

## Unit 8A(iii) Exploring materials

### Focus: textiles

#### About the unit

The main aim of this unit is for pupils to explore the properties of materials when designing, so that they will be able to identify appropriate materials for a task.

In this unit, pupils tackle a design and make assignment (DMA) on the theme ‘Finding an identity – decorative techniques on textiles’.

They have to design and print or dye a piece of fabric to make into a product that an environmental group could sell to its members. They identify suitable materials and techniques, taking into account appearance, function, safety and reliability.

Pupils gain the knowledge, skills and understanding they need to carry out the DMA successfully through product evaluation activities and focused practical tasks. They:

- find out about the processing of raw materials and potential end uses, *eg fibre to yarn to fabric, bonded fibre to non-woven fabric*
- recognise the connection between the properties of fibres, their performance and how they are used, *eg cotton is cool to wear which makes it ideal for knitted T-shirts*
- learn how the properties and working characteristics of textile materials, *eg elasticity, drape, absorbency*, relate to their composition, construction and finishing, and how synthetic fibres can be made to emulate natural fibres, *eg microfibres are engineered to give a wide range of properties and end uses*
- identify methods for reinforcing and strengthening textiles, *eg through the use of layering, combining, interlining*

#### Where the unit fits in

This is one of three textiles units that focus on understanding materials: one in year 7 on using and understanding materials; this one in year 8 on exploring materials in greater depth; and one in year 9 on critically selecting materials. These units ensure progression in understanding about materials.

This is part of a series of three units in year 8 on exploring materials; there are equivalent units, with similar learning outcomes, on food and resistant materials. Together these units are expected to take 15–22 hours. It is important that the department plans as a team so that pupils are able to draw on knowledge, skills and understanding from across the units to reinforce their learning and avoid unnecessary repetition.

If you choose not to teach this unit, then plan to include the essential activities identified by the symbol ■ as part of another unit.

#### Expectations

##### At the end of this unit

**most pupils will:** select materials for particular purposes, considering their working properties and performance characteristics, the available tools and equipment, and the form, size and performance specifications of the material available; process materials to change their working properties and performance in use, if appropriate, using techniques to alter materials on a temporary basis, to make them easier to work with; apply their understanding of the properties of materials and how these can be managed and exploited; select finishing techniques for materials that are appropriate to their end use, with the aim of enhancing their appearance and maintaining their performance in use

**some pupils will not have made so much progress and will:** choose appropriate materials from those available, drawing on their previous experience of working with them, and explain their reasons for using particular materials; cut, shape and form materials, working with a range of tools and equipment; use finishing techniques that are suitable for the product’s end use

**some pupils will have progressed further and will:** draw on their knowledge of materials and production processes, recognising the advantages and disadvantages of particular tools and equipment and processes; make decisions which resolve conflicting demands, *eg balancing cost and aesthetic appeal against function and performance*; evaluate how effectively they have used information on the properties of materials when testing their product

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## Prior learning

It is helpful if pupils have:

- learnt that many different materials can be used on a product, *eg in a slipper*, some to stiffen, some to provide a hard-wearing surface and some for appearance
- classified materials by fibre sources, *eg natural, synthetic*, and by fabric construction, *eg woven, non-woven, knitted*
- investigated different cultural contexts in which textiles have been developed and used
- investigated and developed skills in modifying the appearance of textiles, *eg colouring or decorative techniques*
- considered the aesthetic and functional properties of materials, *eg water resistance, drape, comfort, absorbency, flexibility*

Pupils should have gained the above knowledge, skills and understanding in years 6 and 7, through unit 6B ‘Slippers’ in the key stage 2 scheme of work and unit 7A(iii) ‘Understanding materials (textiles)’, or similar projects.

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## Language for learning

Through the activities in this unit, pupils will be able to understand, use and spell correctly words relating to:

- the properties of materials and their working characteristics, *eg flexibility, strengthening, reinforcing, protective, structure, decorative, insulation, elasticity, synthetic, aesthetics, performance, technical, processing*
- texture, *eg rubbery, sandy, waxy, soft, rough, hairy, bumpy, smooth*
- appearance, *eg flat, dull, shiny, glittery*

Reading – through the activities pupils could:

- select relevant information and link to other information, from a range of sources
- undertake independent research using knowledge of how texts, databases, etc are organised and of appropriate reading strategies

Writing – through the activities pupils could:

- organise facts/ideas/information in an appropriate sequence
- group sentences into paragraphs that are clearly focused and well developed
- link ideas and paragraphs into continuous text which is organised and coherent
- show relationships between ideas by links which show purpose, *eg in order to, so that*, and reservation, *eg although, unless, if*
- use punctuation correctly, *eg full stops, commas, dashes, brackets, bullet points, colons*, to extend and clarify sentences

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## Resources

Resources include:

- a collection of products in order to investigate how different materials are used
- tools, equipment and materials to practise finishing techniques
- useful websites, *eg*
  - [www.woolworks.org](http://www.woolworks.org)
  - [www.textile-toolkit.org.uk](http://www.textile-toolkit.org.uk)

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## Future learning

Pupils could go on to a further unit on materials: unit 9A(iii) ‘Selecting materials (textiles)’. Applying an understanding of materials when designing and making is an important part of every design and make assignment.

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## Out-of-school activities and homework

Pupils could:

- investigate clothing of different kinds, exploring how 3-D structures can be produced from 2-D pieces and how key points can be reinforced and protected
- find out about decorative techniques, *eg embroidery, appliqué*. They could collect visual records of their use and record a simple flow chart to show how the effect is achieved
- investigate how and why different textiles are layered and combined in insulating products, *eg sleeping bags, outdoor clothing, cool bags*
- survey users’ reactions to a range of products, including those intended to meet the same need, in order to identify the criteria used to evaluate and compare them

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## Links with other subjects

- ICT: using databases.
- English: displaying and communicating information.

**Learning objectives**

Pupils should learn:

**Possible teaching activities****Learning outcomes**

Pupils:

**Points to note****DESIGN AND MAKE ASSIGNMENT (DMA)**

- to design and make a product, identifying materials that are appropriate for the task, taking into account appearance, function, safety and reliability, by applying the knowledge, skills and understanding they developed during the product evaluation activities and focused practical tasks

Set the pupils a DMA in which they identify and work with materials that are suitable for the task, applying their understanding of the properties of materials.

**Example**

This example DMA below has been written so it can be copied and given directly to pupils. Further information about the context will be needed to make the DMA specific enough for your pupils.

***Finding an identity – decorative techniques on textiles***

Design and print or dye a piece of fabric to make into a scarf or tie that an environmental group could sell to its members.

- take into account appearance, function, safety and reliability
- make preliminary models to explore and test their design thinking
- make their product within constraints
- use their knowledge of how databases are organised, and how to read them to select relevant technical information about materials and processes
- consider a range of materials and methods
- choose materials and methods, and give details of these in a manufacturing specification
- write a report (300 words) justifying and reviewing their choice of materials and methods of making. The report should have a clear focus and include linked paragraphs and topic sentences

**Language for learning when writing a report**

- When pupils write their reports, ask them to:
  - link ideas, *eg on materials selected*, by purpose links, *eg (in order to, so that)*, and reservation links, *eg (although, if)*
  - use appropriate punctuation correctly, *eg colons, brackets, dashes*

**PRODUCT EVALUATION**

Organise a range of activities that give pupils an opportunity to:

- identify the properties of different materials and components and consider why they have been used
- identify possible design weaknesses in the choice or processing of the materials used
- name and describe the methods and processes used to make and finish the product
- specify design criteria and set up tests to evaluate products objectively
- learn words to describe the form and function of products



**Health and safety** – pupils should understand about hazards, risks and risk control when dismantling products. They could carry out risk assessment of the product they are dismantling, to develop their understanding of health and safety issues

■ essential activities

○ optional activities

**Learning objectives**

Pupils should learn:

- about the properties of materials and the characteristics they give to products, and how synthetic fibres can be made to emulate natural fibres
- about ways of processing materials
- how properties and working characteristics of textile materials relate to their structure, and methods for reinforcing and strengthening textiles, *eg through the use of layering, combining and interlining*
- about finishing and decoration and its impact on a product's performance
- about processing, assembly and packaging

**Possible teaching activities**

- Carry out scenario activities. Ask the pupils to discuss choosing materials and processes for a product, *eg a printed or dyed scarf or tie*. Ask them to choose materials and processes from a limited range of options and discuss why they made particular choices, *eg by looking at how fabric reacts or distorts under tension and how stitching reacts*.
- Ask the pupils to examine a collection of items, *eg decorated accessories or garments*, and to investigate the use of different materials. Ask them to explore how the materials have been combined and finished, *eg to carry out a life-cycle analysis of a garment by drawing a flow chart showing the materials from source to disposal*.
- Ask the pupils to look at the impact of different sorts of processing on the end product, *eg to investigate how cotton can be processed*.
- Ask the pupils to investigate the materials used in a range of products, *eg kites, protective clothing, interior furnishing*, and draw up a chart to show the type of fabric, its structure and properties.
- Ask the pupils to investigate finishes and surface decorations used on a variety of materials and discuss how they alter performance characteristics.
- Ask the pupils to disassemble a product, *eg a kit for making a cushion or toy*, and to examine how it was processed, assembled and packaged.

**Learning outcomes**

Pupils:

- apply their understanding of the physical and chemical properties of materials, *eg drape, elasticity, absorbency*, and recognise the connection between the properties of a material, its performance and how it is used
- understand how the properties and working characteristics of textile materials relate to their structure, and how synthetic fibres can be made to emulate or improve on natural fibres
- explain how common sorts of processing change the main characteristics of an end product, *eg brushing cotton makes it softer for duvet covers or children's wear*
- identify what types of fabric have been used for common products, and state their structure and properties
- identify common finishing processes, *eg embroidery*
- understand the processing of raw materials, *eg fibre to yarn to fabric*, and their potential end uses

**Points to note****Language for learning about the properties of materials**

- Remind pupils of the correct names of a range of properties and their spelling and roots, *eg resistance, biodegradable/biodegradability*.

■ essential activities

○ optional activities

Pupils should learn:

Pupils:

### FOCUSED PRACTICAL TASK (FPT)

This practical task should focus on the knowledge, skills and understanding outlined in 'About the unit'. It should give pupils an opportunity to practise any new skills they will need during the DMA, *eg considering finishing processes*.

- how finishing and decorative techniques are used and their potential environmental impact
- Demonstrate to the pupils a range of finishing techniques, *eg painting, dyeing, printing, embroidery, appliqué*, and discuss why they are appropriate to their end use. Discuss with the pupils the difference between improving appearance and improving performance. Discuss the environmental impact and health hazards of different finishing techniques.
- evaluate the benefits and hazards of different finishing techniques and their effect on quality, before deciding which techniques to use, *eg they choose between painting and dyeing, and explain why they chose this finishing technique*

■ essential activities

○ optional activities