The Hart School – Faculty of Design
Yr 7 Design and Technology Curriculum Overview

Curriculum intent: Design and Technology at The Hart School teaches every pupil to design and make products that solve real problems for real people. The curriculum delivers the Key Stage 3 National Curriculum for design and technology: designing (research, specifications and creative ideas), making (selecting and using tools, materials and processes safely and accurately), evaluating (testing and improving products and learning from designers) and technical knowledge (materials, structures, mechanisms, electronic systems and programming). Cooking and nutrition is taught in Food Preparation and Nutrition.

Pupils have one Design lesson a fortnight, about 15 lessons a year. Each year returns to the same strands at greater depth: designing, communicating, materials, making, systems and mechanisms, structures and forces, and evaluating. Year 7 builds workshop safety, drawing and accurate making in timber and polymers; Year 8 adds mechanisms, electronics and CAD/CAM; Year 9 works like a KS4 candidate, with technical drawing, 3D CAD, product analysis and the full iterative design process. Every lesson opens with retrieval, and work is judged against one ladder from Bronze (identify) to Diamond (evaluate and justify).

Practical work is risk-assessed and taught in small, demonstrated steps, with machine sign-off before independent use. Tasks are scaffolded for pupils with SEND through templates, visual instructions and adapted tools, and Pupil Premium and SEND work is live-marked and analysed first. The curriculum prepares pupils for both Key Stage 4 pathways: AQA GCSE Design and Technology and the OCR Cambridge National in Engineering Design.

Yr 7 end points: By the end of Year 7 pupils can work safely in the workshop; sketch in 2D and isometric; analyse a product and write a specification; identify timbers and polymers and describe their properties; measure, mark out, cut, join and finish materials to ±1 mm; explain and build a simple circuit; and test and evaluate their work against a specification and with a user.

Yr 7 key dates (LTP): Baseline in L1 · summative assessments at L8 and L14 · AP1 data capture from the L8 summative assessment, data drop deadline 23.3.27 · Year 7 reports home 14.4.27 · AP2 window w/c 7.6.27 to 28.6.27 · reports home 14.7.27

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Core Course Topic: Lesson (L) numbers; Design is taught once a fortnight. Bold = summative assessment.	**Workshop Safety and Design Communication** L1 · Workshop safety rules and baseline L2 · Sketching: 2D, isometric and rendering L3 · Design briefs, user needs and specifications	**Materials: Timbers; Measuring and Marking Out** L4 · Timbers: hardwoods, softwoods, manufactured boards L5 · Generating ideas and card modelling L6 · Marking out, cutting and joining safely	**Making Skills: Shaping, Finishing and Evaluating** L7 · Shaping, drilling and assembly **L8 · Finishing, testing and evaluation**	**Materials: Polymers; Electronics: Simple Circuits** L9 · Polymers: thermoplastics and thermosets L10 · Circuits: components, symbols and polarity L11 · Designing with 2D drawings and templates	**Making Skills: Polymers, CAD/CAM and Circuits** L12 · Cutting, shaping and bending acrylic L13 · Assembling and testing circuits **L14 · Testing and evaluation**	**Designers, Cultures and Year 8 Bridge** L15 · Designers and cultures; end-of-year review
Additional support links: Topic-specific pages from trusted sources (links checked September 2026)	**STEM Learning** Design and technology resources **IET Education** Ergonomics and design (KS3)	**Technology Student** Wood-based materials **FSC UK** What is FSC? **Seneca (GCSE preview)** Timbers	**STEM Learning** Design and technology resources **Technology Student** Wood-based materials	**Technology Student** Thermoplastics revision cards **Seneca (GCSE preview)** Polymers **Tinkercad** Learn circuits and 3D design	**Technology Student** CNC and CAM **Tinkercad** Learn circuits and 3D design	**Design Museum** Designers and collections **Design Museum** Yinka Ilori: Parables for Happiness **National Careers Service** Product designer
Knowledge: The specific knowledge your child will learn in detail	Workshop rules keep everyone safe: bags away, apron on, hair tied back, goggles when cutting or drilling, and tools used only after a demonstration. A hazard is something that could cause harm; a risk assessment sets out how to control it. Designers communicate ideas through sketches: 2D views, isometric drawing (vertical lines, with the others at 30°) and rendering with tone to show form. A design brief states the problem and the user; ACCESS FM (aesthetics, cost, customer, environment, size, safety, function, materials) helps analyse a product and write a specification.	Hardwoods (oak, beech) come from broadleaf trees and are dense and durable; softwoods (pine) come from conifers, grow faster and are cheaper; manufactured boards (MDF, plywood) are made from wood fibres or layers and come in large, stable sheets. FSC certification shows timber comes from responsibly managed forests. Accurate making starts with measuring and marking out with a try square and pencil, then cutting on the waste side of the line. Simple joints (butt, lap, dowel) and PVA glue join timber. Card models test size and proportion before making.	Shaping uses files, rasps and abrasive paper, working from coarse to fine grades. A pillar drill is used only with the work clamped and the guard down. Assembly is checked for square before the glue dries. Finishes (paint, varnish, oil) protect timber and improve its appearance. An evaluation tests a product against each specification point and with the user, then suggests improvements.	Thermoplastics (acrylic, HIPS) soften when heated and can be reshaped and recycled; thermosetting polymers (melamine, epoxy resin) set permanently. Acrylic is rigid, glossy and cuts cleanly. A circuit needs a power source, a switch and an output. An LED lets current flow one way only, so it must be fitted the right way round (long leg to positive), and a resistor protects it from too much current. Circuit diagrams use standard symbols. Designs are drawn as accurate 2D templates for cutting.	Acrylic is cut with a coping saw or a laser cutter (teacher-run), smoothed with files and wet-and-dry paper, and bent on a line bender wearing heat-resistant gloves. CAD/CAM (computer-aided design and manufacture) makes accurate, repeatable parts. Circuits are assembled with connectors, checked for polarity and tested before final assembly. Evaluation tests work with a user and against the specification.	Designers shape the products we use and draw on their own cultures and experiences: Yinka Ilori's colourful furniture and spaces draw on his British-Nigerian heritage, while Dieter Rams' principles of good design ask for products that are useful, honest and long-lasting. Reviewing the year shows which strands are secure and sets targets for Year 8. Careers: product designer, engineer, technician.
Key vocabulary: Subject terms your child should know, spell and use	*hazard, risk assessment, PPE, isometric, rendering, design brief, user, specification, ACCESS FM, ergonomics*	*hardwood, softwood, manufactured board, MDF, plywood, FSC, sustainability, try square, tenon saw, bench hook, joint, PVA*	*file, abrasive paper, pillar drill, clamp, assembly, square, finish, varnish, evaluation*	*thermoplastic, thermoset, acrylic, recycle, circuit, LED, resistor, polarity, switch, circuit symbol, template*	*coping saw, line bender, CAD, CAM, laser cutter, connector, polarity, test, evaluation*	*designer, culture, influence, principles of good design, career, review, target*
Practical Skills: The design and making skills your child will learn and practise	Following workshop routines; isometric sketching; adding tone and colour; analysing a product with ACCESS FM; writing simple specification points	Measuring and marking out; sawing on the waste side with a tenon saw and bench hook; making a simple joint; card modelling; working to ±1 mm	Shaping and smoothing; safe drilling; assembling square; applying a finish; testing against the specification	Identifying polymers; reading and drawing circuit symbols; building and testing a circuit (simulated first); drawing a 2D template	Cutting and finishing acrylic; using a line bender safely; assembling a working circuit; testing and evaluating	Analysing a designer's work; reflecting on progress; setting targets
How it is assessed: Formative checks and summative assessments	Baseline (L1) maps starting points in drawing, knowledge and making. Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first. Safety rules quiz; exit tickets on isometric drawing and ACCESS FM.	Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first. Timber identification exit ticket (L4); ideas reviewed against the specification (L5); live feedback at the bench (L6).	L8: summative assessment of making and evaluating against the ladders (practical work photographed), QLA by cohort; DIRT follows.	Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first. Polymer exit ticket; circuit simulation working. AP1 data capture: the L8 summative grade is recorded as the Year 7 AP1 (data drop deadline 23.3.27); no separate test is sat.	Live feedback at the bench. L14: summative assessment of designing, making and evaluating against the ladders, QLA; DIRT follows. Year 7 reports home 14.4.27.	AP2 window w/c 7.6.27 to 28.6.27: end-of-year knowledge assessment and summative grades recorded at AP2; QLA by strand and cohort, PP and SEND first. Reports home 14.7.27.
Builds on / leads to: How this topic connects to prior and future learning	Builds on: KS2 design and technology. Leads to: materials and making (Autumn 2); Y8 designing for users; KS4 design requirements (AQA NEA, OCR R038).	Builds on: Autumn 1 drawing and specifications. Leads to: shaping and finishing (Spring 1); Y8 joining and structures; GCSE timbers.	Builds on: Autumn 2 materials and marking out. Leads to: polymers and electronics (Spring 2); KS4 practical skills.	Builds on: Year 7 materials and making. Leads to: working with polymers and CAD/CAM (Summer 1); Y8 electronic systems; GCSE systems.	Builds on: Spring 2 polymers and circuits. Leads to: Y8 CAD/CAM; GCSE polymers and systems.	Builds on: all Year 7 learning. Leads to: Year 8 mechanisms.

AP1 Data Capture deadline 23.3.27

AP2 Assessment w/c 7.6.27 to 28.6.27

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Design and Technology: Curriculum Map and KS4 Pathways

Each strand is taught in every year and revisited at greater depth, so pupils build on what they already know. Year 9 follows the same design process as both Key Stage 4 courses, so pupils are ready for either pathway.

Strand	Year 7	Year 8	Year 9	GCSE D&T (AQA 8552)	Engineering Design (OCR J822)
Designing	Design brief, user needs, ACCESS FM, specification	Designing for a target user; briefs from product analysis	Client research, measurable specification, design strategies, biomimicry	NEA investigation, brief, specification and ideas	R038 designing processes and design requirements
Communicating	2D and isometric sketching, rendering, templates	2D CAD; flowcharts; block diagrams	Third-angle orthographic to BS 8888; 3D CAD; annotation	Sketches, exploded views, CAD and models	R039 freehand sketches, engineering drawings and CAD
Materials	Timbers, manufactured boards, polymers; FSC	Smart and modern materials	Material choice for function, cost and sustainability	Core and specialist materials and their properties	Material properties in design requirements
Making	Marking out, sawing, joining, finishing to ±1 mm; acrylic	Mechanisms; CAM laser cutting	Making to tolerance; quality control	NEA prototype with quality control	R040 virtual and physical modelling
Systems and mechanisms	LED circuits, polarity, resistors	Levers, linkages, cams; inputs, processes, outputs; microcontrollers	Systems within analysed products	Mechanical devices and electronic systems; ratio calculations	Systems in product analysis
Structures and forces	Stable, square assemblies	Rigid frames and triangulation	Forces in product analysis and prototypes	Forces, stresses, reinforcement and stiffening	Requirements and modelling
Evaluating and wider issues	Testing with a user; designers and cultures	Life cycle and circular economy; careers	Evidence-based evaluation; 6 Rs; responsibilities of designers	NEA analysis and evaluation; environmental, social and economic issues	R038 evaluating design ideas; R040 evaluation

Key Stage 4 courses at a glance

Course	Exam	Non-exam assessment
GCSE Design and Technology, AQA 8552	Written exam: 2 hours, 100 marks, 50% (core technical principles, specialist technical principles, designing and making principles; at least 15% mathematics and 10% science).	Non-exam assessment: about 30 to 35 hours, 100 marks, 50%; contextual challenges released by AQA on 1 June in the year before submission; marked in school and moderated by AQA.
Cambridge National in Engineering Design, OCR J822	R038 Principles of engineering design: exam, 1 hour 15 minutes, 70 marks, 40%.	R039 Communicating designs (30%) and R040 Design, evaluation and modelling (30%): OCR-set assignments, marked in school and moderated by OCR.

The Hart School – Faculty of Design
Design and Technology: National Curriculum Coverage

National Curriculum coverage: every Key Stage 3 statement (lesson numbers)

Area	Key Stage 3 National Curriculum statement	Year 7	Year 8	Year 9
Design	use research and exploration, such as the study of different cultures, to identify and understand user needs	L3, L15	L4, L9	L7
Design	identify and solve their own design problems and understand how to reformulate problems given to them	L3, L5	L4	L7–L8
Design	develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	L3	L9	L8
Design	use a variety of approaches [for example, biomimicry and user-centred design] to generate creative ideas and avoid stereotypical responses	L5	L4	L8
Design	develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations	L2, L5, L11	L2, L10	L3–L5, L9
Make	select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture	L6–L8, L12	L5, L11–L12	L10–L11
Make	select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties	L4, L9	L13	L9–L11
Evaluate	analyse the work of past and present professionals and others to develop and broaden their understanding	L15	L9, L15	L2
Evaluate	investigate new and emerging technologies	L12	L11, L13	L4–L5
Evaluate	test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	L8, L14	L6, L14	L12–L14
Evaluate	understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	L4	L14, L15	L14
Technical	understand and use the properties of materials and the performance of structural elements to achieve functioning solutions	L4, L7, L9	L5, L13	L9
Technical	understand how more advanced mechanical systems used in their products enable changes in movement and force	—	L2–L6	L2
Technical	understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]	L10, L13	L7	L2
Technical	apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors] and control outputs [for example, actuators] using programmable components [for example, microcontrollers]	—	L7–L8	—

Statements quoted from the National Curriculum in England: design and technology programmes of study (DfE). Cooking and nutrition is delivered in Food Preparation and Nutrition.