



Design Technology

Key Stage 4 (Years 10 and 11)

At Key Stage 4, students can choose Product Design, Engineering or Food Preparation and Nutrition.

Product Design

Qualification AQA GCSE Design and Technology (8552).

Unit	Topic	What students learn	Term
Year 10			
Unit 1	Core drawing skills and theory	Isometric, exploded and orthographic drawing, rendering and stencil design in 2D Design for laser cutting; theory on sustainability, finite and non-finite resources, technology push and market pull, pollution and planned obsolescence.	Autumn 1
Unit 2	Frame project and theory	Making a wooden frame with mitre, bridle, dowel and lap joints; using the router, strip heating, jigs and templates; surface finishes; production plans; theory on new technologies, industry practice (lean, JIT, automation) and modern and composite materials.	Autumn 1 – Autumn 2
Unit 3	CAD with Onshape and theory	3D modelling, assemblies and orthographic drawings in Onshape; scales of production; timbers and their properties; assessment.	Autumn 2 – Spring 1
Unit 4	Pots and processes and theory	Workshop processes including the lathe, laminating, riveting and the scroll saw; deforestation, FSC and recycling of timber; revision for assessment.	Spring 1
Unit 5	Mini mock NEA: lighting project	A practice design-and-make task: exploring a brief, research, specification, ergonomics and anthropometrics, design ideas and development, CAD and making a light; theory on timber, plastics, metals, smart materials, specialist equipment and forces.	Spring 2 – Summer 1
Unit 6	NEA: research	Starting the non-examined assessment: analysing the contextual challenge, identifying a client and their needs, researching existing products, mood boards, design brief and specification, and initial ideas.	Summer 2
Year 11			
NEA	Design and develop	Further research, design brief and specification, rapid and initial ideas and their evaluation; theory on mechanical devices (levers, linkages, cams, pulleys and gears) and electronic systems.	Autumn 1
NEA	Develop and make (with mock 2)	Developing selected ideas through quality modelling and material testing to a final design, orthographic drawings and cutting lists; theory on smart materials, technical textiles and fabrics.	Autumn 2

Unit	Topic	What students learn	Term
NEA	Make	Manufacturing a quality final product with a manufacturing diary; theory on renewable energy, forces and reinforcement, and surface finishes; mock exams.	Spring 1
NEA	Evaluate (with mock 3)	Completing the final product and writing the evaluation.	Spring 2
Exam revision	Theory and exam technique	Quality control, timber-based materials, units and calculations, paper and board, and non-renewable energy; exam technique.	Summer 1

Engineering

Qualification WJEC Level 1/2 Technical Award in Engineering (5799QA).

In Year 10, practical projects run alongside fortnightly theory lessons.

Unit	Topic	What students learn	Term
Year 10			
Practical unit	Aluminium key fob	An introduction to engineering through making an aluminium key fob from an engineering drawing: annotating drawings, marking out, drilling, COSHH and finishing, production planning and evaluation.	Autumn 1
Theory (fortnightly)	Engineering materials and manufacturing	Properties and uses of ferrous and non-ferrous metals, plastics and composites; CAD/CAM and its impact on industry; engineering maths for area, volume and formulae; end-of-term assessment.	Autumn 1 – Autumn 2
Design unit	Orthographic and sectional drawing	Reading and creating third-angle orthographic projections and sectional views.	Autumn 1
Practical unit	Mild steel coat hook	Stock forms, marking out and filing, safe use of the pillar drill, forming and threading, joining with pop rivets, finishing and production planning.	Autumn 1 – Autumn 2
Design unit	CAD with Onshape	Creating 3D CAD models and orthographic drawings in Onshape.	Autumn 2 – Spring 1
Practical unit	Acrylic pencil holder	Safe use of laser cutters; forming, shaping and finishing plastics; planning for manufacture, contingency planning and evaluation.	Spring 1
Theory (fortnightly)	Engineering in the modern world	How engineers respond to environmental, electrical, structural, mechanical and technological challenges: sustainability and lifecycle analysis, Ohm's Law, bicycle design, rollercoasters and smart devices; end-of-term assessment.	Spring 1 – Spring 2
Practical unit	Manufacturing engineering products: fan project	Annotating drawings and engineering symbols, 3D printing, cutting lists, risk assessments and contingency plans, time and production plans, sheet-metal manufacture, a diary of manufacture and evaluation of the prototype.	Spring 2 – Summer 1
Theory (fortnightly)	Testing, processes and machinery	How engineers test materials, choose manufacturing processes and use machinery safely; mock paper.	Summer 1 – Summer 2
Year 11			
Unit 1	Assessment: Manufacturing engineered products	A 20-hour assessment combining directly and indirectly supervised work.	Autumn 1 – Autumn 2

Unit	Topic	What students learn	Term
Unit 2	Assessment: Designing engineered products	A 10-hour controlled assessment.	Spring 1 – Spring 2
Unit 3	Exam revision	Revision of materials and properties, joining methods, heat processes, testing, maths, manufacturing processes, sustainability, machines, smart materials, technical drawing and CAD/CAM; mock exam.	Spring 2 – Summer 1

Food Preparation and Nutrition

Qualification AQA GCSE Food Preparation and Nutrition (8585).

Unit	Topic	What students learn	Term
Year 10			
Unit 1	Course Outline, Food Provenance & British Cuisine	Knowledge: the course structure and assessment; food provenance, with a focus on British cuisine. Skills: knife skills, food safety and hygiene, and correct use of equipment.	Autumn 1
Unit 2	Nutrition: Macronutrients (Protein, Fats, Carbs)	Knowledge: the functions and sources of protein, fats and carbohydrates, the effects of deficiency and excess, and how cooking affects them. Skills: knife skills, poaching eggs and safe oven use.	Autumn 2
Unit 3	Nutrition: Micronutrients & Water	Knowledge: the roles of vitamins and minerals, deficiency and excess, and water balance. Skills: knife skills, measuring, and cooking methods that retain nutrients.	Spring 1
Unit 4	Food Science: Heat Transfer & Raising Agents	Knowledge: the science of cooking, including heat transfer, raising agents and the functional and chemical properties of food. Skills: structuring experiments, food testing and advanced cooking methods.	Spring 2
Unit 5	Food Spoilage, Micro-organisms & Food Safety	Knowledge: the principles of food safety, bacteria in food and the use of enzymes in food production. Skills: practical food safety and storing food correctly.	Summer 1
Unit 6	Time Plans, Exam Practice & Mock NEA1	Knowledge: sequencing and dovetailing recipes; mock NEA1 practice. Skills: creating time plans and revising exam content.	Summer 2
Year 11			
Unit 7	NEA1: Food Science Investigation	Knowledge: the working characteristics and chemical and functional properties of ingredients. Skills: research, testing, analysis and evaluation.	Autumn 1
Unit 8	NEA1/2: Food Preparation Task (Planning & Skills)	Knowledge: investigating a dietary group, life stage or culinary tradition. Skills: cooking and presenting dishes to demonstrate technical skills.	Autumn 2
Unit 9	NEA2: Food Preparation Task (Menu Planning)	Knowledge: analysing and evaluating dishes and comparing costs. Skills: advanced dish preparation and presentation.	Spring 1
Unit 10	NEA2: Food Preparation Task (Final Dishes & Evaluation)	Knowledge: food production methods and their environmental impact. Skills: making the final dishes and evaluating them.	Spring 2
Unit 11	Exam Preparation & Revision	Knowledge: revision of all course content. Skills: exam technique and practice papers.	Summer 1