

All Hallows RC High School

Specialising in Business, Enterprise & Sports



DESIGN AND TECHNOLOGY CURRICULUM OVERVIEW

September 2022



WE AIM FOR ALL HALLOWS RC
BUSINESS, ENTERPRISE AND SPORTS COLLEGE TO BE A
CATHOLIC SCHOOL
TO WHICH CHILDREN WISH TO COME
TO WHICH PARENTS WISH TO SEND THEIR CHILDREN
AND WHERE TEACHERS
WISH TO TEACH

OUR MISSION IS TO OFFER A
HIGH QUALITY
CATHOLIC EDUCATION
FOR ALL, IN AN ENVIRONMENT WHERE
GOSPEL VALUES ARE CENTRAL
TO TEACHING AND LEARNING
AND IN WHICH THE
UNIQUE VALUE
OF EACH PERSON IS
RECOGNISED AND RESPECTED



Curriculum Intent

Design Technology at All Hallows follows AQA Design Technology. This allows all students who choose to study at Year 11, another GCSE, along with the opportunity to study a subject which will allow them to participate confidently and successfully in an increasingly technological world.

The Importance of Design Technology

Design technology allows our students to learn how to become more resourceful, innovative, enterprising and capable. Our department aims to provide all students with the opportunity to investigate and examine a range of designs and products through visual aids and hands-on experience. As we progress through the curriculum our aim is to develop student awareness in taking a product from initial problem to a final solution. All Design Technology students will build upon:

- Solving 'real life' problems (Being Creative)
- Delivering what the client wants (Managing Information)
- Appreciating that 'quality' in everything is essential (Thinking Skills and Personal Capabilities)
- Decision making (Thinking, Problem-Solving and Decision-Making)
- Working to deadlines (Self-Management)
- Communication skills (Working with Others)
- Use of Information Communication Technology (ICT Accreditation Scheme)

Year 7 – 9 Department Structure

All students at All Hallows study Design Technology at Key Stage 3 (Years 7-9) before deciding on their option to pick DT as a GCSE option. At Key Stage 3 pupils get exposed to a wide range of manufacturing processes, tools and machinery. All students will have the opportunity to gain experience in CAD/ CAM techniques and the whole KS3 is designed in such a way that it is fun while laying the foundations of GCSE skills and knowledge.

The Technology suite is an excellent facility, enhanced by newly updated ICT and CAD CAM equipment.

Design and Technology is essentially a practical subject where the course is designed to enable students to acquire knowledge, understanding and skills which can be used in the design and manufacture of products which are meaningful to them.

During Year 7 pupils spend half the year in DT and the other half in Food Technology (Food Preparation and Nutrition) and this cycle repeats in Year 8. Over the two years pupils will cover an integrated Design Technology course which covers key aspects of:

- CAD/CAM: Computer Aided Design and Computer Aided Manufacture
- Resistant Materials: Designing and making with plastics, wood & metals
- Systems: Students consider Input, Process and Outputs mainly through their CAD/CAM Mechanisms and Electronics focused projects
- Graphic Products: designing and marketing for printed products such as packaging, mugs and t-shirts
- Electronic Products: exploring the use of electronics and sensors, movement, light and sound into functional technology products.

Year 10 - 11 GCSE Design Technology

Studying AQA GCSE Design Technology provides opportunities to tackle and resolve design and technological problems to meet human needs within a range of contexts, such as home, school, leisure, community, business and industry. Essentially, we are searching for better ways to do things, inventing solutions and taking risks.

Throughout this course, you will investigate historical, social, cultural, environmental and economic influences on design whilst enjoying opportunities to put your learning into practise. Students will produce prototypes of their own design using some of the latest technology available such as 3D CAD and 3D Printing.

You will gain a real understanding of what it means to be a designer. Areas to be covered will be the design cycle, plastics, metals, woods, smart and modern materials.

This creative and thought provoking qualification will develop your practical skills, theoretical knowledge and confidence to succeed in a number of careers. This course lends itself to careers based in Creative Industries and will also give a good grounding for continued study at University.

Students will sit a written 2 hour exam worth 100 marks, which makes 50% of the final GCSE grade. The other 50% coming from a physical prototype worth 100 marks. Each student will use a range of manufacturing techniques and processes to create a design based on a given context. Previous coursework examples have been designing a product which could aid a disabled client, or design a product that could be used for storage.

The GCSE coursework tasks will be provided towards the end of year 10 to enable students to begin to research their chosen task. Coursework should take approximately 35 hours and students undertake a design and make assignment for the chosen task. They are required to produce a folder of evidence for research, design development, and planning, alongside a made product to fit their design brief. The remainder of Year 11 is then spent on examination preparation and revision.

See link below for further information on GCSE AQA Design Technology

<https://www.aqa.org.uk/subjects/design-and-technology>

Career opportunities

Structural Engineering
Naval Engineering
Electronic Engineer
Architecture
Electrician
Graphic Designer
Fashion Design
Interior Designer
Games Design
Plumbing
Welding

KS4 Order of Teaching 2021/2022

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 Focus on formal elements	Project 1: Fretsaw Jigsaw	Project 2: Pencil holder Project	Project 3: Computer aided design and Computer aided Manufacture (CAD/ CAM)	Project 4: Ugly Doll Project: Textiles	Project 5: TinkerCAD: Online CAD modelling	Project 6: Egg Drop
Artists and craft people will be investigated throughout the years 7 to 9 to explore the history and diverse nature of careers in art and design.	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Health and safety in the workshop 2. Using a template to follow when cutting a design 3. Finishing techniques to smooth surfaces <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Learn health and safety in the workshop 2. Create a small Jigsaw hand crafted using Coping Saws 3. Correct use of the file/ vice/ sandpaper 	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. How to write a plan before manufacture including a design brief and specification 2. Design work including orthographic engineering drawing and perspective drawing 3. How to measure accurately before manufacture 4. Use of the Tenon saw, Bench Hook, sanding and filing equipment 5. Evaluations which compare with original specification <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Manufacture a Pinewood wooden Pencil holder which is painted and finished to a high standard 	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. What CAD CAM is. What the positives and negatives are and the job prospects in 21st century of knowing this programme 2. How to use CAD CAM to design and then make a personalised Ruler <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Make their own personalised ruler using CAD CAM 	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. What textiles are the the different natural synthetic types 2. How to thread and knot a needle/ thread 3. How to stitch closed a doll design <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create a personalised 'ugly doll' using stitching and cotton wool to stuff 	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Using CAD to model a proposed project 2. How computer aided drawing can be used rather than paper and pencils to create a design 3. The positives of using CAD in design work <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create an online CAD model of a design idea 	<p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Structures and forces 2. Product testing methods used by companies (the drop test, strength tests etc.) <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create a structure or design that will protect an egg when dropped 2. Use design intuition and creativity to create their design

Year 8	Project 1: Fretsaw Jigsaw Project 2: Handmade Wooden Box	Project 3: Key Ring Torch Project 4: Handmade Wooden Ship	Project 5: Computer Aided Design Keyring Project 6: Heroes Box ReDesign	Project 7: Cross Stitching Textiles bookmark	Project 8: Upcycle Robot head	Project 9: Balloon Buggy
Developing prior learning of formal elements from year 7.	<p>Project 1: Fretsaw Jigsaw</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Health and safety in the workshop 2. Using a template to follow when cutting a design 3. Finishing techniques to smooth surfaces <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Learn health and safety in the workshop 2. Create a small Jigsaw hand crafted using Coping Saws 3. Correct use of the file/ vice/ sandpaper <p>Project 2: Handmade Wooden Box</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Researching design ideas and learning the theory behind natural and manufactured wood 2. Developing a chosen design idea 3. Using hand made wood working joints and techniques to create a small wooden storage box 4. Use painting and sanding to finish a design ready for summer use <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Follow the design process and manufacturing techniques to create a personal small storage box 	<p>Project 3: Key Ring Torch</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Simple electronic systems 2. Different electronic components including LED, batteries and circuit boards 3. Design planning and template use to follow when cutting 4. Packaging and advertising methods to promote or sell a product <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Design and manufacture a small key ring torch along with designing tier own logo and packaging as done by major retail companies <p>Project 4: Handmade Wooden Ship</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Following the design process to create a wooden ship 2. Learn about upcycling and the 6R's of sustainability 3. Learn advanced wood working techniques including chiselling 4. Learn more about creative freedom. Shape and style of project up to students own ideas. <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Use advanced wood working techniques to create a wooden ship from pine wood 	<p>Project 5: Computer Aided Design Keyring</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. What CAD CAM is. What the positives and negatives are and the job prospects in 21st century of knowing this programme 2. How to use CAD CAM to design and then make a personalised keyring from acrylic or wood <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Make their own personalised keyring using CAD CAM <p>Project 6: Heroes Box ReDesign</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Logo design what works and why companies use a logo 2. How to re design a logo or create a new logo 3. Learn how to create a net which can be folded into various shapes <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Re design the cadbury/ heroes logo inside a hand made card box. Ensure legal requirements are included such as ingredients, nutritional information, copyright etc. 	<p>Project 7: Cross Stitching Textiles bookmark</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. What textiles are the the different natural synthetic types 2. How to thread and knot a needle/ thread 3. How to stitch in a cross stitching style <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create a personalised book mark which will promote reading in All Hallows. 	<p>Project 8: Upcycle Robot head</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. The design process in creating a new project 2. Sustainability and upcycling of scrap materials to create something new. 3. New manufacturing techniques such as bolts and washers, wood burning and nail and hammer use. 4. Manufacturing techniques theory including Batch, Mass, Continuous etc. <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Manufacture a scrap wood upcycled wooden robot head which is painted and finished to a high standard 	<p>Project 9: Balloon Buggy</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Global goals (11 - sustainable transport and cities) 2. The difference designers can make 3. What are fossil fuels? How does current transport happen? 4. History of wind power Forces and motion Why the buggy eventually stops? Energy transfer 5. Evaluations <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. create a buggy which will run on a renewable energy source (wind power form balloon)

Year 9	Project 1: Fretsaw Jigsaw Project 9: Aluminium Dog Tags	Project 2: Block Bot	Project 3: Personal Ruler: 2D Design Computer Aided Design	Project 4: Marshmallow Tower Project Project 5: Egg Drop Project	Project 6: Spinning Top Project Project 7: Craft Rocket	Project 8: CAD CAM Clock
Developing	<p>Project 1: Fretsaw Jigsaw</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Health and safety in the workshop 2. Using a template to follow when cutting a design 3. Finishing techniques to smooth surfaces <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Learn health and safety in the workshop 2. Create a small Jigsaw hand crafted using Coping Saws 3. Correct use of the file/ vice/ sandpaper <p>Project 9: Aluminium Dog Tags</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Metals theory - ferrous, non ferrous and alloys 2. Safety procedures when working with metals 3. Materials layout planning 4. Using a finishing coating (spray can) <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Use metal manufacturing techniques to create a small personalised dog tag with letters or a name printed on using embossing 	<p>Project 2: Block Bot</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Following the step by step design process in creating a design and design specification 2. Using modelling techniques to create a prototype before manufacture 3. Advanced wood working techniques to shape and create the various parts within the project 4. Painting and sanding finishing techniques skills developed 5. Creating a step by step manufacturing guide <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create a personal Block Bot from natural wood tied together using rope to be used as an ornament or seasonal gift 	<p>Project 3: Personal Ruler: 2D Design Computer Aided Design</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. What CAD CAM is. What the positives and negatives are and the job prospects in 21st century of knowing this programme 2. How to use CAD CAM to design and then make a personalised Ruler from acrylic or wood <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Make their own personalised Ruler using CAD CAM 	<p>Project 4: Marshmallow Tower Project</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. develop an understanding of structures and construction 2. work as a group to build the tallest freestanding structure out of spaghetti and tape. The structure has to support the weight of the marshmallow. 3. Students can be encouraged to take an iterative approach to building their structure by assessing the structure at intervals and building upon it 4. Design Evaluations . <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. work as a group to build the tallest freestanding structure out of spaghetti and tape. The structure has to support the weight of the marshmallow. <p>Project 5: Egg Drop Project</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Structures and forces 2. Product testing methods used by companies (the drop test, strength tests etc.) <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Create a structure or design that will protect an egg when dropped 2. Use design intuition and creativity to create their design 	<p>Project 6: Spinning Top Project</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. History of the spinning top - past and present design 2. Polygons - maths - regular and irregular polygons 3. Properties of a variety of materials - metal, wood, plastic, metal, ceramic and glass 4. How to follow a step by step manufacturing guide 5. Theory on composites and manufactured wood <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Follow and manufacturing guide to create a composite spinning top <p>Project 7: Craft Rocket</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Engineering laws and aerodynamics in flying and driving 2. Use of templates to ensure an accurate end product 3. The importance of accuracy and locating centre points 4. Room for personalisation and extension through creating a handheld pull-string 'launcher' <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Follow the manufacturing guide to create a spinning top with handheld pull-string launcher 	<p>Project 8: CAD CAM Clock</p> <p>What pupils are to learn:</p> <ol style="list-style-type: none"> 1. Upcycle something from home e.g. a CD, Vinyl, old book? 2. Assembly of a battery powered clock mechanism 3. Sustainability - why its so important? <p>Biodegradable materials Fossil fuels Renewables</p> <p>What pupils will be able to do:</p> <ol style="list-style-type: none"> 1. Taking something from home (upcycling) or using the laser cutter (CAD/ CAM) to create a clock face

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	Project details	Project details	Project details	Project details	Project details	Project details
	<p>Name - Adjustable Mirror Outline - This project will give you a basic understanding of the main workshop skills involved in manipulating polymers, metals and woods. You will learn how to cut, bend and screw thread metals, laser cut polymers, shape and finish wood to create an accurate and usable product.</p> <p>Vocabulary - Precision, Consistent, Present, Confident, Extended, Safely, Uniformly, Hardwood, Softwood, Pine, Larch, Oak, Beech, Drill, Ferrous, Non Ferrous, Alloy, Mild Steel, Aluminium, Brass, Stainless Steel, Tolerance, Screw Thread, Tap, Die, countersink.</p>	<p>Name - Gameboy Puzzle Game Outline - This project will give you an introduction to polymers, how they can be shaped through vacuum forming and formed using the sander, drill and countersink. You will also develop a solid working understanding of 2D Design in order to create an orthographic drawing. Manual isometric sketching will be developed with the use of traditional drawing equipment.</p> <p>Vocabulary - Confidence, Present, Error, Independent, Manage, Develop, Technique, Vector image, Bitmapped image, Polymer, Thermoform, Thermoset, Vacuum Form, Acrylic, Orthographic, Dimension, Isometric.</p> <p>Name - 3D Sketching Outline - This project will develop your ability to sketch in 3D (isometric)</p> <p>Vocabulary - Apply, Sketch, Isometric, Crating, Rendering.</p>	<p>Name - Mechanical Modelling Outline - This project will allow you to develop problem solving skills whilst creating workable prototypes. Effective use of time will be needed to complete the set tasks.</p> <p>Vocabulary - Diameter, Linkage, Cam, Gear, Pulley,</p> <p>Name - Experimenter Boards Outline - This project will develop your analytical as well as problem solving skills whilst creating workable prototypes.</p> <p>Vocabulary - Prototype, Input, Output, Process, Microcontroller.</p> <p>Name - Fab-Ric! Outline - This project will investigate the properties of textiles.</p> <p>Vocabulary - Investigate, Origin, Natural, Synthetic, Woven, Non Woven, Blended.</p> <p>Name - Key Designers Outline - This project will analyse the work of designers.</p> <p>Vocabulary - Analyse, Evaluate, Modernism, Less is More, Post Modernism, Less is a Bore, Fashion, Society.</p>	<p>Name - Bit Stop Bedside Storage Outline - This project will give you a sound understanding of some of the main manufacturing techniques used in industry in order to batch produce products using jigs, templates and formers. Previously gained experience in woods, metals and polymers will also be developed. CNC machining will be introduced in order to create a personalised finished product.</p> <p>Vocabulary - Personalise, Create, Template, Tessellate, Former, Jig, Batch, CNC Machine, Stock form, Flat Pack, Smart material, Stimulus, Ergonomics, Anthropometrics, Quality control,</p>	<p>Name - Coursework (NEA) Section 1 - Research Outline - Design possibilities identified and thoroughly explored through research.</p> <p>Vocabulary - Feasibility, Context, Possibility, Justify, User/Client, Justification, Comprehensive, Evidence, Brief, Analysis, Specification,</p>	<p>Name - Coursework (NEA) Section 2 - Ideas Outline - Creation of imaginative, creative and innovative ideas that show full consideration for functionality, aesthetics and innovation using a range of communication techniques.</p> <p>Vocabulary - Imaginative, Creative, Innovative, Generate, Investigate, Relevant, Extensive, Experiment, Strategy, Purpose, Design, Prototype, Dimension, Sketch</p>
	Homework/ Theory	Homework/ Theory	Homework/ Theory	Homework/ Theory	Homework/ Theory	Homework/ Theory

	<p>1 Properties</p> <p>2 Metals</p> <p>3 Woods and Boards</p> <p>4 Seasoning and Conversion</p> <p>5 Cutting</p> <p>6 Drilling</p>	<p>7 Polymers</p> <p>8 Composites</p> <p>9 Papers and Boards</p> <p>10 Orthographic Drawing</p> <p>11 Isometric/Perspective</p> <p>12 Types of Movement</p> <p>13 Levers</p> <p>14 Linkages and Cams</p>	<p>15 Gear Trains</p> <p>16 Pulleys and Belts</p> <p>17 Programmable Systems 1</p> <p>18 Programmable Systems 2</p> <p>19 Programmable Systems 3</p> <p>20 Textiles</p> <p>21 Marcel Breuer</p> <p>22 Philippe Starck</p>	<p>23 Stock Forms</p> <p>24 Chiselling, Planing, Turning</p> <p>25 Flat Pack Furniture,</p> <p>26 Wood Finishes</p> <p>27 Quality Manufacture</p> <p>28 Commercial Routing and Turning</p> <p>29 Scales of Production</p> <p>30 Smart, Modern Materials</p>		
Year 11	Non Exam Assessment	Non Exam Assessment	Exam Preparation	Exam Preparation		
	<p>Name - Coursework (NEA)</p> <p>Section 3 - Idea Development</p> <p>Outline - Development of design ideas using a wide range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Appropriate materials/ components selected with extensive research into their working properties and availability. Detailed manufacturing specification is produced with comprehensive justification to inform manufacture.</p> <p>Vocabulary - Development, Variety, Appropriate, Evidence, Technique, Method, Require, Available, Comprehensive, Justify, Virtual Model, Manufacturing Specification, Cutting List,</p>	<p>Name - Coursework (NEA)</p> <p>Section 4 - Manufacture Outline</p> <p>- Production of a prototype which shows a high level of making/finishing skills that are fully consistent and appropriate to the desired outcome. Quality control is evident to ensure the prototype is accurate by consistently applying very close tolerances, as well as safe working practises.</p> <p>Vocabulary - Quality, Consistent, Manufacture, Deadline, Fabricate, Assemble, Time Manage, Independent, Confident, Tolerance, Produce, Jig, Template, Measure, Sustainable,</p> <p>Name - Coursework (NEA)</p> <p>Section 5 - Evaluation Outline - Testing of all aspects of the final prototype against the design brief and specification. Detailed and justified reference is made to any modifications.</p> <p>Vocabulary - Test, Influence, Consider, Propose, Modify, Analyse, Reference, Feedback, Sketch, Present,</p>	<p>31 Design Strategies</p> <p>32 Dyson - Prototype Development</p> <p>33 Apple - Recycling and Disassembly</p> <p>34 Industry</p> <p>35 Enterprise</p> <p>36 Production Techniques</p> <p>37 Design Decisions</p> <p>38 Sustainability</p> <p>39 Energy Generation and Storage</p>	<p>40 Exam Preparation</p>	<p>END OF COURSE</p> <p>Note: Tier 3 vocabulary indicated in RED</p>	

#TheAllHallowsWay



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