

GCSE Textiles

REVISION

REMEMBER.....

- Read the question – what are you being asked?
- Look at the number of marks allocated, allow approximately 1 minute per mark
- Look at what the marks are being given for, eg 1 mark for an equipment list etc
- Try to use subject specific words where possible
- A SEAM is something you can SIT on, a HEM is something you can put your heel through!

REMEMBER.....

- **Design Specification:** Specifies what the design should be like, eg my dress must have short sleeves, the dress needs to be suitable for a teenager.
- **Fabric Specification:** Specifies what the fabric should be like, eg the fabric should be washable, the fabric needs to be stretchy.
- **Manufacturing Specification:** Specifies how the product should be manufactured (made) eg, a flow chart to show the order of making, details such as fabric type/colour.

FIBRES AND FABRICS

- **Natural fibres** – from plants (cotton, linen) and animals (wool, silk). They are biodegradeable (can be broken down by bacteria, biodegradable fabrics break down quickly in landfill sites). They are from a renewable source (sustainable)
- **Synthetic fibres** – Manmade – from coal/oil (polyester, acrylic and stretchy fibres eg lycra). They are NOT biodegradeable. They are made from NON renewable sources (not sustainable)
- **Regenerated** – mix of natural (wood pulp) and manmade (chemicals) Eg viscose. Partly biodegradeable. Partly renewable.

Natural fibres – Properties and uses

- Properties – what is the fabric like?
- From **plants** (cotton, linen). Are absorbent, hot washable, crease easily, comfortable to wear, breathable. Used for fashion clothing, sports wear, towels.
- From **animals** (wool, silk). Very absorbent, warm, NOT EASY CARE (wool shrinks, silk gets brittle when washed), durable, can be itchy. Used for clothing, jumpers, coats, scarf.

Synthetic (manmade) and **Regenerated** fibres – Properties and Uses

- **Synthetic** (manmade) – Non absorbent, durable, easy care, doesn't crease, can be 'heat set' eg pleated skirt. Used for fashion clothing, sportswear, (lycra and nylon make swimsuit material)
- **Regenerated** (Mix of natural and chemicals) – creases easily, hot washable, soft, drapes well, comfortable, cool to wear (fashion products, fine knitwear)

YARNS

- All yarns are made from fibres. These are either STAPLE (Short fibres) or FILAMENT (Long, endless fibres)
- STAPLE (short) – all NATURAL fibres EXCEPT silk (BUT synthetic fibres can be cut into staple fibres)
- FILAMENT – (long) all SYNTHETIC (manmade) fibres and Silk (synthetic fabrics tend to be shiny due to being made from long filament fibres that reflect the light better than short fibres)

ALSO: Synthetic (manmade) fibres, eg acrylic, polyester, nylon are thermoplastic and can be heat set into different shapes, eg pleated skirt.

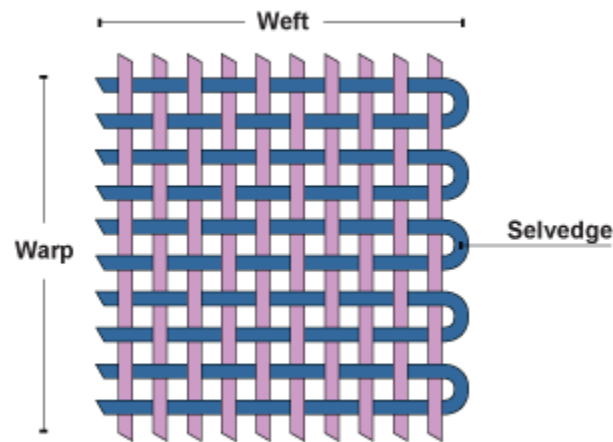
Blended Yarns and Mixed Fabrics

- Fibres are often mixed together to improve their PROPERTIES and to make them cheaper. When fibres are mixed in a yarn it is called BLENDING. For example, POLYESTER and COTTON (POLYCOTTON) in school shirts. POLYESTER = easy care, doesn't crease. COTTON = breathable and comfortable.
- When 2 or more different yarns are put on a loom to make a fabric it is called MIXING eg Dupion silk (warp is a fine silk or viscose, weft is thicker)

Most fabrics are made by Weaving or Knitting

WEAVING

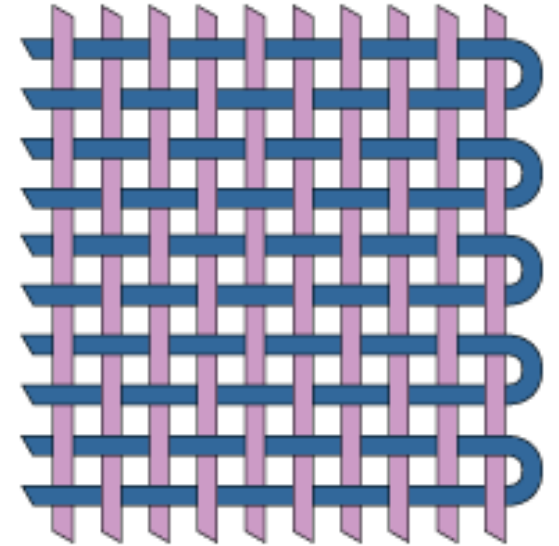
- All woven fabrics are made on a loom
- They have a WARP and a WEFT
- The woven fabric edge is called a SELVEDGE (self edge)



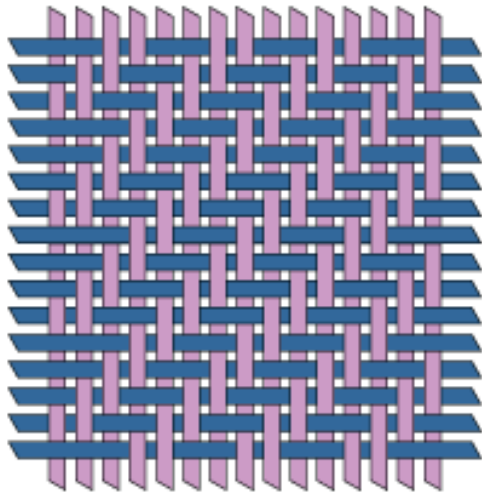
There are 3 main types of WEAVE

- Plain weave – a stable cloth, cheap, good for printing eg calico, organza
The warp and weft form a simple criss cross pattern.

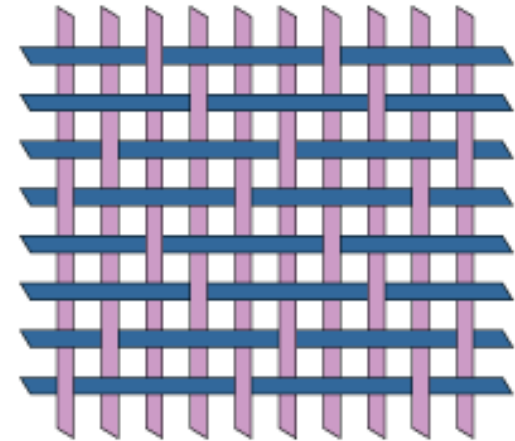
Plain weave is also the basis of PILE weaves which
Have an extra loose weft which forms loops
(towelling) or can be cut (velvet or corduroy)



- **TWILL** weave – warp and weft are offset to give a diagonal pattern. This is the strongest weave, is durable, drapes well, textured. Good example is Denim.

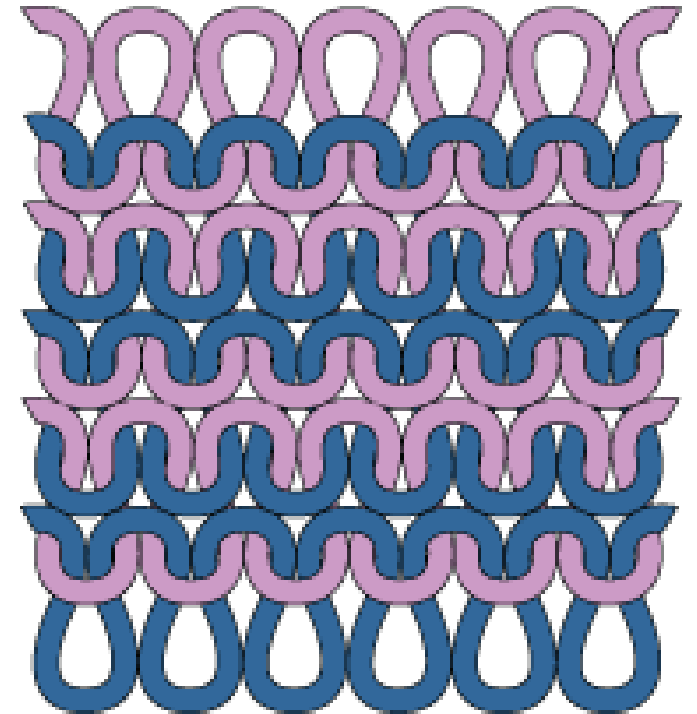


- **SATIN** weave – (weft goes under 4 warp, over 1. The warp ‘floats’ making it appear shiny. Weakest weave, shiny, drapes well, good for lining, lingerie eg Silk satin, polyester satin.



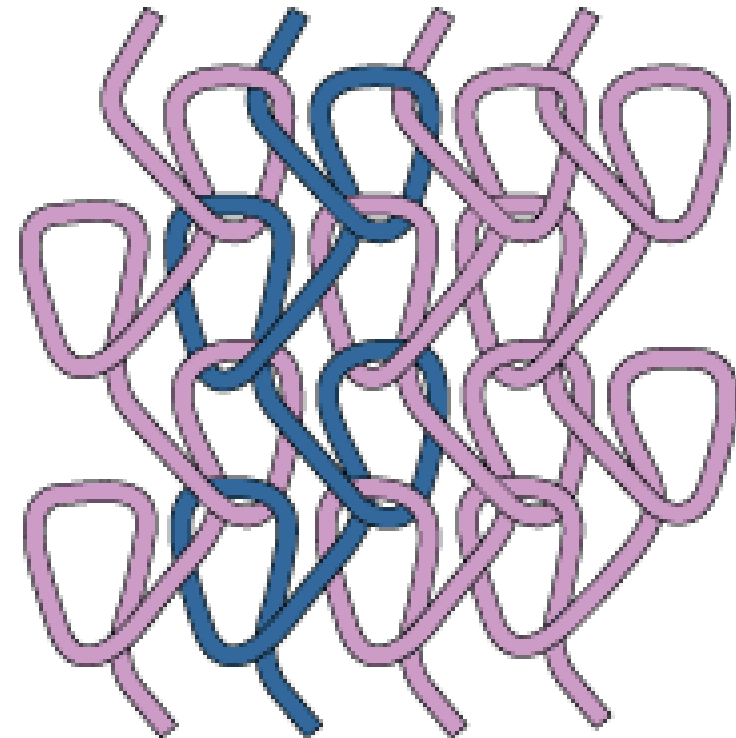
KNITTED FABRICS

- Knitted fabrics are stretchy. There are 2 types of knit:
- **Weft Knit** – made by looping together long lengths of yarn.
- Made by hand or machine
- Yarn runs in rows across the fabric.
- If a stitch is ‘dropped’, knitting will ‘ladder’ along the length of the fabric
- Fabric is stretchy, comfortable. Used for socks, t shirts, jumpers.



KNITTED FABRIC – Warp knit

- Loops interlock **vertically** along length of fabric.
- Fabrics are slightly stretchy
- Fabrics do not ladder
- Warp knitted fabric is made by machine
- Used for swimwear, underwear



NON Woven fabrics

- Non woven fabrics are neither woven or knitted
- They are made from 'webs' of fibres that are bonded together
- Examples are **FELT** (made by 'felting' the fibres together) and **INTERFACING** (fibres are bonded together)
- Interfacing is used for lining or strengthening fabrics and can be sewn in or ironed on (fusible)
- These fabrics are not very strong. They are easy to sew, do not crease, do not fray.

Fabric FINISHES

- A finish can be applied to a fabric to **ENHANCE** it's qualities. These can be
- Physical, eg brushing, embossing, stonewashing
- Chemical, eg waterproofing, flame retardant, stain resistant
- Biological, eg enzyme treatment
- Smart, eg microencapsulation reacting to heat (thermochromic), light (photochromic) and pressure.

SMART and MODERN fabrics

- **Smart fabrics adjust themselves to changes in the environment**, eg
- **Thermochromic** (reacts to heat) eg baby clothing, medical textiles
- **Photochromic** (reacts to light) eg t shirts, military clothing
- **Pressure** eg scratch and sniff toys

(All of these are either sprayed on as a finish, or added as a smart pigment to fabric paint or dye.)

- **Micro encapsulated** – nano sized particles added to fibres or fabrics, activated when fabric is rubbed against body which breaks capsules releasing contents, eg moisturising tights.

Modern fabrics

- **Biomimetic** – mimics nature. Eg fastskin (mimics sharkskin and helps the swimmer to go faster)
- **Kevlar** (bullet proof) used for bullet proof vests
- **Gore-tex** (rain and waterproof) Gore-tex has 3 layers: lining, Teflon membrane and outer shell. Gaps are so small they let water vapour out (sweat) but rain drops are too large to get in making the garment waterproof.
- **Micro fibres**- 100x finer than human hair. Used for sportswear
- **Nano technology** – allows new materials to be made by changing individual molecules. Properties of a fabric can be changed, eg cotton fibres can be made water and stain repellent.

Electronics in Textiles

- **Wearable electronics** – clothing that can contain micro-electronic sensors which can be used to monitor, gather and transmit information on the wearer's health or physical state.
- Eg heart rate monitor in sports clothing
- Also enables Phone/MP3/SAT NAV to be incorporated and activated within the garment.

PRODUCTION OF TEXTILE ITEMS

- There are 3 types of production:
- **One Off Production** – individually made items. Advantage: able to create an individual item. Disadvantage: expensive, takes a long time.
- **Batch Production** – a specific number of identical items are made. Advantage: batch can be repeated as many times as necessary. Disadvantage: Machinists may take a while to learn how to make each new design.
- **Mass Production** – A large number of identical products, made for a long period of time. Advantage: Cheaper to make. Disadvantage: Expensive to set up initial machinery needed.

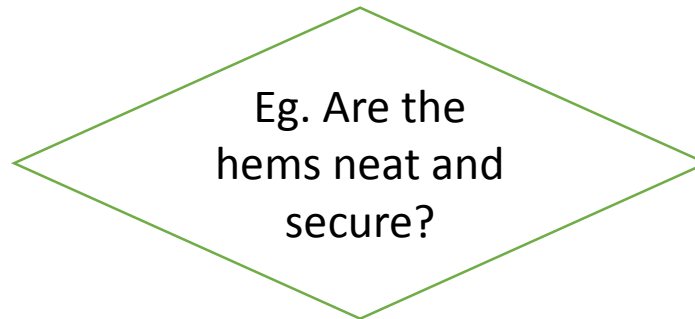
JUST IN TIME (JIT) and SUB-ASSEMBLY

- **Just in Time (JIT)** is used when materials arrive at the factory 'just in time'
- Advantages: Cheaper as saves storage space, factory only orders what it needs, doesn't have money 'tied up' in stock.
- Disadvantages: May have delays in deliveries, materials may come in damaged/incorrect, thus holding up production.
- **SUB-ASSEMBLY** – A separate line of manufacture which runs at the same time as the main production line, and eventually feeds into it. Means specialist machinery/machinists can be used for certain stages, fewer faults.

FLOW CHARTS

- Flow charts are used in manufacturing to:
- Make sure the order (or 'flow') of making is efficient and correct
- Allows them to monitor the quality of each item, making sure each item is identical
- All of this helps a company to meet production deadlines
- Special shapes are used for each part of a FLOW CHART:

Each **PROCESS** goes into a box
this shape.
eg. Stitch the side seams



Diamond shapes are for
QUALITY CONTROL
checks, these are done at
various stages of
production.

CAD – Computer Aided Design

CAM – Computer Aided Manufacture

- **CAD – Designing products on a computer. Includes 2D painting software, 2D drawing software, 3D modelling software. Use CAD to:**
- Produce moodboards
- draw final design ideas
- try changing colourways/prints on your product
- email ideas to your client
- model your final design in 3D
- create an economical layplan for your pattern pieces
- make changes to your patterns.

CAM – Computer Aided Manufacture

- **CAM - Using computers to help manufacture products.**
- CAM is usually linked to CAD, eg an embroidery design could be designed on computer (CAD) then produced on a CAM embroidery machine.
- CAM machines include: Cutting machines, Sewing machines, Embroidery and knitting machines, Fabric printing.
- Advantage: different designs quickly and cheaply modelled, changes made quickly. Production speeded up, more accurate, safer for workers.
- Disadvantage: Initial cost of software and hardware is high. Workers need training which can be expensive. Power cuts, computer viruses.

Health and Safety

- Health and Safety is there to keep workers safe.
- It is the **EMPLOYERS** responsibility to ensure the health and safety of their workforce.
- Workers should be trained to use equipment correctly and safely.
- **Risk assessments** should be carried out by employers to ensure workers are able to work safely. This points out what must be done for a work area to be safe for employees.
- **Safety signs** should be placed near dangerous equipment
- Examples of safe working: Sewing machine guards, Dust extractors, Emergency stop buttons, Protective clothing, Safe use of chemicals

Quality Control and Quality Assurance

- **Quality Control** checks are made at various points during manufacturing. This could be:
- Checking the quantity, quality, colour of materials when they arrive at the factory
- Making checks during the production process, has the right seam allowance been used? Are the correct components used? Are they correctly and securely attached?
- The final product is checked at the end before packing.
- During your project you created a FLOW CHART which showed where quality checks were made when making your final piece (diamond shape)

Quality Assurance

- **Quality Assurance** is a system that is set up to make sure a product meets all the criteria on the design and product specification.
- The customer is **assured** that the product is of the same quality every time it is made.
- An important part of Quality Assurance is Quality control checks at critical points during manufacture.
- Benefits to manufacturer: less wastage of materials, less time wasted because workers have to repeat less work. Fewer products are returned for refunds/exchange by customers. Better reputation.

TESTING FABRICS

- Fabrics can be tested to see if they are suitable for the intended use. Testing can include:
 - **Waterproof** – droplets of water poured on to see if it ‘runs off’
 - **Flameproof** – how easily does the fabric catch light?
 - **Rub test** – how easily does the fabric wear out. This can be done using a simple sandpaper block for a set number of ‘rubs’
 - **Crease testing** – how easily does the fabric crease?
 - **Stretch** – how much does the fabric stretch? Does it go back to it’s original size quickly?

Consumer Rights

- A consumer has a right to buy a product that is **high quality** and is **safe**.
- In the UK, laws make sure consumers are sold **quality** products, including:
- **The Trade Descriptions Act** – any claim that a manufacturer makes about their product must be true.
- **Sale of Goods Act** – protects consumers when they buy good.
- **General product safety regulations** – Manufacturers are responsible for the safety of their products.

Product Labelling

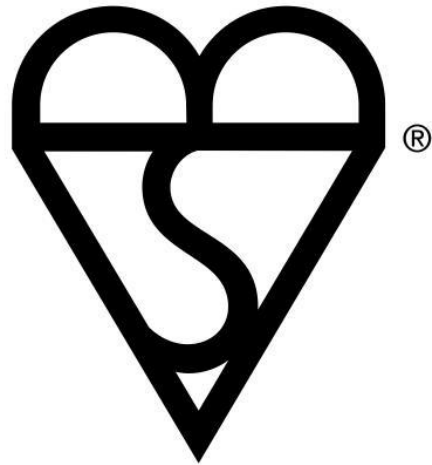


Lion Mark – for children's toys.
Shows the toy has been made to strict safety, marketing and ethical guidelines.



CE Mark – Product meets essential safety standards that allow it to be sold in Europe.

Product Labelling



British Standards Kite
Mark



Fair Trade Logo



European Eco logo – a
product has reduced
environmental impact

Care Labelling

- All textiles products must be clearly labelled with the correct aftercare processes. This is usually displayed on a care label which should include the following information:
- **Country of origin** (where the product has been made)
- **Fibre content** (eg 65% polyester 35% cotton)
- **Product details**, eg size, style
- **How to care for the product** (washing instructions)
- **Retailers logo**
- **Bar code**

Care label symbols



- Washing symbol will usually give an indication of temperature (or hand wash)
- Tumble Dry symbol and Iron symbol will have 1 to 3 dots – the more dots, the higher the temperature.
- Dry cleaning may have a letter (usually 'P') This is so the dry cleaner's know which chemical to use.
- A **X** through any symbol means DO NOT.

Textiles and the Environment

6 R's of Sustainability

- **RE-USE** – re-use clothing/components rather than throwing away
- **REDUCE** – reduce the amount of materials we use, reduce waste
- **RECYCLE** – recycle unwanted goods, recycle rubbish
- **RE-THINK** – rethink a design – how could it be more sustainable
- **REFUSE** – refuse to buy products that harm the environment
- **REPAIR** – repair broken products rather than throwing away.

Textiles and the Environment

- Sustainability: this is when the environment is not harmed through manufacture of products.
- Sustainable resources – can be replaced at the same rate they are used up.
- Environmental aspects – use of pesticides when growing cotton crops. Causes cancer and other diseases, land is made infertile, excessive use of water.
- Transport and packaging use up energy and resources
- Dyeing fabric uses lots of water and chemicals run into drinking water.

Textiles and the Environment - ORGANIC

- Organic means no **artificial pesticides** or **fertilisers** were used at all to grow the product.
- Ground has to be pesticide free for 3 years before it can be called organic.
- Instead, farmers use **natural fertilisers**, eg manure, or **natural pesticides** such as natural oils. These keep pests away without harming other creatures.
- Farming **ORGANICALLY** is better for the health of workers, they are not exposed to toxic chemicals. Also better for the environment – it doesn't harm wildlife or the ecosystem.

Textiles and the Environment – Fair Trade

Fair Trade means:

- Workers are paid a living wage
 - Have a regulated work day
 - Have safe working conditions.
 - Farmers are paid a fair price eg Fair Trade cotton
-
- Fair Trade projects help whole communities in the Third World. Schools and hospitals are built from the profits.