

Design and Technology

Key Stage 4

GCSE DT Timbers

The Pearson Edexcel GCSE (9-1) in Design and Technology (1DT0/1F – Timbers)

Introduction

The GCSE in Design and Technology enables students to understand and apply iterative design processes through which they explore, create and evaluate a range of outcomes. The qualification enables students to use creativity and imagination to design and make prototypes (together with evidence of modelling to develop and prove product concept and function) that solve real and relevant problems, considering their own and others' needs, wants and values.

It gives students opportunities to apply knowledge from other disciplines, including mathematics, science, art and design, computing and the humanities.

Students will acquire subject knowledge in design and technology that builds on Key Stage 3, incorporating knowledge and understanding of different materials and manufacturing processes in order to design and make, with confidence, prototypes in response to issues, needs, problems and opportunities.

Students learn how to take design risks, helping them to become resourceful, innovative and enterprising citizens. They should develop an awareness of practices from the creative, engineering and manufacturing industries. Through the critique of the outcomes of design and technology activity, both historic and present day, students should develop an understanding of its impact on daily life and the wider world and understand that high-quality design and technology is important to the creativity, culture, sustainability, wealth and wellbeing of the nation and the global community. In the context of this document, the term 'prototype' refers to a functioning design outcome. A final prototype could be a highly-finished product, made as proof of concept before manufacture, or working scale models of a system where a full-size product would be impractical.

Qualification aims and objectives

The study of design and technology seeks to prepare students to participate confidently and successfully in an increasingly technological world. It helps students to be aware of, and learn from, wider influences on design and technology, including historical, social/cultural, environmental and economic factors. The aims and objectives of this qualification are to enable students to:

- ♣ demonstrate their understanding that all design and technological activity takes place in 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 while 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.

Course break down

- ♣ 50% exam (Core A and Specialism Core B – Timbers to be taken at the end of May in Year 11)
- ♣ 50% coursework (A different theme set each year by the exam board and there are four parts: Investigate, Design, Make, Evaluate to the NEA)
- ♣ Submission for both is in Year 11

Exam assessment overview

- ♣ The paper consists of two sections. Section A is assessed on the core content and Section B is assessed on the material category 1DT0/1F – Timbers
- ♣ Calculators may be used in the examination. Calculators.
- ♣ Section A: Core This section is 40 marks and contains a mixture of different question styles, including open-response, graphical, calculation and extended-open-response questions. There will be 10 marks of calculation questions in Section A.
- ♣ Section B: Material categories This section is 60 marks and contains a mixture of different question styles, including open-response, graphical, calculation and extended-open-response questions. There will be 5 marks of calculation questions in Section B.

Coursework assessment overview

- ♣ Students will undertake a project based on a contextual challenge released by us a year before certification.
- ♣ This will be released on 1st June and will be available on our website.
- ♣ The project will test students' skills in investigating, designing, making and evaluating a prototype of a product.
- ♣ Task will be internally assessed and externally moderated.
- ♣ The marks are awarded for each part as follows. 1 – Investigate (16 marks) o 2 – Design (42 marks) o 3 – Make (36 marks) o 4 – Evaluate (6 marks)

Henlow Academy structure

- ♣ 2-year course
- ♣ Theory completed in Year 10 alongside practical and design skills.
- ♣ Exam skills preparation throughout the 2 years. Mock exam at the end of Year 10 and another one in Year 11.
- ♣ Coursework is started in June in Year 10 and completed in Easter in Year 11.
- ♣ Maths and science element included in the course. Students will need a scientific calculator for the exam.
- ♣ Practical work will build on established and new skills using current machinery, tools and equipment in the department.
- ♣ This will lead to A Level Product Design and A Level Engineering in Sixth form and Design/Engineering/Architecture university courses post A Level.

Intent	Implementation					
	Year 10 (Term1)	Year 10 (Term 2)	Year 10 (Term 3)	Year 11 (Term 1)	Year 11 (Term 2)	Year 11 (Term 3)
Theory	Timbers theory	Core theory	Core theory			
	7.1 Design context	1.1 The impact new and emerging technologies	1.10 Thermoforming and thermosetting polymers			
	7.2 Sources of timber	1.2 Evaluating new and emerging technologies informs design decisions	1.11 The categorisation of fibre, and textiles			
	7.3 Selection of timber	1.3 Energy: generation, storage and choosing appropriate sources	1.12 Natural and manufactured timbers			
	7.4 strengthening timber	1.4 Smart and composite materials, and technical textiles	1.13 All design and technological practice takes place within contexts with inform outcomes			
	7.5 Stock forms and sizes	1.5 Mechanical devices used to produce movement	1.14 Challenges that influence the processes of design and making			
	7.6 Manufacturing processes	1.6 Electronic systems	1.15 Investigate and analyse the work of professionals and companies to inform design			
	7.7 Equipment and processes used to make prototypes	1.7 Programmable components	1.16 Use of different design strategies			
		1.8 Categorisation of ferrous and non-ferrous metals	1.17 Using communication techniques to present design ideas			
		1.9 Papers and boards				
Impact theory	Maths theory	Exam questions	Mock Exam	Exam questions	Mock Exam	External exam at the end of May in Year 11

Impact Practical	Money box	Caddy	Design techniques	Testing of materials/processes	Prototype	Finish practical product
Impact Coursework			1 – Investigate This includes investigation of needs and research, and a product specification	2 – Design This includes producing different design ideas, review of initial ideas, development of design ideas into a chosen design, communication of design ideas and review of the chosen design	3 – Make This includes manufacture, and quality and accuracy 4 – Evaluate This includes testing and evaluation.	Coursework handed in to the exam board