SUBJECT & QUALIFICATION: GCSE in Design and Technology

Why is the study of GCSE in Design and Technology important?

The WJEC Eduqas GCSE in Design and Technology offers a unique opportunity in the curriculum for learners to identify and solve real problems by designing and making products or systems. Through studying GCSE Design and Technology, learners will be prepared to participate confidently and successfully in an increasingly technological world; and be aware of, and learn from, wider influences on design and technology, including historical, social/cultural, environmental and economic factors.

What skills will the study of GCSE Design and Technology teach you?

The specification enables learners to work creatively when designing and making and apply technical and practical expertise, in order to:
• 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 design opportunities and users' needs, wants and values
• use imagination, experimentation and combine ideas when designing • develop the skills to critique and refine their own ideas whilst designing and making
• communicate their design ideas and decisions using different media and techniques, as appropriate for different audiences at key points in their designing
• develop decision making skills, including the planning and organisation of time and resources when managing their own project work
• develop a broad knowledge of materials, components and technologies and practical skills to develop high quality, imaginative and functional prototypes
• be ambitious and open to explore and take design risks in order to stretch the development of design proposals, avoiding clichéd or stereotypical responses
• consider the costs, commercial viability and marketing of products • demonstrate safe working practices in design and technology
• use key design and technology terminology including those related to: designing, innovation and communication; materials and technologies; making, manufacture and production; critiquing, values and ethics

What will you know and understand from your study of GCSE Design and Technology teach you?

The subject content is presented under two headings: technical principles and designing and making principles. Within each area, the content is further divided into core knowledge and understanding and in-depth knowledge and understanding.
The specification content and assessment requirements are designed to ensure learners develop an appropriate breadth and depth of knowledge and understanding in design and technology.

2.1 Technical principles

Core knowledge and understanding is presented in five clear and distinct topic areas:

• design and technology and our world
• smart materials
• electronic systems and programmable components
• mechanical components and devices
• materials

Learners are required to study all of the content in these five areas, to ensure they have a broad knowledge and understanding of design and technology and that they are able to make effective choices in relation to which materials, components and systems to utilise within design and make activities.

In-depth knowledge and understanding is presented in six clear and distinct topic areas:

a. electronic systems, programmable components & mechanical devices
b. papers & boards
c. natural & manufactured timber
d. ferrous & non-ferrous metals
e. thermoforming & thermosetting polymers
f. fibres & textiles

Learners are required to study at least one of these six areas **(natural and manufactured timbers)**, to ensure they have an in-depth knowledge and understanding of a specific material area and/or components and systems to support their design and make activities.

How can you deepen your understanding of GCSE Design and Technology?

Attend enrichment on a Friday.
Revising at home.
Purchase : Practise mock exams go to the following link :
https://www.eduqas.co.uk/media/bjrfyytf/gcse-design-and-technology-sams.pdf
https://www.technologystudent.com/despro_flsh/new_revison1.html

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How are you assessed in GCSE Design and Technology?

Component 1 - Design and Technology in the 21st Century Written examination: 2 hours 50% of qualification (100 marks).
A mix of short answer, structured and extended writing questions assessing candidates' knowledge and understanding of one area selected from: technical principles • designing and making principles along with their ability to • analyse and evaluate design decisions and wider issues in design and technology.

Component 2 - Design and make task Non-exam assessment: approximately 35 hours 50% of qualification (100 marks).

A sustained design and make task, based on a contextual challenge set by WJEC, assessing candidates' ability to:
- identify, investigate and outline design possibilities
- design and make prototypes
- analyse and evaluate design decisions and wider issues in design and technology.

Key Assessment Objectives

The key learning objectives for* GCSE Design and Technology *are:

UNIT 2.1 - EXAM
Technical Principles - Core Knowledge and Understanding
This section is designed to develop learners' knowledge and understanding in design and technology and its impact on daily life. Learners should develop a broad understanding of materials, systems and processes and have the opportunity to apply knowledge and understanding from other subject areas including mathematics and science.

Learners need a breadth of technical knowledge and understanding in order to make effective choices in relation to the selection of materials, components and systems. They should consider emerging technologies, environmental issues and impacts on society. They should consider the needs of future generations as well as their own, and take a broad view of the impact of design and technology activities.

1. The impact of new and emerging technologies on: • industry • enterprise • sustainability • people • culture • society • the environment • production techniques • systems
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
3. How energy is generated and stored in order to choose and use appropriate sources to make products and to power systems
4. Developments in modern and smart materials, composite materials and technical textile
5. How electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs
6. The use of programmable components to embed functionality into products in order to enhance and customise their operation
7. The functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces
8. Papers and boards
9. Natural and manufactured timber
10. Ferrous and nonferrous metals
11. Thermoforming and thermosetting polymers
12. Natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles.
Technical Principles - In-depth knowledge and understanding

Learners are required to develop an in-depth knowledge and understanding in relation to at least one of the following:
• electronic systems, programmable components & mechanical devices.
• papers & boards.
• natural & manufactured timber.
• ferrous & non-ferrous metals.
• thermoforming & thermosetting polymers.
• natural, synthetic, blended and mixed fibres; woven, non-woven and knitted textiles.

UNIT 2.2 - NEA
Core knowledge and understanding that learners are required to develop and apply is presented in ten clear topic areas:
• understanding design and technology practice
• understanding user needs
• writing a design brief and specifications
• investigating challenges
• developing ideas
• investigating the work of others
• using design strategies
• communicating ideas
• developing a prototype
• making decisions

Learners are required to cover all of the content in these ten areas, to ensure they are able to apply a broad knowledge and understanding of design and technology principles within design and make activities. In-depth knowledge and understanding is presented in five clear topic areas:
• selecting and working with materials and components
• marking out
• using tools and equipment
• using specialist techniques
• using surface treatments and finishes

Learners are required to cover all of the content in these five areas, in relation to at least one of the topic areas identified in the in-depth knowledge and understanding section of technical principles.

Coursework requirements

The contextual challenge requires learners to demonstrate, at GCSE level, their knowledge and understanding of the following core designing and making principles, in the context of a sustained design and make activity. Learners are required to:
• work within a context which will inform the outcome
• identify and understand client and user needs

- write a design brief and specifications
- identify opportunities and constraints that influence the processes of designing and making
- explore, develop, test, critically analyse and evaluate ideas
- investigate and analyse the work of others
- use different design strategies to generate initial ideas
- develop, communicate, record and justify design ideas
- design and develop at least one prototype* that is fit for purpose
- make informed and reasoned decisions to identify the potential for further development

In addition, when designing and making in relation to at least one material or component/ system(s) learners are required to:
- select and work with appropriate materials and components to produce a prototype
- use appropriate and accurate marking out methods; work within tolerances; understand efficient cutting and minimise waste
- use specialist tools and equipment, appropriate to the materials or components used, to create a specific outcome
- use specialist techniques and processes to shape, fabricate, construct and assemble a high quality prototype, as appropriate to the materials and/or components being used
- use appropriate surface treatments and finishes

* In the context of this component, 'prototype' is used to describe all working solutions including products, models and systems.

How can GCSE Design and Technology support your future?

It provides a suitable foundation for the study of design and technology at either AS or A level. In addition, the specification provides a coherent, satisfying and worthwhile course of study for learners who do not progress to further study in this subject.

Study of GCSE in Design and Technology can lead to a wide range of careers:

Engineering traces (mechanical/electrical/systems), Construction trades (joinery, carpentry) design Architectural/Design Technician.

GCSE Design and Technology				
Term	Year 1 - Component 1	Component 2	Year 2 - Component 1	Component 2
Autumn 1	**Core Knowledge** 1. The impact of new and emerging technologies on: • industry • enterprise • sustainability • people • culture • society • the environment • production techniques • systems 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	Introduction to component 2. Understanding design and technology practice, Investigating challenges. Understanding user needs. Writing design briefs and specifications. **Chinese puzzle**	**Specialist Knowledge Revision**	Understanding design and technology practice, Investigating challenges. Understanding user needs. Writing design briefs and specifications.
Autumn 2	**Core Knowledge** 3. How energy is generated and stored in order to choose and use appropriate sources to make products and to power systems 4. Developments in modern and smart materials, composite materials and technical textile	Developing ideas. **Alien wire wrap**	**Specialist Knowledge Revision**	Developing ideas. Investigating the work of others. Using design strategies to communicate ideas.
Spring 1	**Core Knowledge** 5. How electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs 6. The use of programmable components to embed functionality into products in order to enhance and customise their operation	Investigating the work of others. Using design strategies to communicate ideas.	**Specialist Knowledge Revision**	Developing prototypes. Manufacturing.
Spring 2	**Core Knowledge** 7. The functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces	Developing prototypes. **Coat hook**	**Revision**	Evaluations.
Summer 1	**Core Knowledge Revision**	Manufacturing. **Wooden toy with interactive part.**	**Revision**	
Summer 2	**Core Knowledge Revision**	Evaluations.	**Revision**	