

APPROVAL CRITERIA FOR GCSE DESIGN AND TECHNOLOGY



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This is a **Regulatory Document** under **Condition B7** of the *Interim Standard Conditions of Recognition*¹: *Compliance with Regulatory Documents*.

¹ <http://qualificationswales.org/regulation/monitoring-awarding-bodies/?lang=en&>

Introduction

This document sets out the approval criteria for GCSE Design and Technology. These have been developed through stakeholder engagement and public consultation. They include the requirements that an awarding body must meet when developing the specification and assessment materials for the qualification.

The approval criteria in this document will come into effect from 18 July 2016.

Qualifications Wales will only approve qualifications that meet all of the requirements set out in this document together with those set out in the *GCSE Qualification Approval Criteria*² and *Interim Standard Conditions of Recognition*³. In developing qualifications to meet these requirements awarding bodies must have regard to *Fair Access by Design*⁴.

Where the requirements of the Subject Approval Criteria set out in this document differ from those prescribed in the *GCSE Qualifications Approval Criteria* and the *Interim Standard Conditions of Recognition*, the requirements in this document will take precedence.

² <http://qualificationswales.org/regulation/approved-and-designated-qualifications/gcse-approval-criteria-july-2016/?lang=en>

³ <http://qualificationswales.org/regulation/monitoring-awarding-bodies/?lang=en&>

⁴ <http://gov.wales/docs/dcells/publications/150727-fair-access-by-design-en.pdf>

Subject aims and objectives

1. GCSE Design and Technology specifications must enable learners to:
 - 1.1. develop an appreciation of the importance of creativity and innovation to good design practice;
 - 1.2. actively engage in the processes of design and technology to develop as effective and independent learners;
 - 1.3. understand the key principles of designing and making;
 - 1.4. use their knowledge, skills and understanding to make design decisions in order to make a quality prototype⁵;
 - 1.5. analyse existing prototypes⁵ and produce practical solutions to meet needs, wants and opportunities, recognising their impact on quality of life;
 - 1.6. critically analyse links between the principles of good design, existing solutions and technological knowledge;
 - 1.7. understand the underlying technical principles within design and technology within their chosen focus area, with emphasis on emerging technologies, materials and practices.

Subject content

2. The subject content of GCSE Design and Technology specifications must reflect the subject aims and objectives.
3. GCSE Design and Technology specifications must require learners to demonstrate the necessary knowledge, understanding and skills required to undertake iterative design processes including exploring, creating and evaluating.
4. GCSE Design and Technology specifications must require learners to produce at least one final prototype⁵ based on a design brief they develop in response to a contextual challenge set by the awarding body. When completing their project, learners will apply generic and focus area-specific knowledge, understanding and skills. The contextual challenge should:
 - 4.1. offer a broad range of real world contexts, and provide a range of broad and contemporary issues and concerns;
 - 4.2. focus on the needs, wants and values of individuals and groups leading learners to address problems and or opportunities;

⁵ In this document 'prototype' is used to describe all working solutions including products, models and systems.

4.3. be accessible and relevant to the full range of design and technology materials and components⁶.

Knowledge and Understanding

5. GCSE Design and Technology specifications must provide learners with a breadth of technical knowledge and understanding that includes:

5.1. the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems;

5.2. how the critical evaluation of new and emerging technologies informs design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment;

5.3. how energy is generated and stored in order to choose and use appropriate sources to make products;

5.4. developments in modern and smart materials;

5.5. the ecological and social footprint of materials and components;

5.6. the investigation and analysis of the work of past and present professionals and companies in an area of design and technology in order to help inform their own ideas.

6. GCSE Design and Technology specifications must provide learners with a choice of focusing on one of the following areas:

6.1. Engineering Design;

6.2. Fashion and Textiles.

6.3. Product Design.

7. GCSE Design and Technology specifications must require learners, in relation to their chosen focus area, to demonstrate in depth technical knowledge and understanding in relation to the following materials, systems and components:

7.1. Engineering Design: ferrous and non-ferrous metals; thermoforming and thermosetting polymers; electronic systems, including sensors and control devices and programmable components; modern and smart materials and the effect of forces on materials and objects; and mechanical devices.

⁶ When developing design briefs in response to a challenge, learners should not be limited to using only those materials related to their chosen focus area.

- 7.2. Fashion and Textiles: natural, synthetic, blended and mixed fibres, woven and non-woven, and technical textiles; thermoforming and thermosetting polymers; modern and smart materials.
- 7.3. Product Design: papers and boards; natural and manufactured timber; ferrous and non-ferrous metals; thermoforming and thermosetting polymers; modern and smart materials.
8. GCSE Design and Technology specifications must require learners to demonstrate in- depth technical knowledge and understanding in one focus area that includes:
- 8.1. the sources, origins, physical and working properties of materials, components and systems;
 - 8.2. the way in which the selection of materials or components is influenced by a range of factors such as functional, aesthetic, environmental, availability, cost, social, cultural and ethical;
 - 8.3. stock forms, types and sizes in order to calculate and determine the quantity of materials or components required;
 - 8.4. alternative processes that can be used to manufacture products to different scales of production;
 - 8.5. specialist techniques and processes that can be used to shape, fabricate, construct and assemble a high quality prototype⁷;
 - 8.6. appropriate surface treatments and finishes that can be applied for functional
 - 8.7. and aesthetic purposes.

Skills

9. GCSE specifications in design and technology must require learners to:
- 9.1. understand that all design and technological practice takes place within contexts which inform outcomes;
 - 9.2. identify and understand client and user needs through the collection of primary and secondary data;
 - 9.3. demonstrate an ability to write a design brief and specifications from their own and others' considerations of human needs, wants and interests;

⁷ In this document 'prototype' is used to describe all working solutions including products, models and systems.

- 9.4. investigate factors, such as environmental, social and economic challenges, in order to identify opportunities and constraints that influence the processes of designing and making;
- 9.5. explore and develop their ideas, testing, critically analysing and evaluating their work in order to inform and refine their design decisions thus achieving improved outcomes;
- 9.6. use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation;
- 9.7. develop, communicate, record and justify design ideas, applying suitable techniques;
- 9.8. design and develop at least one prototype⁸ that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation;
- 9.9. make informed and reasoned decisions, respond to feedback about their own prototypes⁸ (and existing products and systems) to identify the potential for further development and suggest how modifications could be made;
- 9.10. select and work with appropriate materials and components in order to produce a prototype⁸;
- 9.11. use appropriate and accurate marking out methods to create a specific outcome;
- 9.12. use specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype⁸, as appropriate to the materials and/or components being used;
- 9.13. use appropriate surface treatments and finishes for functional and aesthetic purposes.

Assessment objectives

10. The assessment of the knowledge, understanding, and skills required in the specification must target the following assessment objectives in line with the indicated weightings:

⁸ In this document 'prototype' is used to describe all working solutions including products, models and systems.

Objective	Requirements	Weighting
AO1	Identify, investigate, analyse and outline design possibilities to address needs and wants	10%
AO2	Design and make prototypes ⁹ and evaluate their fitness for purpose	40%
AO3	Analyse and evaluate – <ul style="list-style-type: none"> • design decisions and outcomes in relation to products • wider issues in design technology 	10%
AO4	Demonstrate and apply knowledge and understanding of design and technology principles.	40%

Scheme of assessment

11. GCSE Design and Technology specifications must include non-examination assessment which:

- 11.1. is assessed through a portfolio of evidence and a prototype⁹ produced by the candidate;
- 11.2. contributes to 50 percent of the qualification assessment weighting;
- 11.3. includes marks allocated from AO1 and AO2.

12. Assessment of GCSE Design and Technology specifications must be linear.

13. Assessment of GCSE Design and Technology specifications must not be tiered.

⁹ In this document 'prototype' is used to describe all working solutions including products, models and systems.

Further information

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