



Department
for Education

Design and technology

Draft GCSE subject content

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Contents

The content for design and technology GCSE	3
Introduction	3
Subject aims and learning outcomes	4
Subject content	5
Designing and making principles	5
Technical principles	7
Areas of interest	8

The content for design and technology GCSE

Introduction

1. GCSE subject content sets out the knowledge, understanding, skills and learning outcomes common to all specifications in design and technology.
2. GCSE specifications in design and technology should encourage students to understand and apply the iterative design process that can be summarised as explore, create and evaluate. They should encourage students to use creativity and imagination to design and make products¹ or prototypes² that solve real and relevant problems, considering their own and others' needs, wants and values.
3. Students should acquire subject knowledge in design and technology that builds on their key stage 3 learning, incorporating knowledge and understanding of different materials and manufacturing processes in order to comprehensively deliver their concepts and products/prototypes. Students should learn how to take design risks, become resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, students should develop a critical understanding of its impact on daily life and the wider world and understand that high-quality design and technology is essential to the creativity, culture, sustainability, wealth and well-being of the nation.

¹ The word 'product' is understood throughout to be a generic term for all 3D final outcomes of design practice including systems and objects.

² The word 'prototype' is understood throughout to be a generic term for outcomes of design practice that are not final products, instead they could be scaled down products or products made using alternative materials/systems in order to allow a design to be realized. A 'prototype' gives a true indication of a final product's functions, characteristics and quality, but will need further development through commercial manufacture.

Subject aims and learning outcomes

4. GCSE design and technology specifications must ensure that all students can:
 - develop a creative approach to their design development whilst using technical and practical expertise to participate confidently and successfully in an increasingly technological world
 - demonstrate their understanding that all design and technological activity takes place within contexts that influence the outcomes of design practice
 - develop realistic design proposals as a result of the exploration of both user needs and design opportunities
 - develop the skills to critically analyse, evaluate, test and refine their own ideas whilst designing and making
 - communicate their design ideas and decisions using different forms and techniques
 - develop decision making skills through both individual working and consideration of collaborative discourse
 - develop and apply a repertoire of knowledge, understanding and skills in order to design and safely make high quality functional prototypes and/or products by engaging in an iterative design process
 - develop an understanding of materials and resources and how they could be used
 - be ambitious and open to taking design risks in order to stretch the development of design proposals
 - be aware of, and learn from, wider influences on design, including historical, social/cultural, ecological and economic factors
 - be enterprising whilst considering the costs, commercial delivery and marketing of products
 - demonstrate safe working practices in design and technology

Subject content

5. GCSE specifications in design and technology must require students to demonstrate the necessary knowledge, understanding and skills required to undertake the iterative design process of exploring, creating and evaluating.
6. The knowledge, understanding and skills that all students must develop are split into:
 - designing and making principles, and
 - technical principles
7. Specifications must require students to study these principles in the context of one of the areas of interest defined in paragraph 13.
8. Specifications must require students to complete an iterative design and make task. This would not be restricted to that student's chosen area of interest, however, they may apply the knowledge, understanding and skills gained from their chosen area as the basis for undertaking their project.
9. It should be noted that there are no endorsed routes with this qualification. All qualification certificates will be titled GCSE design and technology.

Designing and making principles

10. GCSE specifications in design and technology must require students to demonstrate the ability to:
 - understand that all design and technological practice takes place within contexts that inform outcomes
 - respond to given briefs and also develop their own briefs in response to stimuli
 - be ambitious when designing and making, including continuously developing, taking design risks, testing, critically analysing and evaluating their designs in order to inform their decision making
 - investigate social, ethical, cultural, environmental and economic challenges, in order to identify opportunities and constraints that influence the design process
 - be aware of the availability and cost of materials in relation to the design and manufacture of products
 - investigate and analyse the work/products of past and present designers/ companies in order to help inform their own ideas
 - make informed and justified decisions about their own products/prototypes (and those of others) that identify the potential for further development and deliver solutions for how modification could be delivered

- identify and understand client and user needs through the collection of primary (including consideration of collaborative discourse) and secondary data
- use different design strategies to generate initial ideas and creative intentions
- develop, communicate, record and justify design ideas, applying suitable techniques, for example: writing, sketching, drawing, planning, labelling, annotating, 3-D and mathematical modelling, present orally and digitally and using computer-based tools
- design and develop innovative, functional, aesthetic and marketable products that respond to needs and are fit for purpose
- use specialist tools, techniques, processes, equipment and machinery to produce high quality products/prototypes
- select and work with appropriate materials and components in order to manufacture functioning solutions

Technical principles

11. GCSE specifications in design and technology must require students, irrespective of which area of interest they have chosen, to have knowledge and understanding of:

- how materials work together to create functioning products
- the types and properties of the following natural and man-made materials: papers and cards, woods, metals, plastics, composites, woven and non-woven fabrics and smart/modern materials
- the functions of mechanical fittings and devices, power sources and discrete and programmable components and how they can be applied to products
- new and emerging technologies, including their impact on industries, society and the environment

12. GCSE specifications in design and technology must require students, through one chosen area of interest, to apply knowledge, understanding and skills in relation to:

- the technical requirements needed to ensure the structural integrity and functional performance of products
- the properties and performance characteristics of components and materials in order to achieve functioning solutions
- specialist tools, techniques, processes, equipment and machinery, including computer-aided design and computer-aided manufacture
- alternative processes that can be used to manufacture products to different production scales
- materials stock forms and how to calculate quantities of materials for use in products, including consideration of tolerance and minimising waste

Areas of interest

13. A defining feature of design and technological activities is that they are context dependent, as are the outcomes of such activities. In order to enable students to contextualise their knowledge, understanding and design skills referred to in the subject content, specifications must provide opportunities for study in the following areas of interest:

- **fashion:** distinctive and often habitual trends in style, encompassing not just textiles but extending into different aspects of everyday life. Examples may include, but are not restricted to, clothing, jewellery, accessories and footwear
- **interiors and furnishings:** encompassing that range of products which can be located within buildings, both private and public, that meet user needs in terms of functionality and aesthetics. Examples may include, but are not restricted to, furniture, home accessories and utility items
- **advertising and promotion:** considered to be products that bring services, businesses, events or other products to the interest of the public, delivering promotional awareness or a focus on increasing sales. Examples may include, but are not restricted to, point of sale, digital promotion and branded packaging and products
- **consumer electronics:** those devices that contain electronic circuits and which are intended for everyday use by consumers. Examples may include, but are not restricted to, communication and entertainment devices, and products that fulfil a practical need such as torches or light sensors
- **leisure:** a variety of products used for recreational activities that people engage in during their free time where they are not subject to the demands of work or other routine tasks. Examples may include, but are not restricted to, sportswear, camping and sports equipment, and games and toys
- **mechanical systems:** defined as those products that manage a system of elements that interact on mechanical principles involving forces and movement. Examples may include, but are not restricted to, mobility aids and children's toys



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