The Hart School – Faculty of Design
Yr 9 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 9 end points: By the end of Year 9 pupils can analyse and disassemble a product; draw in third-angle orthographic projection to BS 8888; model parts and assemblies in 3D CAD; follow an iterative design process from research to a tested prototype; and evaluate using evidence and the 6 Rs, ready for either KS4 pathway.

Yr 9 key dates (LTP): Baseline in L1 · summative assessments at L6 and L14 · Year 9 assessment week w/c 18.1.27 and 25.1.27 · AP2 window w/c 7.6.27 to 28.6.27 (KS3 exit assessment and options guidance) · 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.	**Engineering Design: Product Analysis and Technical Drawing** L1 · Risk assessment and baseline L2 · Product analysis and disassembly L3 · Third-angle orthographic drawing	**Engineering Design: 3D CAD and Modelling** L4 · 3D CAD: sketch, extrude and assemble L5 · Modelling: virtual, physical and mathematical **L6 · Engineering drawing and CAD assessment**	**Iterative Design: Research, Specification and Ideas** L7 · Context, users and research methods L8 · Specifications and design strategies	**Iterative Design: Development, Prototyping and Production** L9 · Developing ideas through modelling L10 · Prototyping: materials and processes L11 · Scales of production and quality control	**Iterative Design: Testing, Evaluation and Sustainability** L12 · Testing against the specification and with users L13 · Using evidence to improve a design **L14 · Evaluation and the 6 Rs**	**KS4 Pathways and Year 9 Review** L15 · KS4 pathways and end-of-year review
Additional support links: Topic-specific pages from trusted sources (links checked September 2026)	**Technology Student** Third-angle orthographic drawing **STEM Learning** Design and technology resources	**Onshape** Free CAD for education **Technology Student** CNC and CAM	**Seneca (GCSE preview)** Market research and clients **Seneca (GCSE preview)** Design strategies **Biomimicry Institute** Whales and wind turbine blades	**Seneca (GCSE preview)** Production techniques and systems **STEM Learning** Design and technology resources	**Seneca (GCSE preview)** Sustainability and LCA **Ellen MacArthur Foundation** The circular economy	**AQA** GCSE Design and Technology 8552 at a glance **OCR** Engineering Design J822 at a glance
Knowledge: The specific knowledge your child will learn in detail	Engineers analyse existing products by taking them apart safely and identifying components, materials, joining methods and how they were manufactured. Third-angle orthographic projection shows a product in three views (front, plan and end) laid out to BS 8888, with dimensions in millimetres, standard line types (outline, hidden detail, centre lines) and a title block. Pupils write their own risk assessments, identifying hazards and control measures.	3D CAD builds parts from dimensioned sketches using extrude, revolve and fillet, then joins them in an assembly. Virtual models test fit and appearance before anything is made; physical models (card, foam, 3D prints) test size, feel and function. Mathematical modelling, such as calculating sizes and costs, checks a design works. Engineers choose the modelling method that answers the question being tested.	Iterative design is a cycle of design, make, test and improve. It starts with a context and a user: research (interviews, surveys, product analysis, and the needs of users from different cultures and backgrounds) identifies needs, which become a measurable specification. Design strategies such as user-centred design, collaboration and biomimicry (learning from nature, such as the bumps on a humpback whale's fin) help generate creative ideas and avoid design fixation.	Development refines the best idea through modelling and testing, recording each change and why. A prototype is a working model used to test a design with the user. Materials and processes are chosen for function, cost, sustainability and the scale of production (one-off, batch or mass). Quality control checks accuracy during making, using jigs, templates and tolerances.	Testing gathers evidence from users and against each specification point; improvements are made and retested. Evaluation judges a design using evidence and considers social, moral and environmental issues: the 6 Rs (reduce, reuse, recycle, repair, rethink, refuse), a product's life cycle and the circular economy, and the responsibilities of designers and engineers.	Two Key Stage 4 pathways build on KS3. AQA GCSE Design and Technology (8552) is 50% written exam and 50% non-exam assessment, a substantial design and make task. The OCR Cambridge National in Engineering Design (J822) is 40% exam (R038) and 60% non-exam assessment across R039 Communicating designs and R040 Design, evaluation and modelling.
Key vocabulary: Subject terms your child should know, spell and use	*risk assessment, disassembly, component, manufacture, orthographic, third angle, BS 8888, dimension, hidden detail, title block*	*3D CAD, sketch, extrude, revolve, fillet, assembly, virtual model, physical model, mathematical modelling, 3D printing*	*iterative design, context, user, client, primary research, secondary research, specification, user-centred design, biomimicry, design fixation*	*development, iteration, prototype, scale of production, one-off, batch, mass, quality control, tolerance, jig*	*test, evidence, improvement, evaluation, 6 Rs, life cycle, circular economy, social and moral issues*	*GCSE, Cambridge National, non-exam assessment, exam, pathway, option*
Practical Skills: The design and making skills your child will learn and practise	Writing a risk assessment; disassembling and analysing a product; drawing in third-angle projection with dimensions	Modelling parts and assemblies in 3D CAD; physical modelling; producing an engineering drawing from CAD	Interviewing a user; writing measurable specification points; generating and annotating a range of ideas	Recording design development; choosing materials and processes; making to tolerance; quality checks	Planning and carrying out tests; using evidence to improve a design; writing an evaluation	Reflecting on strengths; choosing a pathway; setting targets
How it is assessed: Formative checks and summative assessments	Baseline across the strands. Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first. Orthographic drawing checked against BS 8888 conventions.	L6: summative assessment of the engineering drawing and CAD model against the ladder, QLA; DIRT follows.	Year 9 assessment week (w/c 18.1.27 and 25.1.27): knowledge assessment across Years 7 to 9, QLA. Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first.	Live marking against the ladder, Bronze (identify) to Diamond (evaluate and justify); PP and SEND pupils checked first. Live feedback at the bench; development pages checked.	L14: summative assessment of designing, making and evaluating against the ladders, QLA; DIRT follows.	AP2 window w/c 7.6.27 to 28.6.27: KS3 exit assessment and summative grades recorded at AP2, QLA by strand and cohort; options guidance. Reports home 14.7.27.
Builds on / leads to: How this topic connects to prior and future learning	Builds on: Y7 and Y8 sketching and analysis. Leads to: 3D CAD (Autumn 2); OCR R039 and R040; AQA communication of design ideas.	Builds on: Y8 2D CAD. Leads to: OCR R039 and R040; AQA designing and making principles.	Builds on: Y7 and Y8 briefs and specifications. Leads to: development and prototyping (Spring 2); AQA NEA investigation; OCR R038 design requirements.	Builds on: Spring 1 ideas. Leads to: testing and evaluation (Summer 1); AQA NEA development; OCR R040 modelling.	Builds on: prototyping. Leads to: AQA NEA analysis and evaluation; OCR R038 evaluating design ideas.	Builds on: all KS3 Design. Leads to: AQA GCSE Design and Technology or OCR Engineering Design.

Year 9 Assessment Week w/c 18.1.27 and 25.1.27

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.