

## Dyeing, printing and fabric enhancement

### Further ways to add colour and decoration to fabric

You have looked at methods of dyeing, printing and fabric enhancement (also known as embellishment). This worksheet will examine some further methods. It will also test your ability to explain different decorative techniques to enhance the aesthetics and appearance of textile products.

#### Flock printing

This printing method is where adhesive (rather than pigment) is printed onto the fabric. Short fibres are either contained within the adhesive, or are dusted onto it. The fibres can also be electro statically applied so that they remain upright. The stuck fibres create a slight pile or raised texture to the fabric.

This technique is used mainly for details such as dots and figures, and is often printed onto lightweight or sheer fabrics.

#### Devore

Devore comes from the French word 'devorer', meaning to devour. It is aptly named, because the pastes used burn away, or devour, fibres, leaving the base fibre.

You can create devore by printing a burnout (devorant) paste onto a mixed fibre fabric. The burnout paste destroys (burns out) viscose and plant (cellulose) fibres such as cotton and linen, and leaves other fibres, such as polyester, and animal fibres like silk and wool, intact.

Devore is commonly used for its effective aesthetic qualities on velvet fabric, where the viscose pile is eaten away and the silk backing remains in place to give a luxurious, semi-translucent or lace effect. The drawback to this method is that the backing fibre is weak and can cause fraying. This is why it is not suitable for clothing and is used mainly for luxurious scarves and wraps/shawls.

This technique can be applied by hand, but in industrial production the burnout paste is printed on and left to develop or burn out the fibres before being washed away to reveal the design.



#### Task 1

Suggest the method of printing that has been used in the image. List the advantages of using this method and why it is suitable for this product.

### Dimensional fabric paints

Dimensional fabric paints have become a very popular way of adding decorative texture and interesting detail quickly to a fabric. There are many different types of these paints, including ones that puff up, glitter or glow in the dark.

This technique is applied by hand, but in industry the effects are created through printing techniques, rather than by hand. The drawback to these techniques is that they deteriorate after washing.

#### Shisha work

This is an Indian technique where small mirrors (these can be different shapes, but are mainly round) are applied to fabrics by hand stitching. The products using this method can be washed, but only by hand due to the fragility of the mirrors. They are mainly used on Indian textiles, including clothes, bags and cushions.

#### Task 2

Study the image below and label all the decorative techniques you can see.

Remember to consider whether the base fabric has been dyed or printed. Note how these techniques have enhanced the product.



#### Task 3

Select one of the dyeing, printing or fabric enhancing techniques you have learnt about, either from this worksheet or what you have learnt. On a separate piece of paper, produce a flow chart for this method.

#### Tip

It is worth learning to record dyeing, printing and fabric enhancing methods in a flow chart format or by labelled diagrams, as you could be asked to complete these in your exam.

## **Environmental issues and sustainability**

Green and ethical issues have become more and more important to consumers. Consumers now understand more about the impact the products they buy have on the environment and the people employed to manufacture them. This worksheet helps you to gain knowledge on such issues including 'sustainability' and 'ethical fabric production'.

### **Question 1**

What is meant by the term 'sustainability'?

### **Question 2**

List five things that a sustainable product design will include.

### **Question 3**

How is labelling used to promote sustainability?

### **Question 4**

Find an example of such labelling and draw it here:

### **Question 5**

What is renewable energy?

### **Question 6**

Using the example of Levi's Red Tab eco jeans, suggest why a customer might buy these over an ordinary pair of Levi jeans.

### **Question 7**

Why is growing cotton a concern for the environment?

### **Question 8**

Why is growing organic cotton better for the environment?

### **Question 9**

What is Tencel®?

### **Question 10**

Why is choosing to use Tencel® better for the environment?

### **Question 11**

Why might using Tencel® not be a benefit to the environment?

### **Question 12**

Why is organic cotton a popular choice for babies' clothes?

## **Fabric construction**

You learnt about the fabric construction of woven, non-woven and knitted fabrics. This worksheet will give further product examples for each construction technique, along with questions to test your knowledge of each application.

## Woven fabrics



This pair of jeans is made from denim fabric. Denim is only ever made from the twill weave, and is easily identifiable by the diagonal stripe on the fabric.

### Task 4

From your understanding of a twill weave, answer the following questions.  
Why is this type of construction used for this product?  
Could another type of construction be used? Give your reasons why.

## Non-woven fabrics



These Christmas tree decorations are made from felt. Felt is a non-woven fabric and is often used for craft items.

### Task 5

From your understanding of felt, answer the following questions.  
Why are craft products often made using this non-woven fabric?

Name a product that felt would not be suitable for. Give your reasons why.

## Knitted fabrics



This woman is wearing three knitted, woollen garments.

### Task 3

From your understanding of knitted fabrics, answer the following questions.  
Why is a knitted, woollen construction suitable for the three garments that the woman is wearing? Give your reasons below. Hat:

Scarf:

Jumper:

Give a disadvantage for using a woollen, knitted construction for these garments.

## Task 6

State why each product pictured below has used the given construction technique.

Satin woven dress:

Jersey Knit T-shirt

Non-woven dish cloth



## Further investigation of natural fibres

Having looked at most of the more common natural fibres, this worksheet will encourage you to investigate the wide array of natural fibres that are available. Two are detailed below.

### Jute

Jute is a plant-based fibre taken from the bark of the jute plant, and is mainly grown in South Asia. Jute was originally used for ropes and in the rigging of ships and boats. Modern technologies have meant that it now has a much wider use, as it can be spun into better quality yarn and woven to make jute cloth.

## Llama

Llama fibre is an animal-based fibre. The llama lives high up in the mountains of the South American Andes, along with three other camelids: the alpaca, the vicuna, and the guanaco. Llamas have a coat that needs to be shorn in order for it to grow. Shearing is done annually and provides a hollow fibre that is soft, very light, strong and insulating. This fibre is made into knitwear and textile fabrics, and is especially favoured as a material for suits. Llama fibres also contain a thicker protective hair that can be separated and used for making blankets, rugs and ropes.

### Task 7

Give four other examples of natural fibres. State whether they are plant or animal based.

### Task 8

For each example you have given, complete this properties table for natural fibres.

You have been given an example to help you.

Fibre name	Linen flax		
Physical	Very hard-wearing, cool next to skin, strong, absorbent and creases easily, has no drape		
Fabric Names	Duck / Huckabuck		
Uses	Lightweight clothing, often for summer wear Soft furnishings, tea towels and table linen		
Advantages	Stronger when wet / Smooth finish Very hard-wearing / Highly absorbent Comfortable fabric to wear		

## Linen – from source to fabric

Linen plants (also known as flax) grow mainly in China, Russia, France and the Ukraine, where the climate is cool but damp. They are processed in the following way:

### Pulling

Plants – including the root to ensure a log stem – are harvested either by hand or machine.

### Roughing out

This is the process that removes the leaves, flowers and seeds from the plant.

### Retting

To remove the fibres, the plant stems must be soaked in warm water for between five to eight days. This process rots the outer stem, revealing the flax fibres.

### Scutching and breaking

Machines with large rollers, which are fluted around the edge, crush and break the fibres so that they separate from the now-rotted woody outer stem.

### Hackling

The fibres are machine-combed to create long line fibres known as line flax. The other short fibres that are combed out are called hackle tow.

### Processing

Line flax is spun into yarns. This is known as wet spinning, or the linen process. The yarn is fine and is used mainly for clothing fabrics or high-quality domestic textiles. The hackle tow is spun using a dry spinning method and is a heavier yarn. This is used mainly for furnishing fabrics, wall-coverings, canvases and tea towels. Both yarns are known as grey yarn until they are bleached or boiled white, after which they are suitable for taking on colours through dyeing.

### Task 9

Using the example above to help you, record how cotton fibre is taken from source to fabric. Please continue on a separate piece of paper if necessary.

## Recycling textiles

### Examples of recycling

To minimise the impact textile production has on the environment designers can look to source fabrics from textile waste, pre-used textiles or recycled products such as PET bottles. Recycling and reusing was commonplace in the past due to needing to be resourceful with very few accessible materials and lack of disposable income to spend on luxury items such as fashion. As we find ourselves in an unpredictable economy, the need to recycle and reuse takes on a new significance.

This worksheet attempts to look at some of the products inspired and produced using such methods.

You should use the Nelson Thornes student book and the internet to help you answer the following questions.

**Question 1**

There has been a current interest in reusing clothing known as 'Vintage'. What does 'vintage' mean? And how does this contribute to minimising the impact of textile production on the environment?

**Hat using remnants of waste fabric**



**Question 2**

Looking at the images below and state the technique used in each that makes good use of waste clothing fabrics. How does using this technique contribute to minimising the impact of textile production on the environment?

Hat using remnants of waste fabric



Cushion using waste fabrics left over from making garments



**Question 3**

Looking at the image, suggest why antique sari fabrics have been used and how recycling might support both the environment and the culture from which it is produced.

Door hanging using Antique Sari Fabrics

**Question 4**

Using the internet, find images of products that include recycled fabrics and components. Print out and display your images.

**Health and safety: risk assessment**

**Linking hazards with safety precautions**

In the workplace it is important to identify potential hazards in order for the correct procedure or precaution be put in place to avoid accidents and injuries.

This worksheet attempts to look at some of the hazards within the textile industry and how they can be minimised or avoided.

You should the internet to help you answer the following:

- 1 Complete the table, giving the correct safety precaution to the featured hazard. A list of precautions has been provided to help you.

***List of precautions that could be taken to prevent the given hazards***

- Ventilation in place to remove solvent vapours.
- Platforms or walkways to be available on wide rotary or flat printing machines.
- During screen preparation, where lasers, ultraviolet or other special light sources are used, systems should be in use to prevent access whilst operations are taking place.
- Pits and gullies to be guarded, fenced and clearly marked.
- Valves and other controls to be located in a safe position on open vessels (therefore no risks from overflowing or boiling liquor). Hot parts to be guarded or lagged.
- Buckets with lids to be used to prevent spillages.
- Containers to be labelled with warnings. No source of ignition.
- All sharp blades, scissors and sharp implements (needles and pins) to be stored safely. Finger guards to be used.
- Use a press that needs to be controlled by both hands, one person per machine. Ventilation in place to remove vapours.
- Finger guards and eye shields/goggles to be used. Long hair to be tied up and no loose clothing. Seats adjusted to correct posture.
- Hard hats to be worn. Danger areas to be marked with black and yellow warning strips to show designated walkways. Safety guards and protective clothing, gloves and footwear to be worn.
- Use a steam room rather than steaming individual garments. Ventilation in place to remove vapours.
- Use finger guards, protective chain mail gloves and steel toe-cap footwear.
- Ventilation in place to remove vapours from heat sealers. Safety guards and protective clothing, gloves and footwear to be worn.
- Correct handling, lifting and fork-lift truck training to be given to staff.

Manufacturing stage	Hazard	Safety precaution
Sewing	<p>Finger and hand injuries from needles and blades, eye injuries from broken needles, pulled hair from thread or fabric feed.</p> <p>High noise level may damage hearing.</p> <p>Seating may cause back injuries.</p>	
Scissors, blades and needles	Cuts and pricks to fingers.	
Pressing and steaming	<p>Burns and scalds to fingers and hands from hot plates and steam.</p> <p>Inhalation of vapours.</p>	
Cleaning and stain removal	<p>Inhalation of solvent vapours, skin damage or reaction to contact with solvents.</p> <p>Fire hazard.</p> <p>Toxic chemicals.</p>	
Production line handling	<p>Head injury from overhead transport system.</p> <p>Trapped fingers and feet from moving conveyors, trolleys and vehicles.</p> <p>Tripping over stacked materials.</p>	
Packaging	<p>Finger and hand injuries from cutting, folding and heat sealing during packaging.</p> <p>Inhalation of heat-sealing vapours.</p>	
Delivery (lifting and loading)	Back and neck injuries where manual lifting is required.	