

**GCE**

**AS and A Level**

**Design and Technology:  
Product Design (Textiles)**

As exams 2009 onwards

A2 exams 2010 onwards



## 1.2 Why choose Design and Technology: Product Design (Textiles)?

The specification has been designed to encourage candidates to take a broad view of design and technology, to develop their capacity to design and make products and to appreciate the complex relations between design, materials, manufacture and marketing.

The specification retains much of the content of the previous GCE specification and continues to provide candidates with the opportunity to design and make a product (or, in the case of AS, a number of smaller products) in both years of the course.

Changes have been made to the coursework assessment criteria in an effort to assimilate into the major project at A2 the most useful aspects of the Product Study from the previous specification. A revised Candidate Record Form has been introduced in an attempt to limit the volume of work submitted in the folder and provide a focused approach to the whole design-and-make activity.

It is helpful but not necessary for candidates to have studied GCSE Design and Technology before commencing work on this specification and no prior knowledge of design and technology is required for candidates to undertake a course of study based on this specification.

## 1.4 How can I find out more?

### Ask AQA

You have 24-hour access to useful information and answers to the most commonly-asked questions at <http://www.aqa.org.uk/rn/askaqa.php>

If the answer to your question is not available, you can submit a query for our team. Our target response time is one day.

### Teacher Support

Details of the full range of current Teacher Support meetings are available on our website at <http://www.aqa.org.uk/support/teachers.html>

There is also a link to our fast and convenient online booking system for Teacher Support meetings at <http://events.aqa.org.uk/ebooking>

If you need to contact the Teacher Support team, you can call us on 01483 477860 or email us at [teachersupport@aqaa.org.uk](mailto:teachersupport@aqaa.org.uk)

### 3 Subject content

#### 3.1 Unit 1: Materials, Components and Application

Candidates should have the opportunity to study and work with a variety of textile materials to enable them to understand the working characteristics, physical properties, cost and availability which influence the choice of materials in design situations. Knowledge will be required of a wide range of components used in the making of textile products.

Candidates should have a broad knowledge of the manufacturing systems used in the manufacture of textile materials and products for apparel, household and industrial applications. Through critical appraisal of specified products they should understand how materials and components are worked to become parts of a design realisation, initially as toiles, prototypes or models.

Candidates should be encouraged to explore practical applications of processing methods as appropriate to the products they design and make. They should plan suitable production systems for the industrial manufacture of finished prototypes which take into consideration quality assurance and quality control.

Candidates should develop knowledge and understanding of the basic elements of design in order to encourage the application of personal judgement and appropriate criteria in the appraisal of textile products and systems. At the same time, this knowledge should influence candidates in their approach to designing and making quality products that meet specific needs of identified users.

Candidates should have the opportunity to work in both two and three – dimensional forms, engaging in creative activities in which ideas take forms, which satisfy the claims of originality, excellence and utility. They should develop designs from a variety of starting points and respond in an intuitive as well as a systematic manner.

Candidates should gain an understanding of industrial and commercial practices within the area of design and market influences on design in the areas of textiles.

Graphic communication should be used to illustrate construction processes within design portfolios. ICT should be an integral part of the course.

	Knowledge required
<b>Materials and Components</b> <b>1 Fibre types</b>	
Source and classification of the main fibre groups	Understand that fibres come from a variety of different sources and that their qualities are related to the fibre group to which they belong. Candidates should have sufficient outline knowledge of the manufacturing process to enable them to understand how this affects properties, eg melt spinning of synthetic fibres produces smooth continuous filament. Detailed knowledge of processes is not required.
Natural fibres	Plant/cellulose: cotton, linen, ramie Animal/protein: wool, silk, hair
Manufactured fibres	Regenerated fibres: eg viscose, acetate, modal  Synthetic (including microfibres) eg nylon, polyester, acrylic, elastomeric, PVC

<p>Commercial names of fibres and fabrics</p>	<p>Be aware of popular names of natural, manmade and synthetic fibres and fabrics; including Tactel, Lyocell, Tencel, Lycra, polar fleece and Trevira</p>
<p><b>2 Yarns</b></p> <p>Carding, spinning.</p> <p>Yarn types.</p> <p>Blending and mixing of fibres</p>	<p>Understand that fibres need to be made into yarns to manufacture woven and knitted fabrics. The importance of twist.</p> <p>Knowledge of basic yarn types and how they influence the qualities of the fabrics made from them, eg staple and filament yarns, single and plied yarns, textured and bulked yarns, fancy yarns.</p> <p>staple fibre blends, core spun</p>
<p><b>3 Fabric manufacture</b></p> <p>Woven</p> <p>Knitted</p> <p>Non-wovens</p> <p>Smart materials created to provide specific properties</p> <p>Fabric finishes</p> <p>Surface decoration</p>	<p>Knowledge of the structure of the main construction methods and the differences between them. Understanding of the qualities given to the fabrics by the construction methods including typical end-uses.</p> <p>plain (Tabby); twill and satin weaves pile weaves, eg cut/loop pile special effects achieved with coloured yarns and blended fibres, boucle and crepe fabrics</p> <p>weft knits, eg single and double jerseys, rib knit, hand and machine knits. warp knits, including, tricot, velour.</p> <p>production of felts and bonded fabrics.</p> <p>Awareness of a range of different smart fabrics, eg heat reactive, fabrics developed for health and safety applications, performance fabrics</p> <p>Knowledge of the effects of finishes and the reasons they are needed in relation to the fibre/fabric properties and end use of the product. Detailed knowledge of the chemicals involved and methods of application is not required.</p> <p>Brushing, calendering, flame retardancy, water resistance, non-iron/crease resistance, stain resistance, shrink resistance, heat setting to give permanent pleats.</p> <p>Dyeing; domestic and industrial methods (vat, discharge and resist), stages at which dye is applied (fibre, yarn, fabric, finished product), dye fastness. Printing (screen, roller, transfer, ink jet, stencilling). Embroidery, quilting.</p>

<p><b>4 Product components</b></p> <p>Fastenings</p> <p>Trims</p> <p>Threads</p>	<p>Candidates should have knowledge of a variety of components and their appropriateness for a range of products in relation to the end-user, fabric and design considerations.</p> <p>including buttons with buttonholes/ loops, zips, poppers, clips, buckles, clasps, Velcro, D-rings, hooks and eyes, fabric and ribbon ties.</p> <p>including braids, ribbons, piping, edgings, petersham, bindings, fringing, lace, beads, sequins, diamantes, motifs.</p> <p>including sewing threads, embroidery threads, special effect threads.</p>
<p><b>5 Working properties of fibres and fabrics</b></p> <p>Fibre properties</p> <p>Fabric qualities</p> <p>Testing of materials</p>	<p>Knowledge and understanding of the properties of fibres and fabrics and their physical characteristics in relation to their choice for various design solutions.</p> <p>Strength, extensibility, elasticity, fineness, electrostatic charge, lustre, thermal insulation, flammability, moisture absorption, shrinkage.</p> <p>Strength, durability, elasticity, flammability, thermal qualities, creasing, absorption, stretch, formability, handle, drape, weight, pattern repeat, directional pile, nap, texture, lustre.</p> <p>Experience of basic testing to determine appropriate properties in relation to chosen end use. Awareness of fabric testing undertaken in industry.</p>
<p><b>6 Manipulating and combining materials</b></p> <p>Mixtures, blends and laminates Combining materials</p>	<p>Understand the need to combine materials and have outline knowledge of the main methods used.</p> <p>Fibre content, properties and typical applications, reasons for use.</p> <p>Interfacings, underlinings, linings, interlinings; types and applications in relation to fabric weight and construction, and end use of product.</p>

<p><b>Processes and Manufacture</b></p> <p><b>7 Industrial and commercial practice</b></p> <p>Manufacturing systems</p> <p>ICT application</p> <p>Pattern drafting</p>	<p>One-off, batch, mass/line production, vertical, in house production, pre-manufactured components, manufacturing specifications. Response to market demands. Manufacturing sub-systems. Just in time production (JIT)</p> <p>Knowledge and understanding of CAD/CAM for designing and manufacturing processes, fabric production, pattern production, embroidery, garment manufacture.</p> <p>CAD (Computer Aided Design); design of fabrics, products, colourways, product modelling pattern construction.</p> <p>CAM (Computer Aided Manufacture); understanding of fabric manufacture, lay planning, computer controlled cutting, sewing, pressing, decoration.</p> <p>ICT used in the integration of manufacture (CIM).</p> <p>Basic pattern/template drafting including the knowledge and use of technical terms (basic block, labelling and notching, balance marks, seam allowance and ease). Principles of grading. Basic adaptation to create unique individual styles.</p>
<p>Product manufacture</p> <p>Product maintenance</p> <p>Environmental concerns</p> <p>Health and safety</p>	<p>Fabric preparation, lay planning, marking and cutting out, methods of joining, shaping, finishing of edges, selection of construction techniques appropriate to the fabric being used and the product being made. Pressing – use of correct tools. Labelling and packaging.</p> <p>To plan appropriate methods and processes for the manufacture of chosen products, including amendments and adaptations of prototypes and the use of industrial manufacturing processes.</p> <p>Care and maintenance of products. Information shown on care labels, including symbols used. Relationship between care recommendations and fibre/fabric properties.</p> <p>An awareness of the environmental issues in relation to fibre/fabric production and the dyeing of fabrics and piece goods.</p> <p>Risk assessment and health and safety issues related to the manufacture of textile products</p>

<p><b>8 Systems and control</b></p> <p>Quality assurance and quality control</p>	<p>Quality control checks throughout the manufacturing process. Systems diagrams – input, process, output. Loop feedback systems which ensure quality. Awareness of quality and finish in the manufacture of own products.</p>
<p><b>Design and Market Influences</b></p> <p><b>9 Development of design</b></p> <p>History of design</p> <p>Product evolution and product analysis</p>	<p>Study to include some of the major developments of design throughout the nineteenth and twentieth centuries. Understanding of influences on aesthetic attitudes to style and fashion up to the present day.</p> <p>A study of manufactured products to illustrate the way in which the demands of a product have evolved as a result of new materials and technologies. Appraisal of functional, aesthetic, technical and economic considerations in the design and manufacture of products. Consideration of aspects of physical surroundings as shaped by designers, craftsmen and technologists.</p>
<p><b>10 Design in practice</b></p> <p>Design methodology</p> <p>The role of the designer</p> <p>Design sources</p> <p>Aiding the design process</p> <p>Market research</p> <p>The marketing function</p>	<p>Analysis, research, inspiration, idea generation, illustration, modelling, planning, evaluating and testing.</p> <p>An understanding of the varying roles of the commercial designer. Exploring different approaches to designing. Understanding of manufacturing constraints on product design. An awareness of the environmental issues in relation to the design of textile products. Social and moral implications of product design.</p> <p>Candidates should be able to respond to a variety of stimuli. drawing from direct observation of natural and manmade forms, secondary sources in relation to specified design briefs.</p> <p>Use of inspirational moodboards, designer sketchbooks. Analysing working and aesthetic characteristics of a range of materials and surface decoration techniques. Understand industrial process used to produce these effects. Recognising design faults in existing products.</p> <p>Client profiling, identifying target market, consumer and product research, eg opinion polls, questionnaires.</p> <p>Customer identification. An awareness of the use of new technology in the marketing of</p>

<p><b>Product life cycles</b></p> <p><b>Copyright protection</b></p>	<p>textile products. Product costing, calculation and profit. Presentation of colourways.</p> <p>Understanding the expected life cycle of products.</p> <p>The issue of copyright, patenting and its importance to the designer and manufacturer.</p>
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<p><b>11 Communication methods</b></p> <p><b>Illustration</b></p> <p><b>Enhancement</b></p> <p><b>Information drawing</b></p> <p><b>Modelling</b></p> <p><b>Use of ICT</b></p>	<p>Candidates should be able to communicate the detail and form of products, environments and systems so that they may be manufactured.</p> <p>They should be able to identify and use appropriate means to communicate ideas, design proposals and evaluations to a range of audiences, including clients and potential users of the product, eg presentation boards, fashion illustration, interior sketches, swatches, colourways.</p> <p>Selection and use of appropriate 2D/3D techniques, eg sketching, drawing, used of mixed media, collage.</p> <p>Rendering – use of line/tone/colour/form. Texture – to represent materials, surface finishes and applied decoration. Presentation – two-dimensional and three-dimensional products.</p> <p>Quantitative – graphs, piecharts, barcharts, pictograms. Organisational and topological – flowcharts, sequential/schematic.</p> <p>Using three-dimensional form – mock-ups, prototypes, scale models.</p> <p>Selection and use of CAD, word processing/DTP, spreadsheets, databases and modelling software.</p>
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<p><b>12 Design in the human context</b></p> <p><b>Human needs</b></p> <p><b>Human factors</b></p> <p><b>Health and safety</b></p>	<p>Designing to meet physiological, psychological and sociological needs of various groups of people, eg young, elderly, physically handicapped in different environments and communities.</p> <p>Ergonomic and anthropometric influences and constraints. The relationship between people, products and the environment.</p> <p>Risk assessment in relation to the design and manufacture of products. Safety standards imposed by BSI, recommended by the DTI for product design. Recommendations for health and safety at work for employees and its implications for the employer.</p>
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<p><b>Applications/material areas</b></p>	<p>Apparel fabrics to satisfy basic clothing requirements, eg protection, adornment, fashion, utility, sportswear (performance sport and leisurewear), footwear, accessories.  Household fabrics, eg table/bed linen, furnishing accessories, furnishings; floorings.  Industrial textiles, eg fire protective wear, components for vehicles/machines, automotive fabrics, tents, awnings, harnesses, medical textiles.</p>
<p><b>Environmental concerns</b></p>	<p>Use of natural resources, materials utilisation, conservation, waste disposal/management, pollution in broad terms, recycling. Green technology, environmental problems.</p>

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