, trees and leaves to add depth into the fabric so that it is not plain. I would do this by hand, but reuse each lino piece to print lots of these designs. I will also be conscious of how I carry out the printing to think about the environment.

### Colour Scheme

In my opinion, the colour scheme is important to this design as I wanted to represent the inspiration from deforestation through the colours I chose. I decided to use mainly grey to represent smoke and the gasses given off, contrasted with the greens of nature and reds and burnt oranges for the flames.

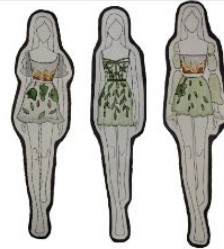
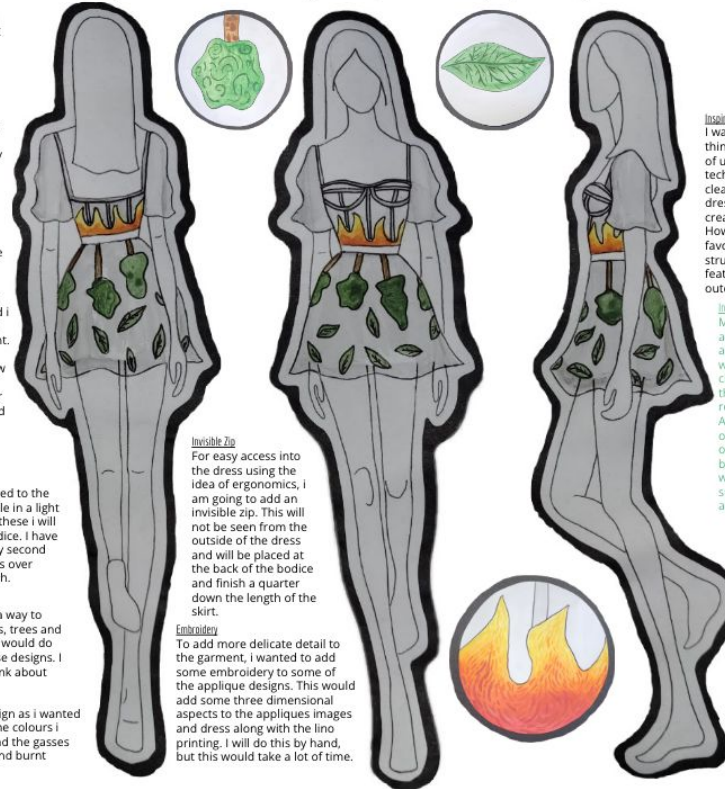
### Social Moral and Ethical

I will need to ensure that as I am making my garment I am also thinking about the moral, social and ethical impacts of my design. This would be making sure that I am in a safe environment and making something that will create little waste and impact the environment. As well as thinking about my clients safety and how it will impact her as well as if it is offensive.

This page is for my final design that I have created. I have used and thought about all my initial and development designs to help me to finalise one garment as well as using my clients opinion and preferences along the way. This is a final outlook on what my design will look like and will be what I will create for my client.

### Industry

If this dress was to be made on a large scale in industry some parts of the design might have to be modified to be quickly and easily carried out. One example of this would be lino printing onto small pieces of fabric before embroidering and sewing them on. This means that they would be done by hand and as this would take a long time to do, therefore increasing the price of the garment.



### Inspiration From Other Designs

I was mainly inspired by these three ideas when I was thinking about my final design. I liked my developed idea of using more graphic symbols, through design techniques, such as the fire, trees and leaves to show clearly my focus of the project. As well as the way the dress has been shaped around the bodice and skirt to create a flattering and feminine silhouette for my client. However, what led me to this design was my clients favourite aspects from each of the garments such as the structured bodice and draped sleeves, these were features that she loved and wanted to see in the final outcome.

### Inspiration From Nature And The Environment

My theme is nature and the environment and my client and I have decided to go down the root of deforestation and sustainability for the project. In my final design I wanted to create awareness for this global issue by using clear imagery of leaves, trees and flames, I also did this through the colouring of the design. Light grey was to represent the smoke and the gasses of the destruction. As well as this I wanted to think about the overall impact of this design on the planet. I will do this by using natural or recycled materials that I have thought about carefully before I include them in the garment. Another thing is waste and reducing as much as I can as well as making sure items are disposed of correctly all whilst thinking about the environment.

### Applique

As a main way in showing how my design has taken inspiration through nature and the environment and more specifically deforestation, I will use applique to show images of leaves, flames and trees. This is to represent the burning of forests that impact our environment through the release of carbon dioxide and the loss of photosynthesis being made. I will carry this technique out by hand and machine, by cutting each piece of coloured cotton and sewing it to the voile before ironing and adding bondweb.

### Final Client Consultation

Throughout the process of designing this final project, I have talked to my client about her wants and needs of the dress as well as parts that she likes and doesn't like and what she would want to include in the final design. My client loves this design as it fits her style and loves the way it has been inspired by a global issue to raise awareness of deforestation.



# Key Stage 5

## Paper Manipulation

Since my client liked the exaggerated silhouettes and pleats on my primary redesigns, I decided to pursue these elements further. I decided to use paper as a cheap and accessible material for experimentation as well as easy to manipulate as it keeps its shape quite well once folded.

This also links to the *paperie flexa* I researched on my contextual analysis.

I tried different necklines and skirts. I developed them by adding pleats inside lapels and pleated waistbands. I designed a long jacket and dress based on the paper manipulation.

This is what my client thought of it:

What do you think of this paper manipulation?

Read 19:51

I like the pleats and the shape of the neckline

When I sent my client all the photos of all my paper manipulation she said she liked the pleats and necklines. Because of this my designs heavily focused on pleats and I explored a conventional blazer neckline as well as a more atypical pleated wrap neckline on my dress design.

The top half of this design is like a conventional blazer with regular long sleeves, lapels and a button fastening at the waist. This is the same as my prototype.

The bottom half is composed of a long floor length pleated skirt. This is similar to my prototype but the pleats are sharper, longer and go all the way round rather than just being on the back.

What do you think of this design?

Read 20:30

I like the floor length skirt and the pleating of it

This design is made of a large piece of fabric which is completely knife pleated and wrapped round at a diagonal angle to create a dress. It is held in place with a belt that cinches around the waist. This would have to be made of a fabric structured enough to hold the shape of the pleats yet at the same time has good drape. This would be occasion wear so the aftercare and how hardwearing the fabric is wouldn't be as important as it wouldn't get worn as regularly.

My clients feedback to both designs shows that she likes longer designs. She also likes the pleating and silhouettes that cinch at the waist.

What do you think of this design?

A love the shape of the dress especially the belt pulling it in at the waist

I can document the rationale for my design decisions and fully justify these with constant reference bto my design brief, specification and investigations throughout the development of their design proposal. I can evidence ongoing development of design proposals, achieved through exploration of and experimentation with different materials, techniques and processes leading to an excellent quality design of a prototype for manufacture.

## Developing Ideas Toile 1 Construction Diary

Equipment:  
• Unpicker  
• Tailors chalk  
• Fabric scissors  
• Pins  
• Sewing machine  
• Thread  
• Calico  
• Interfacing  
• Iron  
• Ironing board  
• Marking

1. First I **labelled** different sections of the blazer bodice with pins and chalk to avoid confusion later when I partially disassembled it for the parts I wanted to keep.

A toile is a preliminary version of a garment also known as a prototype. It is used to trial and analyse if the garment would fit properly and work in practice the way it was designed to. This gives me the opportunity to pick up on any faults and problems I could encounter if I were to make this garment properly that I wasn't aware of previously. The toile makes it much simpler to fix any problems that can occur than it would be when constructing the real garment as calico is a durable and sustainable fabric. This means it's easier to manipulate repeatedly till the desired effect is reached without having an immense negative effect on the environment as you would by wasting large quantities of a fabric that is more difficult to recycle, requires more energy to make or uses finite resources. Also calico is cheaper than most other fabrics meaning it would be more costly to fix any faults without a prototype. This toile was made to test my redesign of a primary existing product.

2. Since my design has lapels, I started by deconstructing the existing blazer above to use as pattern pieces. Once I had the pieces, I wanted to accurately cut them out in calico with a 1.5cm seam allowance around them. I accurately and securely pinned the front and back of each lapel (good sides facing inwards) before sewing them together with a straight stitch length 2, ensuring at either side, I carefully cut of excess from the seam allowance to make it easier to turn them out onto the right side. Then, once again using a straight stitch length 2, I pinned and secured at either end and accurately topstitched round the outer edges.

3. Then I accurately cut out the collar pieces in calico with a 1.5cm seam allowance however I added an extra 1.5cm to the top of the collar (the seam allowance) so that it had a bit more volume than it did on the blazer. To add some extra structure to the collar, so that it would keep its shape, I cut out interfacing in the same shape as both collar pieces and carefully ironed it on. Just like with the lapels, I accurately and securely pinned the front and back of the collar (good sides facing inwards) before sewing them round with a straight stitch length 2, ensuring at either side, I carefully cut of excess from the seam allowance to make it easier to turn them out onto the right side from the bottom edge that I left open. I pinned and accurately topstitched all edges except the bottom edge with the same stitch. Then I attached the lapels and collar together with a neat and even slip stitch ensuring that I had pinned it accurately and securely.

4. Then I started making the bodice of my prototype using draping on the stand. First of all I cut out 2 squares of calico (24x24 inches), one of which I pinned onto the front of my mannequin garment. I drew the centre front of the pattern and the profile of the fabric, with a ruler and tailors chalk. I checked I was doing the centre and a straight, clear, add line. Then I started working on one side of the bodice block on the mannequin identifying the bust point and bustline and marked the waistline with a 1.5cm seam allowance making sure all pattern markings were clear and correctly marked. Next I sculpted my darts, eliminating any excess fabric, pinned the waist darts and butt darts. Once secure, I marked either side of the dart with tailors chalk clearly. Then I unpinned the prototype from the mannequin and carefully pinned it in half on the centre front to ensure both sides were even. I checked dart markings were clear before unpinning them and proceeding to put tailor tacks in the darts so that I was able to mark the same darts on the other side to create a symmetrical bodice. I checked that the tailor tacks matched my dart markings and transferred all the markings to the other half so they were identical. Here I ran into a minor issue when my waistline wasn't straight so I washed it off with water and drew the new one with a ruler and tailors chalk. I pinned, tucked and sewed the darts in with a straight stitch length 2, ensuring at either side and ensuring all lines, tacking and sewing was accurate and secure. I pinned the front back on the mannequin and added any markings I was missing like the armholes, sides and shoulder lines with a 1.5cm seam allowance cutting off any excess. Next I pinned the other square of fabric to the back of the mannequin and repeated a similar process pinning, accurate and clear markings on half of the fabric like the centre front, waistline and armholes, sides and shoulder lines with a 1.5cm seam allowance cutting off any excess. I pinned my front and back off the mannequin and pinned and sewed the shoulder and side seams with a straight stitch length 2, ensuring at either side making sure they were pinned straight, securely and accurately. I cut down the centre front line of my bodice to attach my lapels to the front of the garment. Since it was in the top, near the collar, I removed any excess fabric. I sewed them together with a small zigzag stitch. If I was doing this for the real garment I'd add 1.5cm seam allowance on either side of the collar to fold over as I had an exposed edge that I feared a lot and ruined some of the aesthetic appeal of the garment as well as its durability.

5. Once the lapels were attached to the bodice I attached the collar with a neat length 2 straight stitch, ensuring at either end and ensuring all stitching and sewing was accurate and secure. I pinned it in place before using a straight stitch length 2, ensuring at either side.

6. I carefully made small cuts in the armhole seam allowance so that it was easier to fold. Then I accurately and securely pinned it in place before using a straight stitch length 2, ensuring at either side.

## Developing Ideas Toile 1 Construction Diary

7. Next I started working on the 'skirt' of the garment. I pinned out 2 squares of calico (24x24 inches). I pinned one to the front of the mannequin ensuring it was straight and secure. I drew the centre front of the pattern with a ruler and tailors chalk. Checking I was doing the centre and a straight, clear, add line. Then I marked the waistline with a 1.5cm seam allowance making sure all pattern markings were clear and correctly marked. Next I sculpted my darts, eliminating any excess fabric, pinned the waist darts and butt darts. Once secure, I marked either side of the dart with tailors chalk clearly. Then I unpinned the prototype from the mannequin and pinned it in half on the centre front to ensure both sides were even. I checked dart markings were clear before unpinning them and proceeding to put tailor tacks in the darts so that I was able to mark the same darts on the other side to create a symmetrical bodice. I checked that the tailor tacks matched my dart markings and transferred all the markings to the other half so they were identical. Once I had created the shape I wanted with the skirt, I used them as accurate pattern pieces for a skirt with eliminated darts.

8. I used the pattern pieces I'd created to cut out a new skirt from without darts. Once I cut it out, I marked the centre front with a straight, clear, add line, and accurately cut down the line as the design dictated. I opened front. If making this for the real garment I would need extra fabric for the seam allowance that would connect to the lining. I modified the skirt back pattern before cutting it out to account for the extra fabric I'd need for the pleats. I added an extra 10cm for each pleat. This was because each pleat was 5cm wide and I had to double it since they are folded under once I had made it. I used my new modified pattern (labeled all my pleats accurately and checked the waist measurement still matched the original pattern as it fit would remain the same). I sewed my pleats with a straight stitch length 2, ensuring at either side making sure they were pinned straight, securely and accurately. I pinned the skirt front and back with the same stitch making sure to leave a 1.5cm seam allowance and cut off any excess.

9. Next I joined the bodice and the skirt together. I aligned the centre back of the bodice and skirt and pinned them together from that point until I got round to the front. Once I accurately and securely pinned all the way round, I used a straight stitch length 2, ensuring at either side, and secured at either side. By joining these pieces together I was able to conceal the bottom of the lapels I had made previously underneath. To make sure the front looked seamlessly pinned I used bias binding across the edges of the line way down to create one seamless line concealing this securely.

10. At this stage I was able to get my client to try on the prototype. She said she liked the shape and felt the fit of the developed into something she would like to wear. She seemed comfortable and allowed her a good quality of motion but stated she would prefer it with sleeves.

11. I got all of my client's relevant measurements to make a well fitted dress. These measurements are: Waist, elbow, bicep and cap/under arm circumference, Length from cap of shoulder to bicep, elbow and wrist, Sleeve length from bicep to wrist and these measurements to draft a sleeve pattern. I first sewed a sample for my client to try on separately before a version that I attached to the prototype.

Sleeve pattern drafting:

- Measure sleeve length into onto piece of spot and cross
- Mark the head and top of the sleeve and the bottom of the sleeve.
- Mark centre line down the centre of the sleeve
- Mark bicep from the head of the sleeve (head is top of shoulder)
- Find middle point between bicep and wrist this will mark the elbow mark (draw a line across to mark it)
- Check accuracy - measure from the head of the shoulder to the elbow mark (double measurements are accurate)
- Mark circumference of bicep (double total circumference by 2 adding the equal split of measurements on either side of the line)
- Repeat the same for the elbow
- Repeat the same for wrist
- Connect all points down the outer edge of each side to form the edge of the sleeve, when you reach the bottom line the bicep points to the centre of the head of the sleeve

- Mark front half and back half of sleeve (split sleeve in half)
- Measure from the head of the sleeve to the bicep point. Check the length by eye. Mark the middle point between the head of the sleeve and the end of the bicep line
- Measure between the centre mark you have just made and the head of the sleeve and mark the middle point. Repeat and mark the middle mark between the centre and the bicep mark.

Forming the sleeve head:

- Sleeve Front: Mark 0.8 inches above the top mark (between head and bicep mark)
- Mark 0.3 above centre mark
- Mark 0.5 inch on the inside of the bottom point on the bicep line
- Connect all the dots marked above, starting at the head of the sleeve, following only on through the 0.8 inch mark, 0.3 inch mark and inside 0.3 inch mark
- Sleeve back: Repeat for the back half of the sleeve however marking between the head of the sleeve and top mark at 0.8 inch, the centre mark at 0.3 inch and the bottom mark between the centre and bicep mark at 0.4 inch on the inside. (Back pattern always have slighter notch up bicep pattern to sleeve pattern to ensure both patterns fit together accurately)
- Add 1.5 seam allowance around the edge.

Client fitting:





# Progression in Textiles Technology

## Classification of Materials





# Key Stage 3



I can identify materials and their working properties.

I can define the performance of materials and what is required in order to achieve functioning solutions.

## Materials Jevgenija

Definitions:			
Fibre: Fibre is a long, thin strand or thread of material. Fibres are flexible and may be spun into yarn and made into fabrics.			
Fabric: Cloth produced by weaving, knitting or bonding textile fibres.			
Natural - Cellulosic (Plant/vegetable)	Natural - Protein (Animal)	Regenerated	Synthetic
<b>Definition:</b> These fibres are produced from plants and vegetables. They can be matted to make paper or felt.	<b>Definition:</b> These are fibres that are produced from using fur, skin, hair or animal larvae.	<b>Definition:</b> A mixture of natural and man made.	<b>Definition:</b> These are made from petrochemicals by humans through chemical reactions.
<b>Examples:</b> Cotton, Bamboo, Linen	<b>Examples:</b> Wool, Cashmere, Silk	<b>Examples:</b> Rayon, Viscose, Modal, Lyocell, Tencel	<b>Examples:</b> Polyester, Acrylic, Nylon, Lycra

### S1 Consolidating:

Identify a range of fibres and describe the fibre group they belong to.

### S2 Developing:

Explain the properties of a range of fibres.

### S3 Stretch and Challenge:

Justify the suitability of different fibres by comparing their properties

## Materials

### Fabric Construction:

Definition: Fibres must be twisted spun together to make yarn before they can be made into a fabric.



Woven






Knitted



Non Woven (Bonded)

### Year 7 Projects

Fibre Group:	Fabric Construction:	Properties:	Used for:	Suitability:
Calico 	Natural Plant Woven	Durable Recyclable Breathable Absorbent Biodegradable		T-shirts Bags Bedding
Ripstop Nylon 	Synthetic Woven	Very Durable Wind Proof Grease Resistant Abrasion Resistant Fire resistant Light weight Doesn't let air through		Bag Waterproof jacket
Felt 	Natural Animal Non Woven (bonded)	Soft Light weight Absorbent Good insulator Blocks air		Keyring Cushion (decorating)

### S1 Consolidating:

Identify a range of fibres and describe the fibre group they belong to.

### S2 Developing:

Explain the properties of a range of fibres.

### S3 Stretch and Challenge:

Justify the suitability of different fibres by comparing their properties

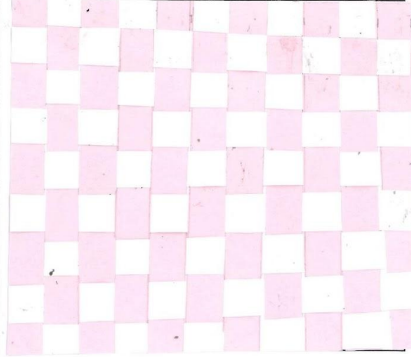
# Key Stage 3



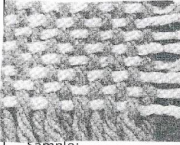
I can investigate materials and their working properties in more detail, by exploring and understanding the categorisation of the types.

I can explain the physical properties in relation to the classification and utilise this knowledge when selecting appropriate materials.

WEAVE: plain weave



Cotton, linen, calico. ~~3~~  
 Plain weave is the most basic of three fundamental types of textile weaves. It is strong and hard, wearing, used for fashion and furnishing fabrics.  
 In plain weave, the warp and weft are aligned so they form a simple criss-cross pattern.



Sample:




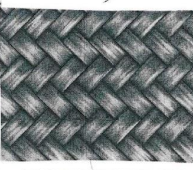

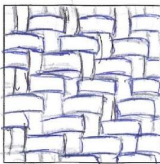


Diagram:

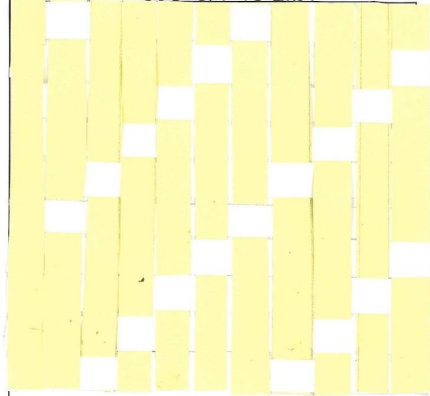
WEAVE: Twill weave



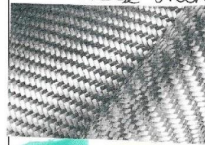



Denim, chevron, herring bone.  
 Twill is a type of textile weave with a pattern of diagonal ~~parallel~~ parallel ribs. This is done by passing the weft thread over one or more warp threads then under two or more warp threads and so on. Twill generally drapes well.

WEAVE: Satin weave



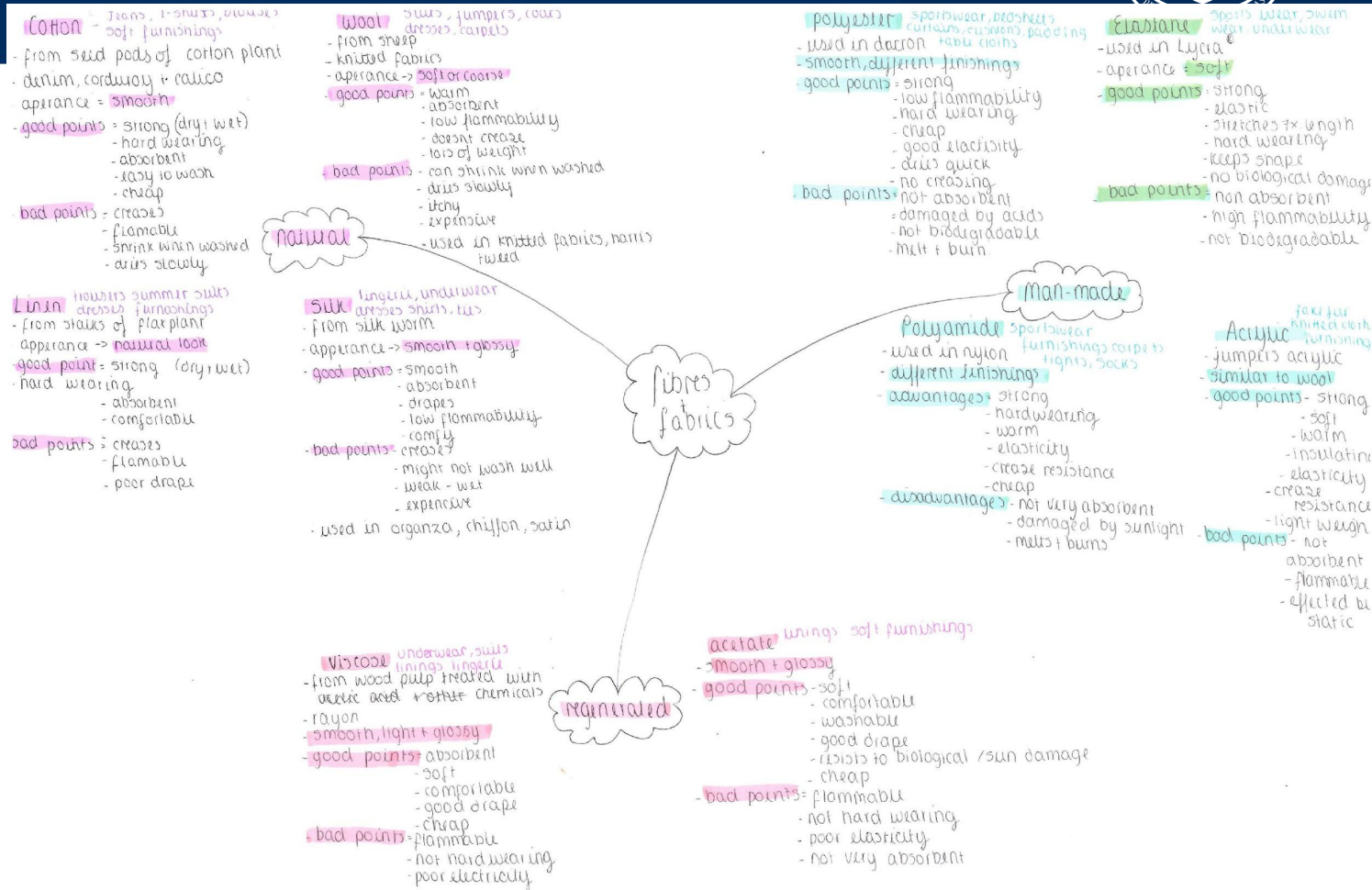
curtains, ribbons & evening wear  
 Satin is a fabric made using a satin weave structure but made with spun yarns instead of filaments. The sheen and softer feel of satin is produced through the satin weave structure. four over and one under. reduces light scattering to increase shine, smooth to the touch.

# Key Stage 3



I can explore in some detail the categorisation of materials and their working properties in relation to the physical properties and sources.





# Key Stage 4

I can demonstrate advanced understanding of specific materials for a wide range of applications, in addition to being able to provide detailed and justified explanations of why specific materials and combinations of materials are suitable for given applications with reference to: • physical and mechanical properties and working characteristics • product function • aesthetics • cost • manufacture and disposal.

## Fabric Construction - Yarns

Yarns made from one strand is a compound yarn  
When spinning yarns it is impossible to get a regularity in thickness  
↳ irregular yarns need to be processed to improve performance

### Single

- ↳ one yarn - continuous filaments
- ↳ spun one yarn with a Z twist
- ↳ easy to make and inexpensive
- ↳ Not even thickness - weak spots spots



### Folded (Piled)

- ↳ Two or more single yarns twisting together - thicker and stronger yarn
- ↳ Better quality fabric - even out thick and thin spots
- ↳ More lustrous



### Cable

- ↳ More than one operation
- ↳ 2 or more folded yarns are twisted together
- ↳ Stronger, stiffer and more likely to be used for industrial applications



### Novelty/fancy

- ↳ Decorative yarns
- ↳ Used in knitted and woven purposes
- ↳ Give interesting effects
- ↳ Add texture, more insulation, take moisture from body
- ↳ manipulate with heat (crimps, crinkles and snags) with thermoplastic properties - becomes permanently set



### Bourette / Knop yarn

- ↳ bunches occur at certain intervals
- ↳ formed during carding, spinning or feeding

### Buckle / Loop yarn

- ↳ Special feeding process which results in waves or loops
- ↳ Textured surface

### Chenille

- ↳ Cut pile yarn - Soft and voluminous
- ↳ Made by cutting special fibres into strips
- ↳ Furnishing and knitwear

### Crepe

- ↳ Yarn with a crinkled surface - highly twisted yarns
- ↳ Soft and light

# Key Stage 4



## Fibre Testing:



Fibre testing is a way to test a variety of fabrics such as heat, hydrophobicity, fray and abrasion. The fabrics I used is calico, voile, ripstop nylon, silk, polyester and felt.

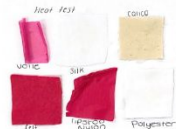
Fabric testing is used for a variety of reasons like finding the quality, how good? How durable? Etc. I found that the synthetic fabrics were more durable than the organic apart from voile which ripped and worn away in the abrasion test, where as ripstop nylon has little to no change which tells me that it is very strong. Throughout the testing I did find that ripstop nylon to be the least impacted but further into the testing the heat melted away the fabric due to it been a synthetic fibre which is plastic based and heat melts away plastics. I used both natural and synthetic fibres. Synthetic are usually bad for the environment because they're made chemically resulting in bad toxic gasses been released into the earth's atmosphere causing CO<sub>2</sub> gasses. They're also plastic based which yet again impacts the environment because they aren't non biodegradable.

The rest of the fibres I have tested are natural which are silk, felt and calico. These fabrics are made without chemicals, mainly coming from plants and animals. Silk (which is created by silkworms) is 100% natural. Fibre testing is a important part of production and manufacturing because it can be used to test the quality and durability of the fibres. It also can be used to increase the quality of the product if the manufacture is wanting a high quality product. If quality control isn't completed then the product would not be up to scratch and break when been used which could result in a poorly made product which the consumer will not want. Additionally, the designer and the manufacturer might get a bad reputation in the industry due to the poor quality of the products resulting in to customers.



This is the hydrophobicity test this is where you're testing the water repellent of the fibre, to carry out this test place droplets of water onto the fibre and watch to see if it absorbs or repels the water. I found that the natural fibres all absorb the water except calico, were the water rested on top of the fabric. Out of both natural fabrics silk was the most absorbent. On the other hand voile and ripstop nylon repelled the water because they are synthetic, but surprisingly polyester absorbed the water faster and more than the natural fibres.

This is heat test, heat testing is to see how the fibres react with heat. To perform this test you need a heat source such as an iron and turn it on a medium to low heat, place the iron onto the fibres and hold for 1-2 minutes, take off the iron and see what's changed. All of the synthetic fibres which are ripstop nylon, voile and polyester, melted melted due to there plastic base but polyester didn't react like the other synthetic fibres because it bruen around the edges like a natural fibre would. The natural fibres stayed intact and didn't really react. Felt on the other hand slightly burned and went brown as wool is from sheep and it is very hair like causing it to be very fragile. From this test it showed me that natural fibres would be good if you wanted a heat resistant product but ripstop nylon and voile would not be suitable.



**I can demonstrate an in-depth understanding of the classifications of all groups of fibres, the manufacturing processes used to make fibres in relation to the fibre source (with specific reference to staple fibres and continuous filament fibres) as well as thorough knowledge of fibre, yarn, fabric construction and the engineering of fibres and justification of all of the above in relation to fibre performance and suitability.**



This is the fray test. The fray tests is basically to see the strength of the fibre when its been stretched, pulled and tension is put onto it. To carry out this test I got each fabric one by one and pulled away at one edge multiple times and repeated on the other side but this time cut the side with pink scissors to see if it would have an effect-and I found that it did on all of the fibres. Silk was mostly affected on this test due to it been woven which can be easily pulled apart unlike ripstop nylon which did not fray at all. Ripstop nylon is a tightly woven fabric witch as beneficial in this test as the tightly woven fibres didn't move or budge and didn't fray at all, this proves that this is the strongest out of them all in this test with silk and polyester been the weakest as silk is warp woven meaning its loosely woven opening a disadvantage for fraying. Although silk proved the worst it is very good for draping and is used for elegant garments.

The last test I carried out was the abrasion test using silk, ripstop nylon, calico, felt, voile and polyester. To carry out this test I got a piece of sandpaper and rubbed, scrapped and pulled it over the fabric individually. This proved that ripstop nylon was the most durable as it is a tightly woven fabric but voile on the other hand ripped and worn away the worst and got holes ripped into it, this happened due to it been lightly woven making it the weakest. All of the fabrics reacted to this test including all the natural and synthetic. If your opting for a durable fibre use ripstop nylon.

Designers carry out these sort of tests to see what fibres are suitable for their products they are wanting to create. It also is a way of quality assurance making sure the fibres and their products will be durable and past the standards of the consumers wants and needs. Out of all these tests I carried out is ripstop nylon was the strongest even though it didn't pass the heat test, usually synthetic fibres are stronger due to how they are made, plastics are usually stronger fabrics as they withstand a lot of damage and have plenty of resistance. The downside to synthetic fibers are they are not great for the environment out weighing there good properties they also go against the 6rs (Rethink, Refuse, Reduce, Reuse, Recycle, Repair).



# Key Stage 4

I can demonstrate the development of advanced, high level understanding of specific materials for a wide range of applications and support this with in-depth knowledge of the classifications of all groups of fibres, the manufacturing processes used to make fibres in relation to the fibre source (with specific reference to staple fibres and continuous filament fibres) as well as thorough knowledge of fibre, yarn, fabric construction and the engineering of fibres and justification of all of the above in relation to fibre performance and suitability.

## Exam Questions

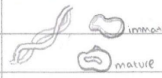
1) a) Silk is the only natural long continuous filament. It has a smooth, straight structure. This means it drapes well due to its straight structure. It has a natural lustre because light reflects well off the smooth fibres. As it is natural, it absorbs moisture so is comfortable to wear. Because it is a delicate fibre, it creases very easily.



b) Wool has a scaled structure with overlapping scales. Wool is warm and insulating as air is trapped between the layers. These layers can hook together and lock in place if exposed to damp heat, which is when wool shrinks. There is natural grease between the layers, trap air and moisture which keeps it warm. Wool is dull as its scales mean that light does not reflect properly. Due to the fibre's natural grease and layers, wool is initially water repellent but it will absorb water after a while.



c) Cotton is a staple fibre taken from a cotton plant. Its structure is naturally twisted meaning it has a dull lustre as the light is refracted rather than reflected. It also is very absorbent due to its cell wall which absorbs moisture and heat. This means that cotton is insulating and dyes well. It creases easily because the twisted structure means that the fibres naturally twist.



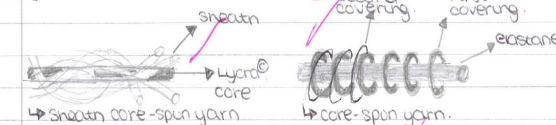
d) Viscose is a regenerated fibre made from wood pulp and made into a fibre using chemicals. The fibre is straight which gives viscose a good drape as it naturally hangs straight however a good cross section it is a delicate fibre meaning it can crease easily but finishes can be added to reduce this. The cloud-like cross section of viscose gives it a high absorbency meaning it will dye well but may take longer to dry.



Explain the reasons why yarns might be core-spun, and describe two different methods of core-spinning yarns. You may use diagrams in your answer (7 marks)

Yarns might be core-spun because core-spun yarns are 40% to 50% stronger than normal spun yarns and the number of broken stitches when sewing seams and hems on denim are reduced. These properties of core-spun yarns are due to the creation of core-spun yarns via twisting staple fibres around a central filament core.

There are two types of core-spun yarns; sheath core spun yarns and a core-spun yarn.



The stretched elastane fibre is covered by a sheath of non-elastic fibre which can be natural, synthetic or blended. The strands are wrapped in opposite directions to balance the yarn.



Plain weaves

4 under 1, over 1  
4 strong, poor drape

Twill weaves

4 under 2, over 2 - diagonal pattern  
4 stretch + movement

Satin/sateen

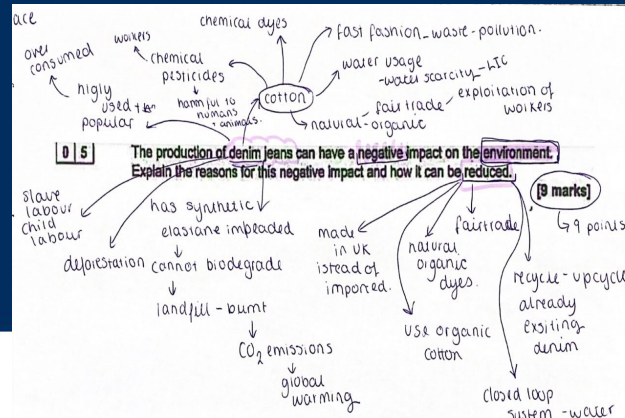
4 over 4, under 2  
4 movement + drape





# Key Stage 5

I can demonstrate the development of advanced, high level understanding of specific materials for a wide range of applications and support this with in-depth knowledge of the classifications of all groups of fibres, the manufacturing processes used to make fibres in relation to the fibre source (with specific reference to staple fibres and continuous filament fibres) as well as thorough knowledge of fibre, yarn, fabric construction and the engineering of fibres and justification of all of the above in relation to fibre performance and suitability.



1 3 Explain the different processes that need to be followed when preparing cotton fabric for dyeing and printing. (6 marks)

Firstly, the fabric must be scoured, this removes any oil or impurities that occur in a natural fibre. Then the fabric is mercerised. This involves the fabric being put in a bath of caustic soda to makes the fibres swell, which increases their absorbency and then shrink to become smooth. The fibres are then desized which removes any natural starch from the fibre. The fabric is then bleached to remove its natural colour so the dye will be brighter and more saturated. Lastly the fabric is put in a steamer. This relaxes the fabric's warp and weft to 70° to ensure that the fabric has not become misshapen in the processes. These processes are done to natural fibres, just cotton, as they aren't made specific often include impurities and oil remaining sources and unlike synthetics cannot receive dye directly from source.

*Cotton process expert - Catherine*

Explain how synthetic and manmade fibres can be engineered to improve the properties of the fabrics made from them. (6 marks)

Fibres can be blended to improve their properties. For example, a cotton polyester blend will improve its stretch because of cottons ability to be breathable and its stiffness, polyester is easy to crease. Manmade fibres are often engineered to create textured yarns which improves their stretch and texture. This can include creating a BCF or knit-de-knit yarn to create a false twist or crimp to improve the fabrics texture and stretch. This is done to synthetic fibres as, because of their thermoplastic properties, they can be set to hold this texture. Texturing can be applied to staple fibres when giving this involves applying heat and tension to the fibre on a cold surface making its fibres stand up - this improves the fibres ability to trap air and make it more insulating - this can be applied to natural fibres as it doesn't rely on a fibre being thermoplastic. When synthetic fibres are spun they can be given different properties by changing the shape of the holes in the spinnerette to change their structure.

Turn over for the next question

*Wonderful Cathie*

1 5 Explain how ceramic and carbon fibres can be used to enhance fashion and textile products. (6 marks)

Ceramic fibres are both strong and lightweight. It also has high resistance - can resist heat up to 1000°C. This makes ceramic fibres good for temperature regulators, therefore, ceramic fibres are often used in the insulation industry and can be used in garments to regulate body temperature. Carbon fibres are also strong - 10x stronger than steel and are very thin and lightweight. Thus, carbon fibres are often used in aerospace and military as they are incredibly strong. Carbon can also conduct electricity so are often used in garments that include electrical components like GPS or heart rate monitors.

*Excellent and well thought out - Catherine*

- Ceramic fibres give UV protection
- Carbon includes carbon

13 The production of denim jeans can have a negative impact on the environment. Explain the reasons for this negative impact and how it can be reduced. (9 marks)

Denim jeans are made from a blend of cotton and elastane. This means that, because of the synthetic element, the fabric cannot biodegrade and will eventually end up in landfill. This could then be burnt which creates CO2 emissions and contributes to global warming. The cotton in denim, although is a natural fibre, can be very bad for the environment. When cotton is grown, chemical pesticides are used to prevent the plants from being eaten. However, these pesticides are harmful for animals as well as humans and can be toxic for workers in these conditions. The pesticides also can pollute water sources similar to chemical dyes. This is bad as water sources will no longer be able to use as they are toxic for animals & humans. This is especially bad for low income countries as water scarcity is a life threatening issue. To grow and produce cotton, a lot of water is used, waste that may be needed for people to use is used up by growing cotton & can be polluting. A solution to this is closed loop manufacture, where the same amount of water & dyes are used over and over again. Some other environmental impacts could be reduced by using natural organic dyes which don't have toxic chemicals in them, recycle & upcycling already existing denim products into something new and by fairtrade branded products to ensure workers have been paid fairly and in safe working conditions.

Turn over





# Progression in Textiles Technology

## Development of specialist and technical skills



# Key Stage 3 - Year 7



**I can demonstrate basic practical skills and show understanding of how to use appropriate tools, equipment, machinery and materials.**



# Key Stage 3 - Year 8



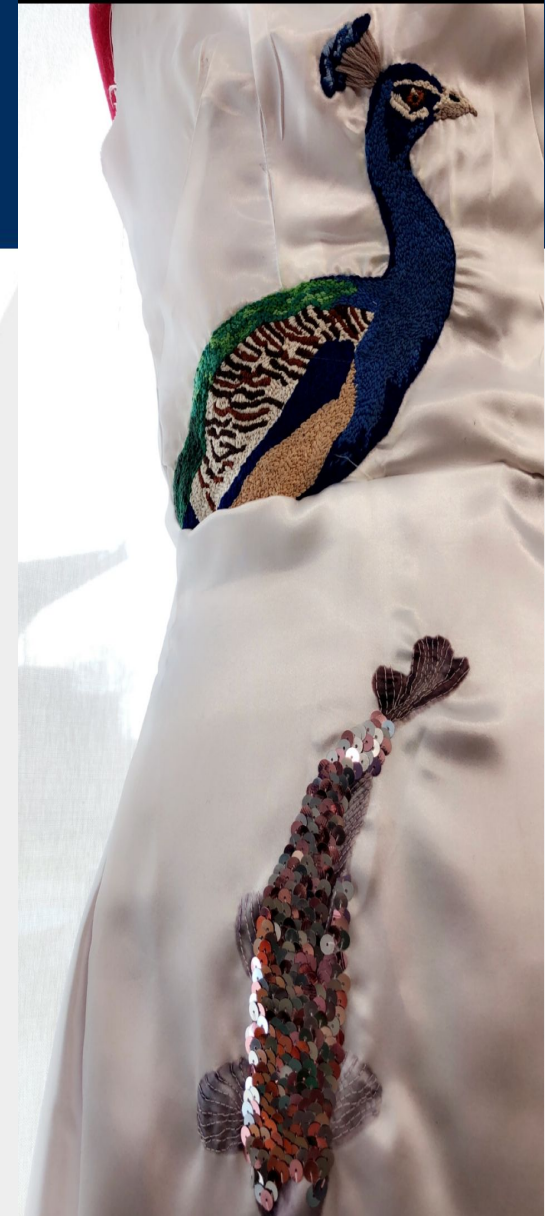
**I can demonstrate a range of practical and manufacturing skills and how to further use appropriate tools, equipment, machinery and materials.**





# Key Stage 4 - Year 10

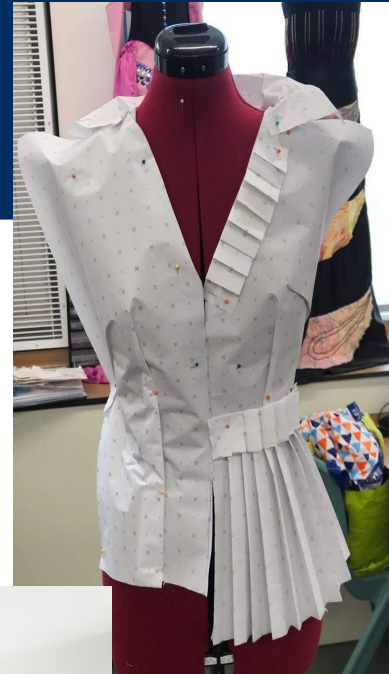
**I can demonstrate and develop a wider range of specialist practical and manufacturing skills and how to further use appropriate tools, equipment, machinery and materials with accuracy, working towards understanding how to create and develop commercially viable products.**



# Key Stage 4 - Year 11



I can independently, with some precision demonstrate specialist and technical practical and manufacturing skills and processes, and how to independently use a range of appropriate tools, equipment, machinery and materials to produce a commercially viable product.





# Key Stage 5 Yer 12-13

**I can innovatively demonstrate in-depth and significantly complex, specialist and technical practical and manufacturing skills and processes. I can independently demonstrate dimensional high level, accuracy and precision with a wide range of advanced tools, equipment, machinery and materials to produce a high-level, commercially viable product.**





