St Gabriel's Curriculum Map - Subject: Design and Technology/3D Design

Curriculum Intent	Design and Technology is an inspiring, rigorous and practical subject. It will allow them to identify the role which designers, manufacturers and consumers have in ensuring that products are created to have a positive impact on people's lives and with as little impact on the environment as possible. Students will use creativity and imagination to design and make products that solve real and relevant problems. The 3D Design curriculum aims to engage, inspire and challenge pupils through a wide variety of themes, preparing them with the knowledge and skills to experiment, imagine, invent and create their own work to express their identity, ideas, beliefs and feelings. 3D Design contributes to the Catholic ethos of the school in how pupils explore the wonder of God's creation and the details of His work through the investigation and development of their own art and design work. Pupils are also encouraged to value other's unique ideas and talents, beliefs and opinions. Pupils discover how design both reflect and shape our history, and contribute to the culture, creativity and wealth of our nation.

KS2	Time	7	8	9	KS3	10	11	KS4	KS5	Careers
Declarative Knowledge: Apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products for example, gears, pulleys, cams, levers and linkages Understand and use electrical systems in their products for example, series circuits incorporating switches, bulbs, buzzers and motors Apply their understanding of computing to program, monitor and control their products.	HT1	Lesson Topics at KS3 are delivered as part of a carousel throughout the Year Jewellery and Packaging (21 lessons) Design movements Design with inspiration CAD CAM Pewter casting Finishing techniques Iterative design Costing Tessellation Branding Product analysis Packaging	Plastic Clock (14 Lessons) Plastic research Product analysis CAD Product disassembly Workshop manufacture Finishing techniques Single use plastics Project reflection	Modelling and 3D CAD - Eco-building (14 Lessons) Renewable energy Scale drawing Smart materials Isometric CAD Rendering 2D planning Craft knife skills Modelling/ construction	Declarative Knowledge: Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users Critique, evaluate and test their ideas and products and the work of others Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions Understand how more advanced mechanical systems used in their products enable changes in movement and force 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] 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].	3DDesign Jewellery project Research inspirational sources Design development CAD/CAM Pewter casting Iterative design Finishing techniques Design adaptation Develop pewter jewellery range	3DDesign Architecture project cont. Material representation Design development through material application Planning for making CAD CAM Final architectural model manufacture	Declarative Knowledge: The way sources inspire the development of ideas, relevant to fine art including: How sources relate to individual, social, historical, environmental, cultural, ethical and/or issues-based contexts How ideas, themes, forms, feelings and concerns can inspire personally determined responses that are primarily aesthetic, intellectual or conceptual. The ways in which meanings, ideas and intentions relevant to fine art can be communicated Develop visual vocabulary to interpret the artwork of others and apply to their own artwork with meaning	**AQA A Level Holy Cross courses:** Photography, Graphics, Art and Design. **Bury College:** A level-Art, Craft and Design: Textile Design Graphic Communication Photography, A Level Photography, Foundation Diploma in Art and Design, Creative Media Production & Technology. **Bolton college:** Art, Design and digital media 'A' level Design and Technology with a specialism in either: Product design Fashion and Textiles Design engineering (not offered at local collages) Through one of the above design disciplines that reflect possible higher education routes and industry, students should: Identify market needs and opportunities for new products; Initiate and develop design solutions, and make and test prototypes/products; Develop intellectual curiosity; Work collaboratively gain an insight into the creative, engineering	Fashion and costume design Architect; Product design; Graphic design; Advertisement and promotion; Interior design; Multimedia artist and animating; Photography; Civil engineering; Mechanical engineering; Software engineering; CAD/CAM operation; Industrial production; Joinery and carpentry; Plumbing; Welding; Farrier
	HT2									
	HT3	Material research-timber Task and Product analysis and specification Practice drawing oblique and isometric techniques Planning for manufacture Marking out and cutting techniques and tools Finishing processes	Programmable control in everyday products Investigating Crumble: Using switches and motors. Investigating Using a light dependant resistor, distance sensor and two motors Making the prototype			3DDesign Jewellery project As HT1 and HT2 but develop broader range of jewellery using further inspirational sources from: Timber Acrylic	3DDesign Exam preparation Research Design Develop Experiment Plan/Schedule			

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		Finishing processes including wood dye and varnish project Evaluation	driverless vehicle Programming driverless car to negotiate given routes. Charting up results of driverless car challenge		Develop a critical understanding of its impact on daily life and the wider world and how technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation and the responsibilities of designers, engineers and technologists. Investigate new and emerging technologies, understand and use the properties of materials and the performance of structural elements, mechanical systems used in their products enable changes in movement and force and advanced electrical and electronic systems can be powered and used in their products. Develop and apply knowledge from other disciplines such as mathematics, science, engineering, computing and art.	Resin (with pewter) Leather Wire			and/or manufacturing industries; Develop the capacity to think creatively, innovatively and critically; Real world contexts Materials, components and processes; Management and development; Work safely and skilfully to produce high-quality prototypes/products; Critical understanding of the wider influences on design and technology; Apply understanding and knowledge from science and mathematics.	
Procedural Knowledge: Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately Select from and use a wider range of materials and components,	HT4 HT5 HT6				Procedural Knowledge: Use research and exploration, such as the study of different cultures, to identify and understand user needs Identify and solve their own design problems and understand how to reformulate problems given to them Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools Select from and use specialist tools, techniques, processes,	3DDesign Architecture project Research inspirational sources Primary research photo's Form - Block modelling Form - 3D CAD/ Rendering Form - Design development Form - Foam and other material	3DDesign Exam preparation & Exam Finalise all project work	Procedural Knowledge: **AO1:** Develop ideas through investigations, demonstrating critical understanding of sources. **AO2:** Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes. **AO3:** Record ideas, observations and insights relevant to intentions as work progresses. **AO4:** Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.		

including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities Investigate and analyse a range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Understand how key events and individuals in design and technology have helped shape the world					equipment and machinery precisely, including computer-aided manufacture Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties Analyse the work of past and present professionals and others to develop and broaden their understanding Investigate new and emerging technologies Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	modelling/ development Fine detail development Mock preparation and mock practical				