

| Enrichment and Personal Development | | Links to Careers in Product Design | Catholicity in the Curriculum |
|-------------------------------------|---|---|--|
| Year 7 | <p>Sustainability, the environment, social, moral and cultural issues, recycling, commercial viability of products, industrial manufacture. 3D printing workshop held for Year 8 pupils with Create Education.</p> <p>Technology club is held once per week during the autumn and summer term for all key stage three pupils</p> | <p>Pupils will have exposure to industrial manufacturing and be able to use industry standard CAD programmes to design and develop their ideas. Pupils will know how to design and make products to meet customer requirements whilst being commercially viable. Pupils will have some awareness of possible job prospects in the designing and manufacturing sector. Possible future careers could be: surveying, architecture, engineering, building management, product design, interior design.</p> | <p>Creation and the Environment: Pupils consider the appropriate sourcing of materials including sustainability when designing and creating their mood lamp.</p> <p>Dignity: Pupils design for a wide target audience that do not exclude groups because of manufacturing techniques or materials.</p> |
| Year 8 | | | <p>Creation and the Environment: Pupils 3D print products using a bio-plastic rather than traditional fossil fuel based plastic and they understand the benefits to the environment.</p> <p>Creation and the Environment: Pupils understand the negative impact of traditional plastic on the environment such as extracting fossil fuels, increasing carbon emissions and the need to ensure sustainable techniques for future generations.</p> <p>The Common Good and Option for the Poor: Create Education speakers visit Holy Cross and deliver a full day practical workshop where pupils understand that 3D printing can have a positive impact on the quality of life eg in the production of prosthetic limbs in the UK and in developing countries.</p> <p>Dignity: In the practical workshop pupils understand how recent developments in 3D printing have had a revolutionary impact on the well-being and mental health of NHS patient with facial disfigurement.</p> |
| Year 9 | | | <p>Creation and the Environment: Pupils consider the appropriate sourcing of materials including sustainability when working on individual projects.</p> <p>Creation and the Environment and Dignity: Pupils must design packaging that is commercially viable which includes mandatory information such as recycle logo, Fairtrade logo, the Green Dot logo and safety information for consumers.</p> |
| Year 10 | <p>Social influences, the work of others, consideration of cultural influences, ethical factors, environmental concerns, product lifecycles. MBDA Missile System visit. This gives pupils an insight into industrial manufacture and how the design process we use in school is used on an industrial scale. Pupils can see how products are produced from initial conception final manufacture and distribution. The Leyland DAF visit gives pupils a real-life insight into how trucks are designed and manufactured, with close attention paid to the engineering element of production. Runshaw masterclasses to give pupils the opportunity to see what courses are available after school, in further education. BAE apprenticeship events where pupils are given a tour of the training facility and advice on how to apply.</p> | <p>Pupils will have first-hand exposure to industrial manufacturing (MBDA, BAE and Leyland DAF) and use industry standard CAD programmes and CAM machinery to design and manufacture products. Pupils will have frequent exposure to career options, KS5 and university options in the department. Pupils will also have the opportunity to visit local FE colleges to take part in masterclasses. Possible future careers could be: industrial design, set design, fashion, graphic design, CAD, technical illustration, any manufacturing industry.</p> | <p>The Dignity of Work and Participation and Solidarity: Pupils consider the importance of safe working conditions and fair pay particularly for those in manufacturing. They also consider ethical buying choices eg whether or not a company shares their values.</p> <p>Creation and the Environment, Option for Poor and the Dignity of Work and Participation: Pupils know and understand the positive impacts of Fairtrade and the importance of making ethical choices.</p> <p>Creation and the Environment: Pupils have a deeper knowledge of sustainability and can link it to how raw materials are sourced and ultimately how products can be recycled at the end of their lifecycle.</p> <p>Creation and the Environment and Option for the Poor: Pupils can give examples of products with high or low product miles and can articulate the benefits of buying locally.</p> <p>Creation and the Environment: Pupils are aware of the various types of pollution such as air, sea, visual etc and the negative impact on human health and the planet. Pupils can also suggest ways to prevent further deterioration.</p> <p>The Common Good, Option for the Poor, Dignity and Solidarity: Pupils learn about the positive impact of co-operatives particularly for the members and workers. Pupils also need to have an awareness of socio-economic issues and how that might affect their needs and wants when buying products. Pupils will then need to tailor their designs to fit these specific needs.</p> <p>The Dignity of Work and Participation: Holy Cross sources resources for our pupils locally where possible supporting sustainable and ethical companies.</p> |
| Year 11 | | | |



Key areas of focus in this unit of work



Subject specific knowledge



Assessment (including both formative and summative)



Interdisciplinary Learning



Progression of learning

Being able to design a product based on 'client' needs and wants. This includes designing, modelling, developing ideas, make appropriate prototypes, being able to select the correct tools and equipment. Pupils should also be expected to analyse products, complete evaluations and understand basic CAD/CAM (as well as other) systems.

Technology Department

Year 7, 8 and 9 Curriculum Plan



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| Year 7 | Year 8 | Year 9 |
|---|---|--|
| Carousel-8 Weeks Design and Make a USB Mood Lamp | Carousel-8 Weeks Design and Make a Desk Tidy and Stationery Set | Carousel-8 Weeks Mini Makes |
| Basic design technology knowledge, building on the elements that were covered in KS2. Pupils will complete a design and make project manufacturing a mood lamp using the steps of the iterative design process. Pupils will be required to analyse existing products, design, make models, manufacture a working product and evaluate it using appropriate QA and QC methods. | More advanced design technology knowledge, building on the elements that were covered in Year 7. Pupils will complete a design and make project manufacturing a desk tidy and stationery set using the steps of the iterative design process. Pupils will be required to analyse existing products, design, make models, manufacture a working product and evaluate it using appropriate QA and QC methods. All elements that are repeated (as they are core elements) will be more challenging than those in Year 7. | More advanced design technology knowledge, building on the elements that were covered in Year 7 and Year 8. Pupils will complete a design and make project manufacturing a range of items (phone stand, pin badge, fidget sphere and packaging) using the steps of the iterative design process. Pupils will be required to analyse existing products, design, make models, manufacture working products and evaluate them using appropriate QA and QC methods alongside a detailed record of manufacture. All elements will be more challenging than those in Year 8. Scaffolding will be removed and there will be GCSE style tasks throughout. |
| <ul style="list-style-type: none"> Material properties and uses Basic electronic components and their uses Circuit diagrams Presentation drawings CAD/CAM Manufacturing skills (traditional hand skills) Soldering and electronic circuit assembly | <ul style="list-style-type: none"> Writing a design brief and specification based on product analysis and client needs and wants Isometric/perspective drawing Presentation drawings Industrial manufacture (Blow moulding) Packaging design including vacuum forming CAD/CAM Record of manufacture | <ul style="list-style-type: none"> Product analysis Modelling and prototyping (Physical and CAD models) Presentation drawings Packaging design and construction CAD (2D Design and Tinkercad) CAM (Laser cutting and 3D printing) Evaluation including 3rd party feedback |
| Summative: Low stakes quizzes each lesson based on previous, current and future learning. End of unit test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills. | Summative: Low stakes quizzes each lesson based on previous, current and future learning. End of unit test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills. | Summative: Low stakes quizzes each lesson based on previous, current and future learning. End of unit test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills. |
| Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Formative: Command marking, verbal feedback, live marking, modelling and redrafting. |
| Science: Pupils are expected to be able to recall basic electronic symbols, understand their meaning and describe the uses of basic components. Pupils will draw basic circuit diagrams. Maths: Pupils will be expected to use equipment to measure accurately and be able to work out the value of resistors Geography: Pupils will be able to understand the importance of selecting sustainable materials and their positive effect on the environment Art: Pupils will learn about influential art eras and artists and be able to use sketching and colouring techniques to produce realistic drawings. | Science: Understanding how materials can be manipulated and how they are formed. Maths: Measuring accurately, isometric and orthographic drawing. English: Being able to analyse and evaluate products as well as write at length using subject specific terminology. | Science: Understanding the difference between thermoforming and thermosetting plastics, being able to understand and describe the process of fractional distillation. Maths: Measuring accurately, producing graphs based on data collection. English: Being able to complete a detailed ROM with justification and references to industrial manufacture throughout. |
| Pupils, in Year 7, are introduced to the iterative design process enabling them to understand how products are designed and manufactured. Pupils begin to develop their designing skills, being able to apply colour and annotate effectively. Basic electronics knowledge and skills as well as basic manufacturing skills with both timber and polymers are explored. All of these skills will be built upon in Year 8 and Year 9 | Pupils, in Year 8, will be expected to apply the skills and knowledge learnt in year seven to this project. Pupils will continue to develop their designing skills, be able to apply colour and annotate. Pupils will be able to present their drawings using a variety of different techniques. Their practical skills and confidence in the workshop will further develop and pupils will be expected recall practical skills from year seven to effectively complete this project. Pupils will also begin to develop their CAD skills and start to use other machines such as the 3D printers. | Pupils, in Year 9, will be expected to apply the skills and knowledge learnt in Year 7 and 8 to this project. Pupils will continue to develop their designing skills, be able to apply colour and annotate. Pupils will be able to present their drawings using a variety of different techniques. Their practical skills and confidence in using CAD programs and CAM machines will further develop and pupils will be expected recall practical skills and theory knowledge from both Year 7 and Year 8 to effectively complete this project. |



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Year 10 Curriculum Plan



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CATHOLIC HIGH SCHOOL

| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|--|---|--|--|---|
| Chair Challenge | Party Pack | Mock NEA (Board Game) | Mock NEA (Board Game) | Mock NEA (Board Game) | NEA (50% of final grade) |
| Design and make a cardboard chair to take their weight. (Product evolution, material research, materials testing, anthropometrics and ergonomics, industrial manufacture, school based manufacture, product analysis, 2D and 3D sketching, isometric and perspective.) | Design and make a range of items for a child's party pack using the iterative design process. Relevant theory knowledge. (product analysis, specification, brief, initial ideas, CAD, CAM, vacuum forming, mould manufacture, record of manufacture, evaluation) | Mock NEA: Design and make a board game Design and make a product using the iterative design process. (Product analysis, specification, brief, customer profile, initial ideas, idea development) | Mock NEA: Design and make a board game Design and make a product using the iterative design process. (CAD, CAM, electronics, manufacturing, record of manufacture, evaluation) | Completion of mock NEA project. (Manufacturing, record of manufacture, evaluation) | Introduction to NEA (Three contexts are given by the exam board, AQA, each June.) Pupils are to analyse each context and decide which they are going to focus on. |
| Selection of materials and components, forces and stresses, ecological and social footprint, sources and origins of materials. Printing processes, die cutting, | Using and working with materials, stock forms, types and sizes, scales of production, specialist processes. Paper and board theory with QC and QA. | Surface treatments and finishes, new and emerging technologies, energy generation and storage. Smart materials, modern materials | Developments in new materials, systems approach to designing, mechanical devices, materials and their working properties. | Environmental and social challenge, the work of others, design strategies, communication of design ideas, prototype development | Tolerances, specialist tools and equipment, specialist techniques and processes. |
| Summative: Exam questions each lesson. End of unit one test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Summative: Exam questions each lesson. End of unit two test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Summative: Exam questions each lesson. End of unit three test (either online or paper form) Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Summative: Exam questions each lesson. Final assessment of practical work based on acquisition and application of new skills Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Summative: Exam questions each lesson. End of unit four test (either online or paper form) Final assessment of practical work based on acquisition and application of new skills Formative: Command marking, verbal feedback, live marking, modelling and redrafting. | Summative: Exam questions each lesson. End of unit five test (either online or paper form) Formative: Command marking, verbal feedback, live marking, modelling and redrafting. *All end of unit tests are based on the learning of that particular half term. They are a mixture of low stakes multiple choice questions alongside long answer high tariff questions |
| Maths: Measuring human data, interpreting data, accuracy. Art- sketching and presentation techniques. Science: Forces and stresses, sources of raw materials. Geography: Ecological and social footprints. | | English: Analysing existing products. Science: Energy generation and storage. | Science: Electronics. Science: Mechanical devices. | English: Writing an in-depth and reflective evaluation of your product and performance. Geography: Environmental and social challenge. Art: The work of others, communication of design ideas. | |
| Pupils will be able to use the skills and knowledge learnt in KS3 and apply them to both practical and theory tasks in autumn one and two. Pupils will learn and apply as vast range of knowledge (see autumn two) | Substantive and disciplinary knowledge relating to specific topics (see above) Hinterland knowledge in relation to SMSC issues, disciplinary literacy relating to the subject area that is essential in NEA and exams, developing schema to link new topics and KS3 topics together. | Pupils will be able to apply their knowledge learnt in term one to their mock NEA. Pupils will be able to analyse a task, develop a client profile, analyse existing products, develop innovative and imaginative ideas that relate to their client requirements. | Pupils will be able to apply their knowledge learnt in term one to their mock NEA. Pupils will be able to develop an idea, explore manufacturing methods and techniques, identify correct tools and processes to make a working prototype. | Pupils will be able to apply their knowledge learnt in term one to their mock NEA. Pupils will be able to complete a record of manufacture that is detailed enough for a third party to understand and evaluate their products in depth against their manufacturing specification. | Pupils will be able to apply their knowledge of the structure of the NEA, to the investigation section. Pupil's will use the component knowledge they have gained during term 1-5 to complete this successfully. |





Technology Department

Year 11 Curriculum Plan



Holy Cross
CATHOLIC HIGH SCHOOL



| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 |
|---|--|--|---|---|
| NEA | NEA | NEA | Revision | Revision |
| NEA (50% of final grade) Design and make a product, based on specific exam contexts, given by the exam board, using the iterative design process. (Product analysis specification, brief, initial ideas.) | NEA (50% of final grade) Design and make a product, based on specific exam contexts, given by the exam board, using the iterative design process. (Idea development, CAD/CAM) | NEA (50% of final grade) Design and make a product, based on specific exam contexts, given by the exam board, using the iterative design process. (Manufacturing, record of manufacture and evaluation) | Focus on revision in preparation for GCSE exam. This will form 50% of the final grade. All content will have been covered throughout the GCSE course so recall, retrieval and the ability to use knowledge and apply to exam style questions will be a main focus Spring two. | Focus on revision in preparation for GCSE exam. This will form 50% of the final grade. All content will have been covered throughout the GCSE course so recall, retrieval and the ability to use knowledge and apply to exam style questions will be a main focus of Summer One. |
| <ul style="list-style-type: none"> Investigation (primary and secondary data) Environmental social and economic challenge The work of others | <ul style="list-style-type: none"> Design strategies, communication of design ideas Prototype development Selection of tools, materials and components. | <ul style="list-style-type: none"> Tolerances Material management Specialist tools and equipment Specialist techniques and processes. (Printing process, plastic moulding processes, material sources etc) | <ul style="list-style-type: none"> New and emerging technologies Energy generation and storage Developments in new materials Systems approach to designing Mechanical devices Materials and their working properties Designing and making principles | <ul style="list-style-type: none"> Selection of materials and components Forces and stresses Ecological and social footprint Source and origins Stock forms and types Scales of production Surface treatments and finishes |
| <p>Summative: Quizzes each lesson. Ongoing assessment of practical work based on acquisition and application of skills and knowledge.</p> <p>Formative: Command marking, verbal feedback, live marking, modelling and redrafting.</p> | <p>Summative: Quizzes each lesson. Ongoing assessment of practical work based on acquisition and application of skills and knowledge</p> <p>Formative: Command marking, verbal feedback, live marking, modelling and redrafting.</p> | <p>Summative: Quizzes each lesson. Ongoing assessment of practical work based on acquisition and application of skills and knowledge</p> <p>Formative: Final marking and submission of NEA.</p> | <p>Summative: Quizzes and exam style questions each lesson.</p> <p>Formative: Command marking, verbal feedback, live marking, modelling and redrafting.</p> | <p>Summative: Quizzes and exam style questions each lesson.</p> <p>Formative: Command marking, verbal feedback, live marking, modelling and redrafting.</p> |
| <p>Geography: Environmental social and economic challenge.</p> <p>Art: The work of others.</p> <p>Maths: Data interpretation.</p> | <p>Art: The work of others, communication of design ideas.</p> | <p>Geography/Science: Material sources.</p> | <p>Science: Energy generation and sources, mechanical devices.</p> | <p>Science: Forces and stresses.</p> <p>Geography: Ecological and social footprint.</p> |
| <p>Pupils will be able to apply their component knowledge learnt in during Year 10 to their NEA. Pupils will be able to analyse a task, develop a client profile, analyse existing products, develop innovative and imaginative ideas that relate to their client requirements.</p> | <p>Pupils will be able to apply their component knowledge learnt in during Year 10 to their NEA. Pupils will be able to develop an idea, explore manufacturing methods and techniques, identify correct tools and processes to make a working prototype.</p> | <p>Pupils will be able to apply their component knowledge learnt in during Year 10 to their NEA. Pupils will be able to complete a record of manufacture that is detailed enough for a third party to understand and evaluate their products in depth against their manufacturing specification.</p> | <p>Pupils will link together all the knowledge and skills they have acquired over the GCSE course. A cumulation of this will be their GCSE exam that will be during summer one or two. Pupils will embed a range of knowledge. (See summer one).</p> | <p>Substantive and disciplinary knowledge relating to specific topics (see above) Hinterland knowledge in relation to SMSC issues, disciplinary literacy relating to the subject area that is essential for exam success. Building schema to link topics together. The knowledge learnt over the GCSE course will be essential for KS5 learning and beyond. The skills and knowledge pupils have acquired will be built upon in any KS5 design and make courses. This will also apply to university courses and in the world of work.</p> |

