



Long Term Plan

DT

KS4(Year 10,11)

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Subject Intent / Vision: KS4 Design & Technology

The KS4 Design & Technology curriculum teaches students how to solve real-world problems by designing, testing, and making functional, high-quality products.

Key Objectives:

- **Practical & Technical Skills:** Master hand tools, workshop machinery, CAD/CAM, and material processing across timbers, metals, and polymers.
- **Iterative Design:** Research user needs, sketch concepts, build physical prototypes, test performance, and refine designs.
- **STEM Integration:** Apply material science, mechanical principles, structural calculations, and technical drawing standards.
- **Product Evaluation:** Critically analyze existing commercial products, emerging technologies, and student prototypes.
- **Sustainability & Ethics:** Understand circular design, material lifecycles, sustainable sourcing, and low-impact manufacturing.
- **Career Readiness:** Build project management, technical communication, and practical skills for engineering, design, and manufacturing pathways.

Through this curriculum, students will:

- Become confident, independent practical problem-solvers.
- Gain fluency in technical drawing, material selection, and digital manufacturing.
- Understand the environmental, social, and economic impacts of modern production.
- Prepare for further study, apprenticeships, and careers in STEM, design, and engineering.

Delivery: Delivered through practical workshop training, iterative design projects, core technical theory, and targeted exam preparation.

To enable all students to achieve, our subject curriculum is underpinned by the following principles:



Ambitious - *The art curriculum is planned backward ensuring a deep and purposeful sequence of activities for a wider knowledge, instead of narrow learning episodes.*



Sequenced / Spiral – *Key learning (and practical skills) is repeated throughout the curriculum for equal access, regardless of the students starting point during the academic year.*



Literacy - *Key learning is embedded through contextual studies, giving students a chance to think and write critically about responses or personal outcomes. Students also write about the process and materials relevant to their project.*



Cultural Capital – *The department is committed to expose students to a range of artists and designers throughout the curriculum and gallery visits and is working towards building a relationship with local creative people and institutions to organise visits and workshops.*

KS4 DT Programme of Study (YEAR 10)

Autumn 1:	Autumn 2/Spring 1	Spring 2/Summer 1	Summer 2
Introduction to DT Skill Blast project (Prototype Project) • Papers & Boards: Learn about paper weights (gsm), board types, and material properties to choose the right stock for prototypes. • Methods of Production: Compare one-off, batch, and mass production methods used in both model making and industry. • Stock Forms: Understand standard paper sizes (A0–A6), board thicknesses, and standard commercial stock forms. • Hand Tools & Accuracy: Practice precise marking out, scoring, and cutting using scalpels, craft knives, safety rulers, and cutting mats. •	Games Controller Project Timbers & Bag Press: Use timber veneers and lamination techniques in a vacuum bag press to mold curved, ergonomic controller grips or outer shells. Metal Work & Metal Lathe: Safely set up and operate a metal lathe to turn, face, and shape custom metal parts like thumbsticks, buttons, or spacers. Brazing: Practice high-temperature metal joining techniques using flux and brazing rod on a brazing hearth. Printing: Create and transfer graphics, button markings, and logos using vinyl cutting Surface Finishes & Treatments: Sand, polish, and apply appropriate protective finishes (lacquer, paint, wax, or metal polishes) to wood and metal parts. Advertising & Packaging: Design and construct flat-net retail box packaging, branding, and promotional materials tailored to a specific target audience.	Wooden Storage Organiser Students build a wooden desk organizer while learning timber joinery, veneering, plastic shaping, and safe workshop tool use. • Timbers: Choose suitable hardwoods, softwoods, or manufactured boards like MDF and plywood. • Wooden Joints: Mark out, cut, and fit simple joints such as housing, finger, or dowel joints. • Veneers: Glue and trim real wood veneers onto manufactured boards to cover raw edges and improve appearance. • Surface Finishes & Treatments: Sand the wood smooth and apply finishes like oil, wax, varnish, or paint. • Polymers: Cut and shape plastic parts, such as clear acrylic dividers or handles. • Hand Tools: Safely use tenon saws, chisels, try squares, and planes to mark out and shape timber. • Machine Tools: Safely operate workshop machinery, including pillar drills, sanders, and scroll saws.	Disassemble Project Students take apart an existing product to see how it was made, then use CAD/CAM and workshop tools to redesign and rebuild their own version. • Timbers: Identify different wood types and manufactured boards, choosing suitable materials to rebuild components. • Hand Tools: Use measuring tools, screwdrivers, and saws to dismantle products and shape new parts. • Fabrication: Practice joining, fixing, and finishing techniques to assemble the new product securely. • Production Methods: Compare how the original product was factory-made (mass/batch production) with school workshop making (one-off). • Stock Form: Learn standard timber sizes and board thicknesses to plan raw material use efficiently. • CAD: Draw accurate 2D vector plans or 3D models of product components on design software. • CAM: Use digital tools like laser cutters or CNC routers to manufacture accurate parts from CAD files.
Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4

KS4 DT Programme of Study (YEAR 11)

NEA (Non-Exam Assessment)

Autumn 1:	Autumn 2	Spring1	Spring 2	Summer 1
Section A: Investigate (16 Marks) Students research their chosen context, work with a real client, and set out clear project goals in a design brief and specification. • Investigating Design Possibilities: Research the context, look at existing products on the market, and identify real problems to solve. • User & Client Research: Speak to a user or client to find out what they actually need, like, and expect from the product. • Design Brief: Write a short statement outlining what will be made, who it is for, and why it is needed. • Design Specification: Write a list of measurable rules for the design, covering size, materials, safety, aesthetics, and cost.	Section B: Design (42 Marks) Students sketch initial ideas, gather client feedback, and refine a final design using sketches, CAD models, and detailed notes. • Initial Ideas: Sketch a range of creative design ideas to explore different shapes, styles, and solutions. • Reviewing Ideas: Check initial designs against the specification and ask the client for feedback to pick the best option. • Design Development: Improve the chosen design by working out exact dimensions, materials, and construction methods. • Final Review: Check the finished design plan against client requirements before starting to build. • Communicating Ideas: Present the final design clearly using 2D/3D CAD, hand drawings, and explanatory notes.	Section C: Make (36 Marks) Students select materials and build their final working prototype, focusing on tool skills, accurate construction, and a clean finish. • Selecting Materials & Components: Choose suitable materials, fixings, and hardware for each part of the build. • Manufacturing Skills: Use hand tools, machines, and CAM tools safely to cut, shape, join, and assemble the prototype. • Quality & Accuracy: Work to precise measurements, test fits, and finish surfaces neatly.	Section D: Evaluate (6 Marks) Students test their prototype against specification targets, gather client feedback, and review performance, improvements, and environmental impact. • Testing & Technical Criteria: Test the prototype against measurable specification targets like size, weight, and function. • User Feedback: Get the client to test the product and provide direct feedback on how well it works. • Evaluating Performance: Identify success points and flaws, explaining practical changes needed for a commercial version. • Life Cycle Assessment: Assess the environmental impact from raw material sourcing through to disposal or recycling.	Written Exam Theory Topics Students revise key technical theory, material properties, and design principles in preparation for the written exam. • Environmental, Social & Economic Issues: Sustainability, eco-design, fair trade, and manufacturing impact. • Work of Others: Analyze existing products, past designers, and design movements. • New & Emerging Technologies: Industry automation, tech developments, and evaluating their impact on design. • Design Strategies: Iterative design, user-centered design, systems thinking, and collaboration. • Communicating & Justifying Ideas: Record and explain designs using 2D/3D drawings, annotations, and notes. • Modern & Smart Materials: Properties and practical uses of modern composites and responsive materials. • Mechanical Devices: Mechanisms, linkages, gear ratios, and types of motion. • Materials (Woods, Metals, Polymers, Papers & Boards): Categories, stock forms, physical properties, and uses. • Flow Charts: Draw and read system diagrams and production flow charts. • Testing & Evaluation: Test product performance, gather user feedback, and evaluate designs against specifications.
Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4	Assessment: AO1/AO2/AO3/AO4	

GCSE

What's assessed

This qualification is linear. Linear means that students will sit all their exams and submit all their non-exam assessments at the end of the course.

- Component 1, Written Examination Core technical principles, designing and making principles, and one chosen specialist material category (Timbers, Metals, Polymers, Systems, Textiles, or Papers & Boards). The paper includes applied mathematics and scientific principles related to design and technology.

How it's assessed

- Written exam: 1 hour 45 minutes.
- 100 marks.
- 50% of GCSE.
- Set and marked externally by Pearson Edexcel.
- Component 2, Non-Examined Assessment (NEA) A sustained design-and-make project responding to a contextual challenge set by Pearson Edexcel. Students investigate user needs, generate and refine design concepts, manufacture a functional working prototype, and evaluate the final outcome.

How it's assessed

- Practical working prototype and supporting design portfolio.
- 100 marks.
- 50% of GCSE.
- Non-exam assessment (NEA) set by Pearson Edexcel; marked by the school/college and moderated by Pearson Edexcel.

Learning Resources:

- <https://www.bbc.co.uk/bitesize/examspecs/zb6h92p>
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- https://qualifications.pearson.com/content/dam/pdf/GCSE/design-and-technology/2017/specification-and-sample-assessments/Pearson_Edexcel_GCSE_9_to_1_in_Design_and_Technology_Specification_issue3.pdf