



KS4 Curriculum Overview

Product Design AQA GCSE

Curriculum Intent

By completing this course students will develop a much deeper understanding of the properties of the objects they come into contact with on a daily basis. Through working with materials and creating products, students come to appreciate and respect the complex planning process behind these items. We then develop this concept to consider the relationships between the society we live in and the impact of their designs considering life cycle, production values and further ethical quandaries equipping them to be the new generation of ethical thinkers and consumers saving our planet.

Students should be able 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.

How does the KS4 curriculum build on that from KS3?

At Downham Market Academy the subject of KS3 design technology is broken down into smaller rotations throughout the year, these include food, graphics, textiles, engineering and product design. By the end of KS3 all students should have had an opportunity to carry out a variety of projects using a range of disciplines and master some key skills from each of these areas allowing them to flourish and understand the world around them.

Students will learn to:

- Use creativity and imagination to design and make products that solve real and relevant problems including those encountered in their everyday lives.
- Build resilience and confidence to face challenges whilst raising their self esteem and developing new personal interests.
- Be able to work within a range of contexts, considering their own and others' needs, wants and values.
- Acquire a broad range of subject knowledge whilst learning how to take risks and becoming a resourceful, innovative, enterprising and capable citizen in an increasingly technological world.

At KS4 students are offered the opportunity to specialise in courses related to hospitality and catering, engineering and product design. These courses build on the skills, knowledge and understanding gained in KS3 using the design, make, evaluate model into a more industry ready approach. For example, rather than just producing annotated sketches and design ideas at KS3, in KS4 students are expected to support their generation of ideas with accurate drawings justifying all aspects of client needs and wants. Students at KS4 use a wider range of materials, techniques and processes and are expected to be mastering their own design style and approach, justifying their choices taking into account a deeper appreciation of the impact of their designs.

What do students *do* with this knowledge or these skills?

The key features of this course are core technical principles, specialist technical principles, and designing and making principles. In unit 1 the understanding of these principles are assessed. In unit 2 the practical application of these principles are then assessed through a design and make task.

- Students will identify and investigate design possibilities.
- Students will produce a design brief and specification.
- Students will generate and develop design ideas.
- Students will realise their design ideas.
- Students will analyse and evaluate their design ideas and prototypes.

How does the KS4 curriculum align to the National Curriculum?

- There is no specific KS4 DT curriculum, however there are numerous opportunities for the KS4 DT opportunities we offer to align with other subjects to provide a broad and balanced approach across the school. E.g.
- Investigating other cultures and designers.
- Teamwork, cooperation and participation. developing social skills, creativity, confidence and independence.

- Recycling, sustainability and ethics.
- Working mathematically - developing fluency, reasoning and solving problems. Number, algebra, ration, proportion, rates of change, geometry, measure, probability.
- English – spoken language, reading, writing, developing vocabulary.
- Science – working scientifically, biology, chemistry, physics.
- How technology can solve problems, new and emerging technologies.

What new knowledge or skills are students taught?		
Term	Year 10	Year 11
Autumn	<p>3.1 Core technical principles.</p> <ul style="list-style-type: none"> • new and emerging technologies • energy generation and storage • developments in new materials • systems approach to designing • mechanical devices • materials and their working properties. <p>Metal based design and manufacture practical project</p>	<p>NEA Section A / Identifying and Investigating Design Possibilities NEA Section B / Producing a Design Brief and Specification NEA Section C / Generating Design Ideas</p> <ul style="list-style-type: none"> • Context • Problem analysis / Client / Target Audience / Design Brief • Current solutions x4 / analysis – aesthetics, cost, customer, environment, size, safety, function, materials, manufacturing • Market Research /results / analysis • Anthropometrics/ Ergonomics/ Analysis • Packaging information/ analysis • Design Specification • Four three dimensional Design Idea / analysis – aesthetics, cost, context , client, target audience, size, safety, function, materials, manufacturing
Spring	<p>3.2 Specialist technical principles.</p> <ul style="list-style-type: none"> • selection of materials or components • forces and stresses • ecological and social footprint • sources and origins • using and working with materials • stock forms, types and sizes • scales of production • specialist techniques and processes • surface treatments and finishes. 	<p>NEA Section D / Developing Design Ideas NEA Section E / Realising Design Ideas</p> <ul style="list-style-type: none"> • Final Idea - three dimensional final Idea / analysis must explain design decisions – aesthetics, cost, context , client, target audience, size, safety, function, materials, manufacturing • 3 Dimensional development , modelling ,photographic evidence supported by written commentary investigating how different appropriate manufacturing process' and appropriate materials could be used to produce a 3

	Wood based design and manufacture practical project	<p>dimensional functional prototype</p> <ul style="list-style-type: none"> • Construction plan • Orthographic / Isometric • Templates / model • Use of industrial manufacturing methods • Appropriate and accurate use of hand tools / machinery to produce the final solution • Final Prototype is functional , produced and finished to a high Standard
Summer	<p>3.3 Designing and making principles.</p> <ul style="list-style-type: none"> • investigation, primary and secondary data • environmental, social and economic challenge • the work of others • design strategies • communication of design ideas • prototype development • selection of materials and components • tolerances • material management • specialist tools and equipment • specialist techniques and processes <p>Plastic / card based design and manufacture practical project</p>	<p>NEA Section F / Analysing and Evaluating</p> <ul style="list-style-type: none"> • Photographic evidence / what went well / even better if evaluation • Evidence of Evaluation throughout design folder • Specification Evaluation • Market Research Evaluation
Rationale for this sequencing	The qualification is 50% Examination / 50% Non Examination Assessment. The core knowledge and practical skills prepare students for examination aspect of the course and underpin the NEA unit expectations of the qualification, so they need to be taught in Year 10.	The NEA Design context is not released by AQA until the end of Year 10, therefore students cannot start it until Year 11. The NEA work produced is expected to draw upon the knowledge and understanding taught in Year 10 and further develop their understanding of Design and manufacturing principles.

Additional support at home

<p>Additional reading for enjoyment, enhancement and extension</p>	<ul style="list-style-type: none"> • The Language of Things. Deyan Sudjic. • Stuff Matters. Mark Miodownik. • Why Shrink Wrap A Cucumber? Stephen Aldridge • No More Plastic. Martin Dorey. • Process: 50 designs from concept to manufacture. Jennifer Hudson. • Design for the 21st Century – Charlotte Fiell.
<p>Online resources to practice, consolidate and revise</p>	<ul style="list-style-type: none"> • Print The Legend – Netflix. • Abstract: The Art of Design – Netflix. • Design Matters – Debbie Millman podcast. • Technologystudent.com • BBC Bitesize – AQA GCSE D&T
<p>Workbooks & revision guides to practice, consolidate and revise</p>	<ul style="list-style-type: none"> • Design and Technology Dictionary. • Design and Technology illustrated revision and practice. • CGP D&T complete revision and practice. • CGP D&T revision book. • CGP D&T exam practice workbook. • CGP D&T revision question cards.