

# What are textiles?

## Here's a dictionary definition:

**Textiles** – natural or synthetic (man-made) fibre products in the form of **yarn, fabrics, garments or other manufactured articles.**

## Where do we find textile products?



# Fibre tree

## The Fibres Tree

Fibres come in different lengths

Staple: fixed short

Filament: continuous

## Fibres



## Natural

## Synthetic

## Plants (cellulose)

## Animals (protein)

## Regenerated

## Man Made

Cotton

Wool

Viscose

Polyester

Linen (flax plant)

Silk

Acetate

Nylon

# Materials.... Natural fibres



Origin: Seed bolls of the cotton bud

Staple fibre

Natural Vegetable

**Cotton**

Description: A cheap but strong and cooling fabric, which creases fairly easily.

Fabrics: Denim, towelling, gabardine, cotton jersey

Properties: Strong, soft, absorbent, durable, low elasticity, creases easily, fairly cool, high flammability

End uses: Soft furnishings (often mixed with other fibres), jeans, shirts, bed linen, underwear



Origin: Stems of the flax plant

Staple fibre

Natural Vegetable

**Linen**

Description: Even stronger when wet, very cooling but creases easily, can be itchy

Properties: Strong, absorbent, durable, low elasticity, creases easily, fresh & cool to wear, high flammability

End uses: Summer clothing, table and bed linen. It's sister fibre Hemp is used for sacks and rope.



Origin: Fleece from various sheep

Staple fibre

Natural Animal

**Wool**

Description: A soft, hardwearing fabric that is unlikely to crease much

Fabrics: Tweed, jersey, flannel

Properties: Has good elasticity, very warm (air between fibres traps heat) crease resistant, absorbent, ok flammability, not very strong or durable, can shrink

End uses: Winter hats, socks, jumpers, suits, carpets



Origin: Cocoon produced by a silk worm

Natural Animal (protein)

**Silk**

Description: An expensive fabric that is smooth to touch, it drapes very well and has a lustrous appearance

Fabrics: Chiffon, satin, taffeta

Properties: Strongest natural fibre, weaker when wet, dyes well, insulating, static, absorbent, durable, creases drop, average flammability

End uses: Luxury products such as wedding dresses, ties, sleepwear, waistcoats

Filament fibre

# Materials.... Synthetic fibres

**Note:** All fibres are filament and can be cut into staple fibres

## Polyester

**Manufactured Synthetic**

Origin:

Chemicals from oil are polymerised

Properties: Strong, low warmth, poor absorbency, dries quickly, durable, good elasticity, crease resistant, fairly cool, can be recycled

Description: A good all round synthetic, which is often blended with cotton to add crease resistance

Fabrics: Can be manipulated to imitate other fabrics: Satin, cotton, mixes

End uses: Clothing, bedding, soft furnishings, linings for clothing

## Microfibres

**Manufactured Synthetic (polyester/nylon)**

Fibres 60-100 times finer than human hair

Origin:

Chemicals from oil are polymerised

Properties: Strong, absorbent, average durable, good elasticity, average crease resistance, warm, low flammability

Description: These tiny fibres can be woven so closely that they can prevent penetration by water whilst allowing the fabric to breathe. Can be blended with nat/syn fibres

End uses: Sports wear, interlinings for winter coats, tents, underwear  
Lycra (blended), Tencel (regent)

## Nylon

**Manufactured Synthetic**

Origin:

Chemicals from oil are polymerised

Properties: Warm to wear, breathable, repels rain, soft, can shrink, good drape, creases drop, crease resistant, durable, low flammability

Description: Like polyester, it is a strong and crease resistant material. Its toughness makes it suitable for carpets

End uses: Skirts, carpets, underwear, stockings, kite material

## Viscose (Rayon)

**Manufactured Regenerated**

Origin: Cellulose extracted from wood pulp

Properties: Average strength, poor elasticity, absorbent, low durability, cool, low flammability

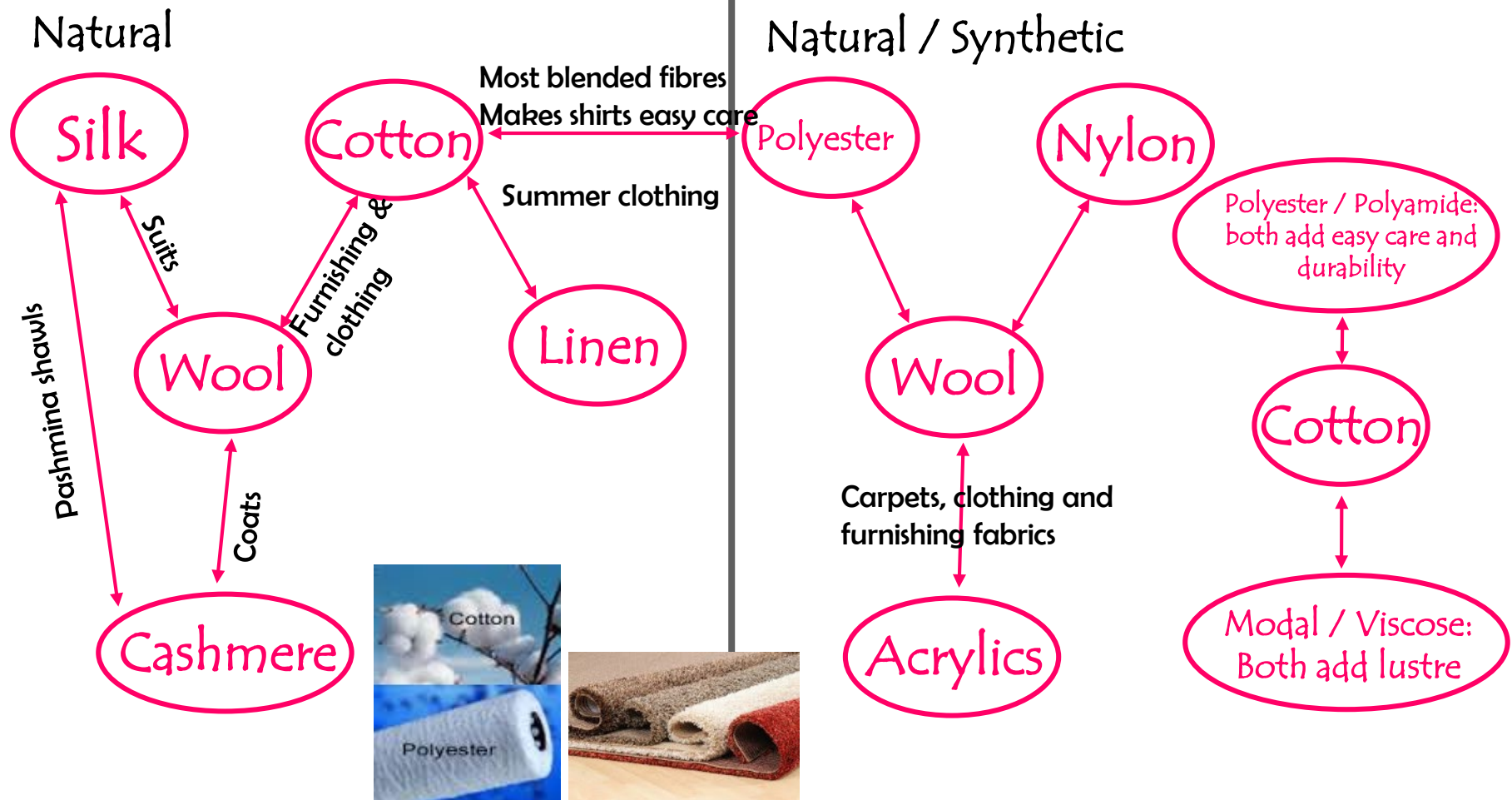
Description: Referred to as synthetic silk. Used for lightweight clothing

Fabrics: Chiffon, satin, taffeta (synthetic)

End uses: Cheaper alternative to silk: Luxury products such as wedding dresses, ties & sleepwear

# Materials ... Blending fibres

Blending fibres improves quality, the good properties of each are combined together. Aftercare is also improved, for example shrinkage. Blending also improves the appearance such as the colour and drape of the material, it can also improve profitability eg: fibre cost, fibre supply.





# Materials... Special Properties

Manufacturers often use fibres, yarns and fabrics that have been enhanced or have built in qualities. Cyclists need to wear shorts that are comfortable, stretch but also keep their shape. These shorts will need a high level of elastane. These qualities can be added to the product once it has been made

## Tencel

Tencel (brand name for lyocell - Regenerated) is produced from wood pulp. It was developed in the US in 1987. The fibre is made from tiny fibrils and is used for all kinds of garments including suits and underwear. Properties: soft, absorbent, very strong wet or dry, crease resistant, can be washed in many different ways, good drape, can be dyed many colours. Can look like suede, leather & silk

## Lycra

Lycra is the brand name for elastane / spandex / elastomeric. Lycra is a synthetic rubber fibre, the elastane gives it very high stretch as one of its properties. The stretch is known as extension of elasticity. It is mostly used in sportswear and underwear however you will also find it in suits, jeans and other products you may wear.

Lycra is a micro fibre and always blended with another. For example often blended with cotton to make denim with 5% lycra for comfort and stretch.

## Kevlar

This is a very hardwearing material. It is known as a composite fabric and is produced using chemicals. It can be stiffened up or as a soft fabric depending on the end use. It is five times stronger than steel.

End use: gloves, protective jackets, bullet proof vests

<http://www.bbc.co.uk/schools/gcsebitesize/design/textiles/fabricsrev4.shtml>

# Cycling jerseys need to be breathable

## Choosing materials

It is important to choose materials that are **fit for purpose**. Choosing a fabric with the appropriate quality and cost will ensure that a product will suit the target market. When making fabric choices, ask yourself the following questions:

- **Fibre content:** should you use natural or synthetic fibres?
- **Fabric construction:** should you use woven, knitted or non-woven?
- **Manufacturing processes:** should you use dyeing, printing, mechanical finishing or chemical finishing?
- **End use of the fabric:** what are you making, eg jeans, sportswear or a seatbelt?
- **Maintenance:** what are the aftercare requirements of the product?

The fibre content, fabric construction and finishing processes determine the fabric's aesthetic, functional and comfort properties.

## Properties of fabric

- It is important to match fabric properties to the requirements of the product. For example:

**Cycling jackets** need to be made from fabric that is warm, breathable, elastic, windproof and water resistant.

**Children's jumpers** need to be made from fabric that is soft, colourful, stretchy, warm and easy care.

**Seat belts** need to be made from strong, durable, flame-resistant materials.

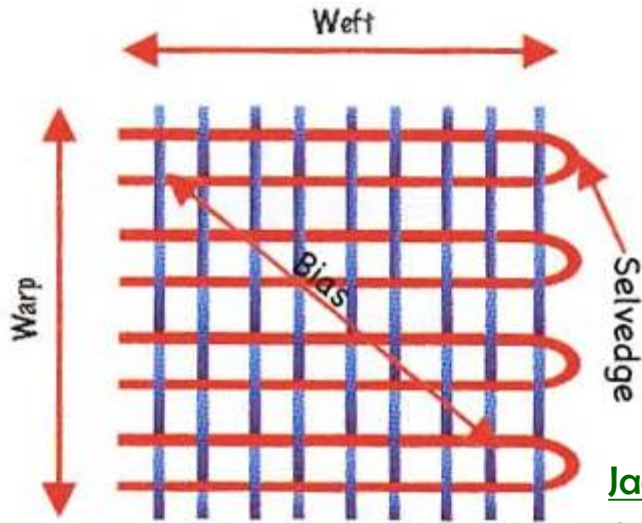
**Fire-protective clothing** needs to be strong, durable, flame resistant and water resistant. It may also need to be breathable and elastic.

**Geotextiles** need to be strong and durable so they stop embankments from slipping.



Aesthetic properties	Functional properties	Comfort properties
<ul style="list-style-type: none"> <li>•handle</li> <li>•drape</li> <li>•colour</li> <li>•appearance</li> </ul>	<ul style="list-style-type: none"> <li>•strength</li> <li>•durability</li> <li>•crease resistance</li> <li>•flame resistance</li> <li>•stain resistance</li> <li>•water resistance</li> <li>•aftercare</li> <li>•cost</li> </ul>	<ul style="list-style-type: none"> <li>•absorbency</li> <li>•breathability</li> <li>•elasticity</li> <li>•softness</li> <li>•stretch</li> <li>•warmth</li> </ul>

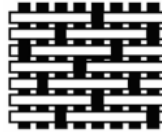
# Construction...Weaving



Basic make up of fabric

There are many different types of weaving. You must remember the construction of the weave gives the fabric a different appearance

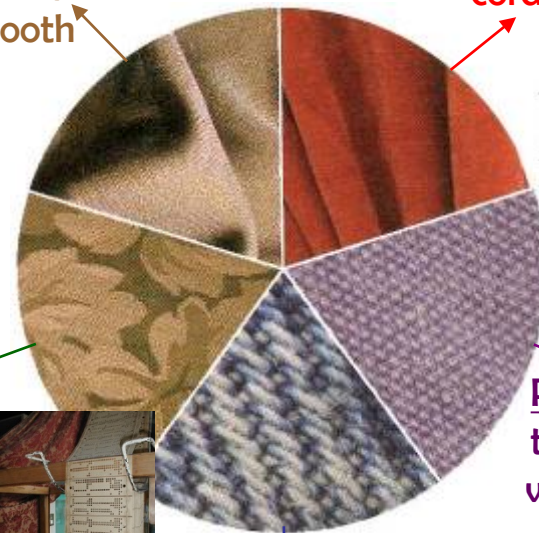
Satin Weave: Remember satin is a weave NOT a fibre. Weft yarns pass over & under 4 | 7 warp yarns giving it a smooth shiny surface.



Jacquard Weave: Made on a jacquard loom it is very complex. Fabrics are very expensive. The weave is produced using CAD CAM

Woven fabrics fray easily, strongest along the straight grain, little stretch, close weaves are stronger

Pile Weave: a woven fabric with a pile that can be made of loops (towelling) or thread (velvet / corduroy)



Plain Weave: This is the simplest weave, weft yarns pass over and under warp yarns. Eg: Cotton, polyester, calico

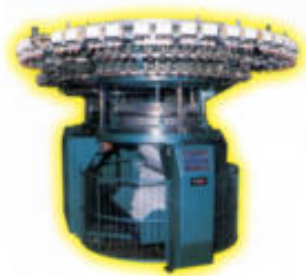
Twill Weave: Gives a diagonal pattern where the weft passes over & under either 2 or 4 warp. Eg: denim





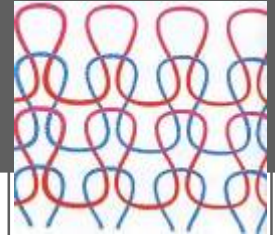
# Construction

## Knitted

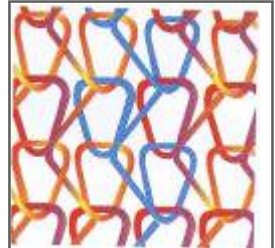


Circular knitting machine

There are two types of knitting, warp and weft. **Weft** knitting runs left to right and can be made using needles or a machine that creates the rows. **Warp** knitting runs up and down and can only be created on a machine, used for making net curtains and tights, can ladder (run up and down), they feel quite firm. Weft knits more stretchy than warp, warp, can be bulked up using finishes such as napping or brushing

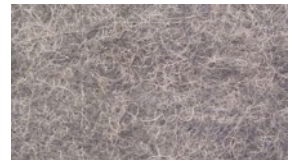


Weft knitting  
Left - right



Warp knitting  
Up & down

Non-woven fabrics are made with raw fibres which have been made into yarns first. They are treated with chemicals to matt them together or woven / knitted together before being felted using heat.



## Bonded

Bonded fibres are made by laying fibres across each other randomly or in a specific way. It can be bonded in many ways including: using adhesives to glue fibres, using solvent to soften fibres making them fuse, stitching to fix pieces

## Felted

Wool felts: Made by laying a web of fibres on a belt, treating it with solution then heating it. The web is passed through a range of rollers which matt the fibres together.  
Needle felts: Fibres are laid on top of each other and passed through many barbed needles. Fibres are pulled or dragged in many directions which interlocks the fibres

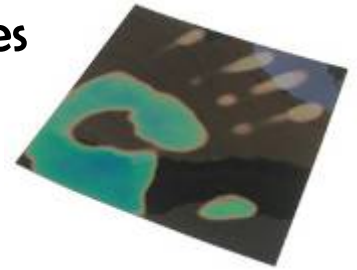
# Materials ... Smart/Modern

Smart textiles are fabrics that interact with you and your surroundings. This is called microenvironments. 'Smartness' can be added to natural fibres or microfibres using various technologies such as....

**Technology that emulates nature (biomimicry):** known as biometrics which opens and closes temperature like pinecones and fastskins...this helps swimmers glide through the water

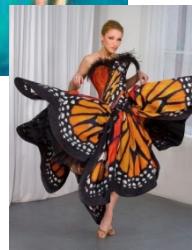


**Dye Technology:** Thermochromic or photochromic dyes change colour with heat or sunlight



**Printing Technology:** Conductive printing inks create electrically active patterns, circuits can be added onto fabric

**Reactive Technology:** chemicals or medicines added to fabric. These then react with your body – Micro-encapsulation



# Materials ... Finishes

## Physical

Brushing

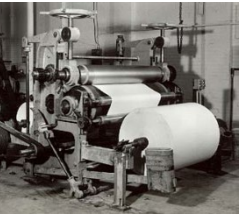
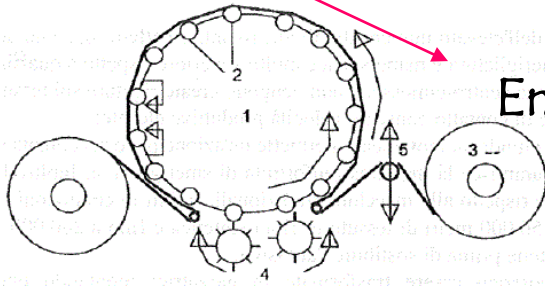
Fabrics passed between rollers which leave it soft and fluffy

Calendering

Fabric passed between heated rollers giving it a smooth finish

Embossing

Synthetic fabrics passed through pattern engraving heated rollers



## Chemical

Mercerising  
cotton

Fabric placed in sodium hydroxide making fibres swell. Cotton is more shiny, absorbent and stronger

Waterproofing  
All fabrics

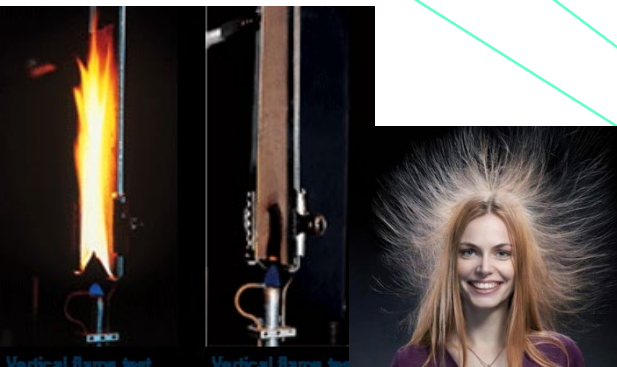
Chemicals (usually silicone based) sprayed on creating a protective barrier

Flame Proofing  
Cotton, linen

Chemicals applied to yarn / fabric. Slows down burning process

Anti-Static  
All fabrics

Chemical based product is applied which stops absorption of stains or dirt



# Dyeing & printing

Fabric can be dyed or printed at various stages of the manufacturing process:  
Yarn, Fabric, Cut fabric (printing), Fully fashioned garment

Before dyeing and printing the fabric is prepared by washing, bleaching and mercerising, in which the yarn is treated to improve strength, lustre and receptivity to dye. Fabrics can be dyed by hand or by machine.

## Hand Dyeing

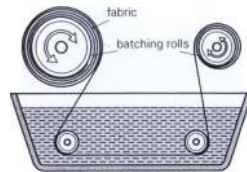
In hand dyeing, fabrics are immersed in hot or cold dyes in a dye bath. When the desired colour is achieved the fabric is removed and rinsed to remove excess dye. Then it is fixed with a mordant or a fixing agent such as salt. The strength of a dye colour is determined by the:

- amount of time in the dye bath
- absorbency of fibres
- original fabric colour
- concentration of the dye colour in the dye bath
- effective use of a mordant or fixative



## Commercial Dyeing

In industrial production fabric is dyed by continuous or batch dyeing.



### **Continuous dyeing**

The fabric is passed through a dye bath, and then squeezed between rollers to spread the dye evenly and remove excess. Continuous dyeing is used for colours that do not need to change too quickly with fashion.

### **Batch dyeing**

Fabrics are produced without dye. Instead, they are dyed to order in large batches according to the colours required. Batch dyeing is used for fabrics that have to change in colour frequently because of fashion.



# Dyeing, printing, decoration

Screen printing



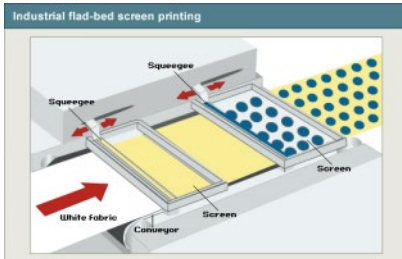
Block printing



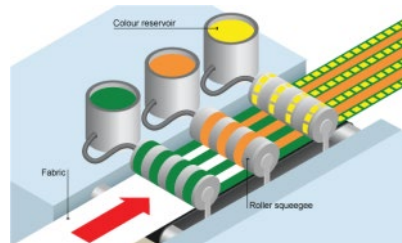
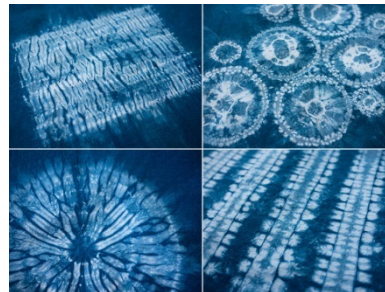
Batik (resist)



Sublimation printing



Tie & Dye (resist)



## Decoration:

- Applique
- Couching
- Embellishment
- Embroidery
- LED enhancement

# Components



**Integrated electronics**  
LEDs and other electronic components such as sensors are being integrated into textile and other products, and can offer a dual-purpose product like a wearable light-emitting garment or a roll-up illuminated mat.

And many more...



# E textiles

## What are e-textiles?

Electronic textiles (e-textiles) are innovative textile materials, (fabrics, yarns and threads), that incorporate conductive fibers or elements directly into the textile itself. These materials eliminate wires and hard electronics, so all you feel is the textile itself!

## How do e-textiles work?

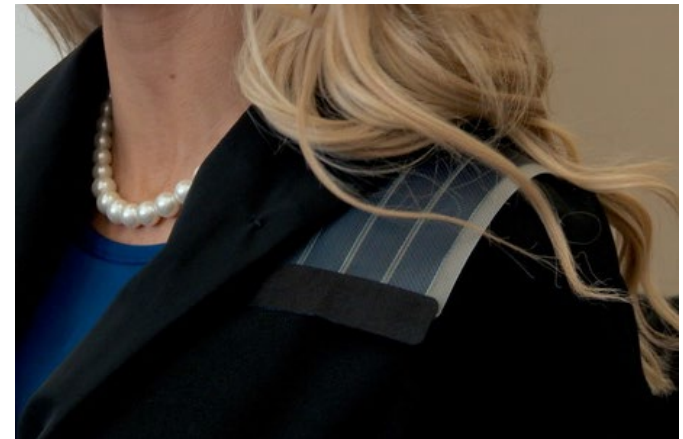
Electronic textiles incorporate conductive materials directly into the textile itself. There are many kinds of conductive textile materials available, from yarns to woven and coated fabrics.

## Where are e-textiles used?

Electronic textiles are used in many products, including the NuMetrex athletic garments that monitor your heart rate, fabric keypads for controlling your iPod, and heating products. They can be used to create sensors, thermochromic displays, data transfer systems, antenna and heating elements.

## How can I work/craft with e-textiles?

E -textiles today can be made with a variety of conductive materials including silver, stainless steel, copper, and organic conductors. Yarns are available in many structures and can be coated, twisted or spun. Other materials that come in handy are conductive tape and ink.



# Components – E Textiles

## Interesting links and video clips

<http://www.livescience.com/18238-smart-clothing-wearable-gadgets.html>

<https://www.drapersonline.com/news/drapers-advises-the-apprentice-contestants-on-wearable-tech/5065257.article>

<http://www.digitalspy.com/tv/the-apprentice/news/a603654/the-apprentice-candidates-design-wearable-technology-in-episode-2-preview/>





# CAD – CAM

## CAD



### Computer Aided Design

Patterns can be digitized using CAD, size can be altered and lay-plans created

Motifs are designed and coloured on the computer and enhanced with colour and text if required.

Patterns are laid on the plotter to be sure there is no wasted material when cut – lay plan

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## CAM



### Computer Aided Manufacture








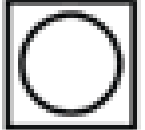
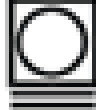

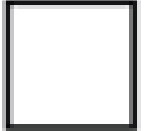

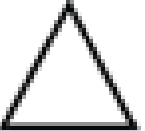

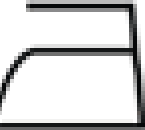









Used to mass produce embroidery: Many arms attached to a machine have numerous embroidery motifs being stitched at the same time.

Printing is done simultaneously.

Patterns are cut in bulk using laser cutters.



# Symbols ....care & clothing labels

 <b>MACHINE WASH</b>	 Cool/C	<div>  <p>www.smartcycle.com</p> </div> <div>    <p>line dry machine wash recycled polyester 100% post-consumer</p> </div>	RN 123456 97% Cotton 3% Spandex Made in Mexico of imported fabrics ( over for care) <b>Grande</b>	100% COTTON MADE IN PERU MACHINE WASH COLD INSIDE OUT GENTLE CYCLE WASH WITH LIKE COLORS DO NOT BLEACH TUMBLE DRY LOW COOL IRON DO NOT IRON PRINT & TRIMS VDR H06 109 RN 67835 CA 07415	<b>OTHER</b> Hand Wash 
 <b>TUMBLE DRY</b>	No H		Delicate 	<b>OTHER</b> Do Not Tumble Dry 	
 <b>DRY</b>	Line/H Dry				
 <b>BLEACH</b>	Any Bleach				
 <b>IRON</b>	Low				
<div>     </div>			Machine wash warm with like colors. Do not bleach. Tumble dry low.	Made in China    <b>SMALL</b>	
100% Polyester Hand wash cold. Do not bleach. Dry flat.			Machine wash warm with like colors. Do not bleach. Tumble dry low.	<b>DRY CLEAN</b> Do Not Dry Clean 	

# Symbols ....



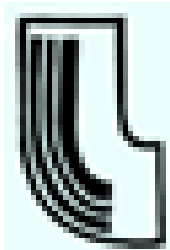
Cotton logo: NB: Organic cotton may be a little different but should say organic (staple fibre)



Wool logo (staple fibre)



Silk logo (filament fibre)



Linen logo: from the stem of the flax plant.  
Long staple fibre

# Symbols ....



Recyclable, or is made from recycled materials



British Standards (BS) Kite Mark: Ensures product meets certain safety and functional standards



CE mark – product meets **European Standards** for safety and quality



The **Lion Mark** – is a symbol of safety and quality, backed by a Code of Practice and developed by the British Toy & Hobby Association (BTHA) in 1988. It is used only by members of this association.



# Industrial processes

## Input

The starting point of the whole process. The input some from the client, designer, material and components to be used

## Process

Pattern layout, cutting, assembly of product, pressing, finishing, checking and packing...the whole making process

## Output

The final result. Eg: the finished garment in nice packaging...recycle where possible

One off, batch, mass

**Job Production:** Made by an individual or a small team from start to finish usually using traditional methods. Operators are highly skilled and versatile with equipment.

**Batch Production:** A reasonable number of products are produced, poss for seasonal demand. Machines & factory layout may need to be altered.

**Mass Production:** Designed for the manufacture of large number of identical products.

-Synchronised or straight line: Each operator does the same task repeatedly before passing work along production line.

-Repetitive flow: Manufacture is divided into sub-assembly lines that concentrate on one area of the process.

-Continual flow: used for massive volume items where the process runs 24hrs a day and is never shut down...mostly for simple items

## Just In Time (JIT)

Reduces costs. Assists with stock control called just in time. A business holds no stock and relies upon deliveries of raw materials and components to arrive JIT.

## Sub Assembly

Section of a product are made in a separate part of the factory or are outsourced. EG: collars, embellishment etc



Factories

# Hazards & safety

Safety is of utmost importance. A risk assessment is made which highlights all areas of potential risk.

Key risks include:

## Hazards

## Safety

### Sewing

Injuries to fingers when cleaning machines  
Eye injuries  
Finger injuries from needles

Switch machine off when cleaning  
Adjust eye guard  
Keep fingers away from needles during operation

### Cutting

Finger or hand injuries from cutting machines  
Finger or hand injuries from pressing mechanisms

Add safety guards  
Learn the correct way to handle the equipment



### Working area

Tripping or falling  
Electrical injury  
Incorrect handling of materials  
Incorrect lifting

Work area to be kept clean & tidy  
Never use a machine with damaged covers  
Don't carry too many things at once  
Learn the correct way to lift  
Cables suspended from the ceiling

### Chemical disposal

Safe use and disposal of dyes, finished and other chemical based solvents

**COSHH:** Control Of Substances Hazardous to Health

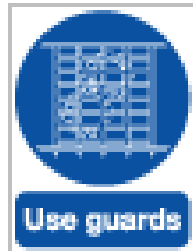
Wear protective clothing, dispose of safely

### Product

Once sold is the product safe to use  
Length, zip, electronics

Quality control checks throughout production  
Wear testing of the product

# Symbols ....in the workplace



100x25 S/A R276A-S  
200x150 Rigid M708-R  
S/A M708-S



200x150 Rigid RAC9C-R  
S/R RAC9C-S  
400x200 Rigid RAC9A-R  
S/R RAC9A-S  
600x450 Rigid MA208-R



200x150 Rigid M278-R  
S/R M278-S  
400x200 Rigid R27C-R  
S/R R27C-S  
600x450 Rigid R27A-R



400x300 Rigid R28B-R  
S/A R28B-S  
600x450 Rigid M28-R  
S/A M28-S



100x25 Rigid M28C-R  
S/A R28C-S  
200x150 Rigid R28A-R  
S/A R28A-S  
400x300 Rigid M28B-R  
S/A M28B-S



400x200 Rigid R273B-R  
S/A R273B-S  
600x450 Rigid M27A-R



200x150 Rigid R263A-R  
S/A R263A-S  
400x300 Rigid R27B-R



400x300 Rigid MA46A-R  
S/R MA46A-S  
600x450 Rigid MA46B-R



200x150 Rigid R23A-R  
S/R R23A-S  
400x300 Rigid M24B-R  
S/R M24B-S  
600x450 Rigid R24C-R



100x25 Rigid R28F-R  
S/R R28F-S  
200x150 Rigid M25A-R  
S/R M25A-S  
400x300 Rigid R25B-R  
S/R R25B-S



200x150 Rigid R226A-R  
S/A R226A-S  
400x300 Rigid M226B-R  
S/A M226B-S



200x150 Rigid F20A-R  
S/A F20A-S

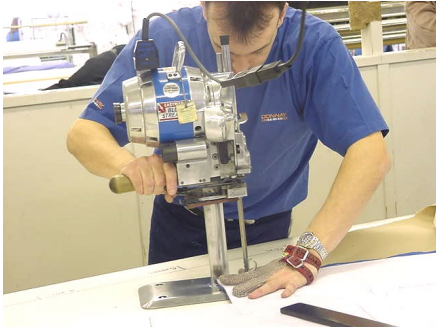


200x150 Rigid F24B-R  
S/A F24B-S



200x150 Rigid R271A-R  
S/A R271A-S

# Machinery ...in the workplace



Cutting



Binding



Cover seam



Lockstitch

Joining



Overlocker

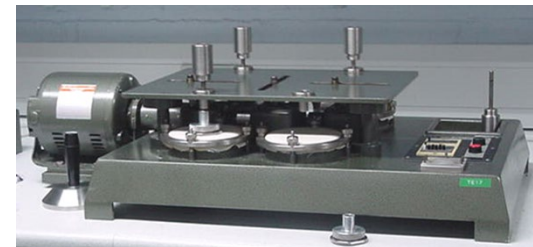
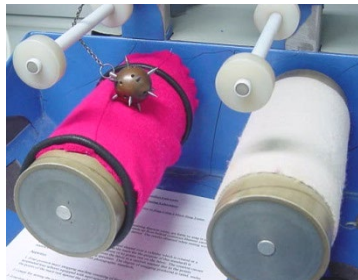


Eyelet machine



Buttonhole machine

Testing

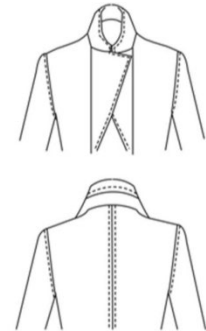
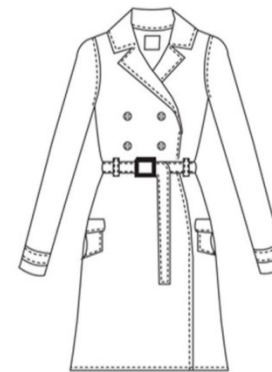




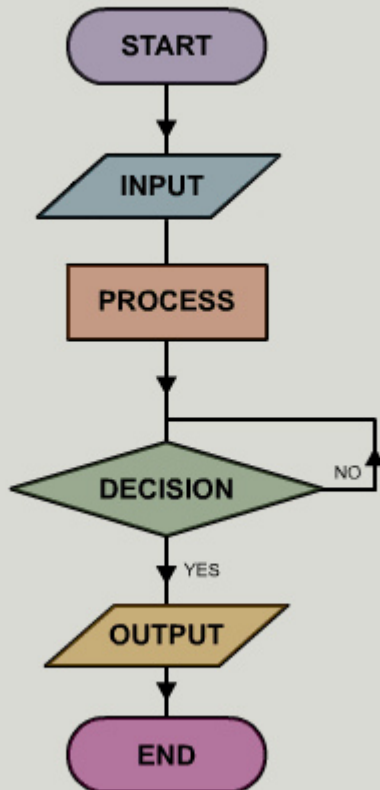
# Planning

It's likely you'll be asked to show some for of planning. Consider how you planned your production during coursework, your manufacturing spec...it's all part of planning:

THOMAS



## System flowchart symbols



All flowcharts begin with the **START** symbol. This shape is called a terminator.

**INPUTS**, such as materials or components, eg Printed Circuit Board (PCB)

**PROCESSES**, such as activities or tasks, are sometimes used to link to a subroutine (another flowchart) with more detailed steps, eg drill Printed Circuit Board(PCB)

The **DECISION** symbol checks a condition before carrying on, eg is the drilling accurate?

**OUTPUTS**, eg Printed Circuit Board(PCB) with holes drilled.

All flowcharts end with the **END** symbol. This shape is called a terminator.

## Manufacturing Specification

### Main stages of making: Flow Chart

Task 1:  
Task 2:  
Etc...

### Manufacturing Specification:

You will need to include:

- Lay plan of work on fabric
- Construction details
- Fabric & components
- Stitch details
- Care labels
- Packaging / marketing
- Deadline

Include as much relevant information as possible

**Fabric description**  
(incl. swatch)  
Stick all fabric swatches here with a brief description. E.g.: 100% cotton

**Stitch details:**  
Include a sample of each stitch required (even straight stitch) on the fabric you will use. Remember to write down if the length of width will change

**Components:**  
Photos or samples of each component:  
Zip  
Buttons  
Thread  
Sewing  
Etc

**Care label:**  
Washing instructions  
Iron temperature  
How to look after the product  
Etc

**Packaging information:**  
How will your product be packed?  
Will it require a brand label?  
Look at items you buy to see what extras are included

### Client:

### Product Description:

### Working Drawing:

Black & white line drawing of your product

Front & back view  
Stitch detail

### Lay plan:

Add a diagram or photo



### Costing:

See next page for information

Name :

Project Title :

**Manufacturing Specification**

TEXTILES TECHNOLOGY

Purpose of page:

16

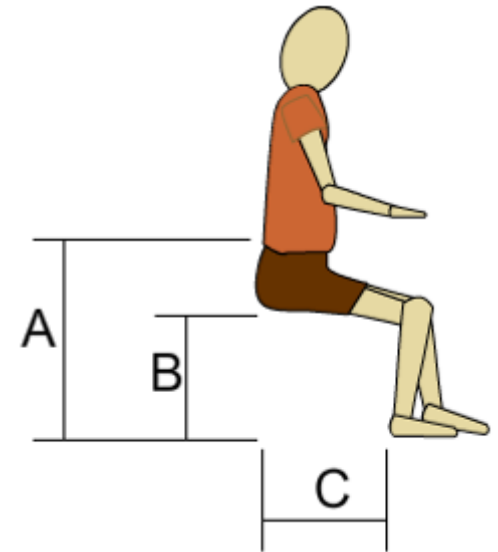


# Ergonomics....



Ergonomics is about designing for human needs. This chair isn't ergonomically designed as the user is too high off the floor and their back isn't supported, making it very uncomfortable

**ANTHROPOMETRIC DATA** is where designers use measurements which have been collected from hundreds of people so they know what sizes to make various parts of the product eg: the length of the dress



# Social, moral, environmental...

I won't bore you with this as we've done fairtrade report in yr10, environmental linked with cotton video, Katherine Hamnett (designer) etc...

**Social:** Protection from the elements: Designed to protect from sun, rain, wind etc. Modesty: Dependant on values of different societies. Most people cover up in public places although on the beach you would wear less. Muslim women may be covered from head to toe. Adornment: Used to decorate the body., show status etc.

**Moral:** There are growing concerns of how textiles are manufactured and how this can affect the lives and livelihood of those who make the products. After watching blood, sweat etc it has become obvious the little wage people are paid and the conditions they work in are very poor. Fair Trade has been set up to help these people. <https://www.youtube.com/watch?v=p11ocjeH1GA>

**Environmental:** Reduce, reuse, recycle: Many old garments can end up in landfill sights which takes years to biodegrade. You can help in 3 ways. **Reduce** the amount you buy. **Reuse** old garments by using them as cloths. **Recycle** garments by sending them to charity shops and recycling banks...these can be sent to poorer countries or broken down to the yarns.

# Quality ....

## QUALITY ASSURANCE

This means a guarantee of quality. Manufacturers assure that the product will be of a consistent quality.

It tests the systems before, during and after manufacture.

QA covers all of the different areas of work in the textiles industry including:

Training the workforce, advertising, customer service, health and safety, manufacture, sourcing materials, design, size, costing and much more.

## QUALITY CONTROL

This is part of the quality assurance process. It involves checking the product at 3 stages: design phase, manufacture and the end of manufacture.

QC will check size, colour, appearance, flammability and performance. Failure to meet standards may mean the product is unsafe or just not suitable to sell.

## TOLERANCE

Faults can be accepted or rejected depending if they fit into guidelines, these are called tolerances. For example, a seam could be + or – 3mm...this means that stitching within this amount is acceptable...outside of this is not.

# Quality ....

## QUALITY CONTROL cont'd

This is a series of checks to ensure that products:

- a) will be able to be made to a high standard
- b) are being made to a high standard



At the **start** of the process checks would be made to ensure that the materials which have been delivered is in fact the right size and type that was requested.

**During** the process, a random selection of garments would be checked to see that they are being made to the correct standard and sizes.

**At the end** of the process but before dispatch, products would be randomly checked to ensure that they are made to the exact specification and standard without marks or imperfections



# REMEMBER ....

- You MUST answer ALL questions. Have a go even if you're not sure.
- Underline or highlight key words
- 1 mark per minute...keep an eye on the time
- Read your answers fully
- Write in black pen / draw in pencil
- Take with you:
  - Pen, calculator, pencil, rubber, ruler, sharpener, water, confidence!

# GOOD LUCK!!!