

Design Technology

KS3

Year 7		Year 8		Year 9	
HT1: 	HT2: Planning, marking out and measuring: In a 12-lesson unit which links closely with the KS2 expectation, pupils learn about patterns and templates, analyse fabrics, and consider the difference between natural and manufactured fabrics. Pupils also learn about basic wasting and addition processes. Design and make activity: Fabric door stop	HT1: Timbers – natural and man-made: Over 7 lessons pupils learn about traditional joining methods (e.g. mitre), and to 'jigs' as a means of marking out. Interleaved with this, pupils also develop an understanding of different types of natural timber and how to select based on their physical properties. Design and make activity: Hand held maze game	HT2: Timber Assembly Methods, Mechanical Components: Over 7 lessons, pupils learn about timber as a material, and about manufactured woods & different assembly methods required. Learning about the client links back to the design process. Mechanical components are introduced: cams, levers, pulleys, & gears. Design and make activity: Mechanical moving toy	HT1: Scales of production, plastics & complex design: This unit interleaves Year 8 HT 4 on scales of production, increasing depth and detail, and revisits learning on plastics, dovetailing with Year 8 projects and Year 7 vacuum forming. Pupils use 2D Design to develop a complex design covering ACCESSFM. Design and make activity: USB Drive	HT2: Design Technology in our World: Pupils cover design technology in our world: human factors, sustainability, ethical design & responsibility of manufacturers. Learning about product lifecycles ties the plastic study together. Pupils find solutions to a design brief, honing CAM skills. Design and make activity: USB Project
HT 3: Introduction to the design process – the design brief and specification: Across 12–14 lessons, pupils learn about the design process, informing initial design idea generation. Pupils also learn more about materials, exploring plastics and the process of vacuum forming, as well as the functions of packaging. Design and make activity: Cast Chocolate Mould	HT 4: Smart and modern materials: Pupils develop skills in recognising and separating 21 st Century materials, including thermochromic, photochromic, hydro chromic, polymorph, shape memory alloys, microencapsulation and smart fibres. This learning interleaves with further study of fabrics over the course of 10 lessons. Design and make activity: Iterative Smart Samples	HT 3: Metals, Mechanical & Electronic Components: These 8 lessons introduce metals as a new material area and interleave systems by tying the mechanical components structure of input process output with an electronic system. Pupils are also introduced to electronic components as a key area. Design and make activity: Electronic steady hand game	HT 4: 2D & 3D Development: Revisiting of 2D design learning from Year 7 is interleaved with CAD/CAM across 6 lessons to create a platform for pupils to learn about 3D development software through Fusion 360 and Cura. Pupils are introduced to scales of production through the collaborative design task. Design and make activity: Collaborative pet products	HT 3: Iterative Design, Casting: Pupils revisit the iterative design process. Metal as a material is taught in more depth and mastered, including types, categories, properties and finishes. Pupils are introduced to casting as new process, similar to the moulding and forming studied in Years 7 & 8 respectively. Design and make activity: Pewter Casted jewellery	HT 4: Iterative Design, Casting, Rapid Prototyping: Pupils refine their final design in accordance with the constraints of the process. Pupils consider their work in an industrial context, linking with scales of production, responsibilities of designers and concepts like automation. Rapid prototyping is mastered. Design and make activity: Pewter casted jewellery
HT 5: CAD and CAM: In a unit of 12 lessons, pupils are introduced to CAD & CAM and supported in developing an understanding of types and differences between the two. 2D Design navigation is used to teach pupils introductory CAD skills and a laser cutter driving licence promotes further understanding of how CAD and CAM merge. Design and make activity: Plywood Mobile Phone	HT 6: Physical properties of materials: Pupils explore physical properties, working primarily with paper and board but interleaving with fabrics, plastics and woods. Within the 12 lessons, iterative design is also explored, including modelling & prototyping, testing & evaluating. Collaborative design and make is introduced alongside the iterative process: Bridges and Towers.	HT 5: Structures, engineering & architecture: This 6-lesson unit interleaves pupils' learning on structural development (Towers & Bridges) with exploration of the influence of social and ecological factors on engineering choices. Pupils also make connections between local, national and international architecture, which links to careers education. Design and make activity: Physical architectural model	HT 6: Modelling, CAD & Biodegradability: Pupils develop a model using Fusion 360 and revisit learning on CAD covered throughout KS3, laying foundations for the exploration of rapid prototyping in Year 9 and at KS4. Further work on plastics is interleaved, and the concepts of biodegradability and choice are also included in this unit of 7 lessons. Design and make activity: Architectural model	HT 5: Natural & manufactured woods: Pupils master woods, both natural and manufactured, and develop both an understanding of and an ability to construct traditional wooden joints. Understanding of wasting processes with regard to woods is mastered. Design and make activity: Traditional wooden joints	HT 6: Traditional Manufacture vs Automation, Assembly: Pupils revisit and master CAD/CAM whilst considering automation versus the traditional approach. Pupils also develop an understanding of assembly: finish, quality control and quality assurance. Design and make activity: Traditional wooden joints

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KS4 – Design Technology GCSE

Year 10		Year 11	
HT1: Materials, Iterative Design, Modelling & Testing: Pupils begin to master iterative design over the linear approach. The medium for this is through a range of modelling and testing. Pupils explore materials and their physical properties and complete design and make challenges through prototyping in a range of matter.	HT2: Mechanical Components & Systems: Pupils master mechanical components & systems and become confident in naming, rationalising and applying formulae for a range of mechanisms. Pupils expand their repertoire of design and making, consider different target markets and understand the role of the design specification more deeply. Design & Make Task: Moving Vehicles	HT1: Non-examination Assessment: Investigation through collaborative design: Pupils consider primary versus secondary sources of research and the role of the client profile. Working independently, pupils develop their own project by proving the problem within a context and writing their own specification and brief.	HT2: Non-examination Assessment: Investigation through collaborative design: Returning to the iterative process, pupils now apply their understanding through the constraints of the NEA. Pupils develop a solution to their problem by developing their design ideas and constructing models & prototypes, until a viable submission is determined.
HT 3: The Design Process: Pupils explore the world of design and make in the 21 st century and consider scales of production, becoming more astute in their application and understanding of CAD/CAM. Under the focus of the design process, pupils begin to consider the investigation phase and communication techniques Design & Make Task: Festive Products	HT 4: Electronic Systems: Pupils revisit and master electronic systems; applying an understanding of inputs, processes and outputs, types of systems and the language of systems. Pupils are introduced to micro-controllers and micro-processors. Design & Make Task: Lighting	HT 3: Manufacturing a functional prototype: Pupils manufacture a functional prototype, within the demands of their specification, applying traditional and CAD / CAM skills. Pupils demonstrate planning and the creation of working drawings, both isometric and orthographic, and use communication skills to present a viable working solution.	HT 4: Assembling the Prototype: Pupils finish and assemble their prototype. Pupils evaluate the success of the final prototype using the design specification and through rigorous testing, suggesting modifications to further apply the iterative process and demonstrate an understanding of where the project aligns with industry.
HT 5: Design Technology in our World: Pupils advance through the topic of DT in our world and 21 st century design with a focus on their responsibilities as designers. Previous projects are interleaved to help pupils reflect on their sociological decisions. Pupils will also cover sustainability and eco-design.	HT 6: Smart, modern and interactive materials: Advancing through 21 st century design, pupils consider smart, modern and interactive materials and their role within design; linked to the previous half term. Pupils begin to consider how the choices, materials and technology they have available to them now and in the future can be best applied.	HT 5: Technical Principles & Exam Preparation: Pupils consider and revisit the full range of section A and the technical principles in preparation for the external examination. This will include: Design Technology in Our World, Smart Materials and Mechanical Components.	HT 6: Technical Principles & Exam Preparation: Pupils consider and revisit the full range of section A and the technical principles in preparation for the external examination. This will include: Electronics and Materials. Pupils will develop further their chosen specialism in the core principles of DT.

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KS4 – Graphics NCFE Technical Award

Year 10		Year 11	
HT1: Introduction to Graphic Design: Pupils complete an introduction to Graphic Design, which introduces pupils to the 6 components of graphic design. Pupils explore their understanding of career progression and relationships between technical awards and GCSE.	HT2: Unit 1: Pupils apply their understanding of the key principles by designing the marketing for a movie poster. Pupils experiment with colour and tone, printmaking, collage as well as imagery exploration and compositional study	HT1: Unit 2: Pupils explore the work of past and present designers, developing a greater understanding of the graphic design industries and what it is like to work in graphic design. Job roles, career progression and post 16 opportunities link to PSHE & careers education.	HT2: Graphic Designers & Design Briefs: Pupils apply the work of a chosen graphic designer to book illustration / decoration. Pupils carefully emulate the skills, styles and approaches of a professional to create an original response to a brief. Pupils evaluate and analyse a designer and the pupils' application of the designer's work.
HT 3: Unit 1: Pupils are introduced to advanced software through Adobe Photoshop (introduction and basics of navigation). Pupils develop a final design idea by creating a final design in Photoshop; applying with confidence all of the key components of graphic design. Pupils evaluate their graphic design and the key skills applied.	HT 4: Unit 4: Pupils develop a broader understanding of the skills and variations of graphic design and compile a portfolio. This will include the production of a photography diary, understanding typography, collage and montage, the role of design briefs and the work of others.	HT 3: Unit 3: Pupils continue their career focus and meet professionals from a range of industries to inspire their work. Pupils work with a real design problem to generate a design brief, considering the full plethora of graphic design and the needs of society when composing their problem.	HT 4: Unit 3 Through execution of a range of graphic design skills, both traditional and CAD, pupils solve their original design brief. Pupils are required to weave together the coverage of all 3 previous units to develop an innovative solution that may touch on the work of others; but will not endeavour to mimic it.
HT 5: Unit 4 & Examined Unit Preparation: Pupils begin their examined unit preparation by developing an understanding of the mark scheme and conditions. Pupils will continue to supplement unit 4, but, through a range of tightly examined tasks and design briefs, will also address key skills and knowledge attained over the course of Year 10 in preparation for the examination.	HT 6: Examined Unit & Portfolio Work: Pupils begin live exam preparation and ultimately complete the 10-hour assessment. Pupils then review the examination upon receipt of the results and devise an action plan for Year 11. Pupils continue to develop and complete their graphic design portfolio through a range of experiments in colour, tone, image, typography and composition.	HT 5: Unit 4 & Examined Unit Preparation: Pupils begin their examined unit preparation by developing an understanding of the mark scheme and conditions. Pupils continue to supplement Unit 4, by compiling their portfolio, selecting and discarding work to generate the optimum presentation for the moderator.	HT 6: Unit 4 & Examined Unit Preparation: Pupils begin live exam preparation and ultimately complete the 10 hour assessment. Pupils complete the course upon submission of the final unit (Unit 4 portfolio) and the completion of any resit / first attempt of the examination. Pupils take ownership of the learning in this half term, based on their independent portfolio selections.

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