

Design & Technology – St Joseph's College

Subject vision statement

Our Design and Technology department envisions a vibrant learning environment where creativity and innovation converge. We aim to inspire students to explore, design, and create solutions that address contemporary challenges. By fostering critical thinking and collaboration, we equip our learners with the skills to navigate an ever-evolving technological landscape, promoting sustainability and ethical responsibility in all our projects. Together, we strive to develop the next generation of visionary designers and problem solvers who will make a positive impact on the world.

Respect for Faith – Students will have a level of autonomy throughout the curriculum, here they may choose to include designs inspired by their faith and religion.

Respect for Self – Students will develop the confidence in the subject to express themselves creatively. This is achieved through safe working environments and facilitating a positive working environment.

Respect for Learning – Stretch and challenge is built into the schemes of work. It is emphasised that ALL students must leave with a finished product regardless of their ability in the subject. Projects are adapted based on learners' needs with differentiated outcomes that enable students of varying abilities to be challenged.

Respect for Others – Students are encouraged and rewarded for helping others once they understand a concept. In a busy workshop, it is vital that students learn to work together in a safe environment. We encourage students to 'look out' for each other and for any hazards that become apparent during the lesson.

Respect for Wider Community – Resourcing materials and understanding the impact non-renewable resources have on the planet is built into the curriculum. The life cycle analysis of products are also studied whereby students consider what happens to products when they stop working. Through extra-curricular clubs, students will be providing design solutions for the school community such as creating signage and making their own litter grabbers in order to keep our school tidy.

Intent statement

It is acknowledged that students will have a varied experience of Design & Technology at KS2 therefore our projects are intended to introduce and steadily build confidence and technical knowledge in the subject through engaging and robust projects that are designed to inspire creativity, innovation and teach the fundamental elements of Design & Technology: Designing, Making, Evaluating.

Through a variety of creative and practical activities, pupils are taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. Pupils are taught to: **Design** by using 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. They will use a variety of approaches to generate creative ideas and avoid stereotypical responses. Students will develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools. **Make** through the selection and use of specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture. **Evaluate** by analysing the work of past and present professionals to develop and broaden their understanding. They will investigate new and emerging technologies and test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups. They will understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists. Technical knowledge will be developed through their understanding and use the properties of materials and the performance of structural elements to achieve functioning solutions.

Students will develop their literacy through the written communication required in each scheme of work, the testing of key words and subject-specific terminology. Numeracy will be integrated throughout the key stages; this will be taken from the specified maths requirements outlined by the exam board at GCSE (AQA).

Design and Technology is a unique subject because it bridges the gap between theoretical knowledge and practical application. D&T empowers students to use their understanding to solve real-world problems through hands-on creation, experimentation, and iterative design. The subject enables students to develop skills in problem solving, innovation and creativity, resilience and adaptability and communication. The cross-disciplinary approach integrates concepts from engineering, art, science and mathematics.

It is intended that each student will be able to make an informed decision whether to study Design & technology at GCSE and beyond.

Year 7						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Torch Project	Torch Project	Rotation 2 (food or graphics)		Rotation 3 (food or graphics)	
Building on (knowledge, concepts and skills) KS2	Students will have a varied experience of Design and Technology at KS2. They are given a baseline test to establish health and safety routines. Students will be taught the fundamentals of design and technology – Design, Make, Evaluate, Technical Knowledge.	Research methods, visual mood boards using basic internet search methods. Use of PowerPoint to present ideas. Drawing techniques.				
Building towards (knowledge, concepts and skills) KS3	Skills building. CAD/CAM is fundamental in this project. A strong understanding of 2D Design software will enable them to apply this skill throughout all of the DT projects studied. Students will learn about preparing files for the laser cutter before designing their own torch designs.	Making and assembly. Students are taught how to use tenso cement to glue acrylic along with basic circuitry (LED). Students then learn branding and design by making packaging for their torch. The packaging consists of a vacuum formed thermoforming plastic that is modified using a line bender. Evaluation is taught here.				
Independent enrichment (wider reading and learning suggestions)	From Idea to Career Booklet DT Terminology Materials Selection & Processing World Wise Web Podcasts What is laser cutting?	KS3 Design and Technology Dictionary by Peter Bull Working with Timber by ANON Building with Second hand stuff... by Chris Peterson				
SMSC	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.				

Careers	CAD/CAM is used throughout the design, engineering, construction sectors and beyond. Links to these jobs will be signposted to students. Architecture, 3D Modelling, Mechanical Engineering, Fashion, Interior Design.	Graphic Designer, Branding, Marketing and Promotion, Copywriter.		
----------------	--	--	--	--

Year 8						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Maze Game Project	Maze Game Project	Rotation 2 (food or graphics)		Rotation 2 (food or graphics)	
Building on (knowledge, concepts and skills)	Students would have experienced the cycle of designing, making and evaluating in Year 7. This project is focused on practical workshop skills and teaches students about health and safety in the and producing products for other people.	Data is collected to inform their designs and colour choices. Maths is linked here through bar charts and pie charts. Evaluation should reflect explicitly on their process and outcomes.				
Building towards (knowledge, concepts and skills)	Designing with others in mind and emphasising user-centred design. Introduction to workshop conduct, health and safety and correct use of tools. Avoiding design fixation through development and the iterative design process.	Introduction to wood joining methods, sources of wood and the impact on our environment. Metal and acrylic are also used and environmental impact considered in the same way. Vacuum forming, metal bending and sanding are used throughout. Wood finishing techniques are taught.				
Independent enrichment (wider reading and learning suggestions)	Choosing and using hand tools. By Andy Rae www.technologystudent.com http://www.design-technology.info/home.htm www.bbc.com/bitesize/subjects	Woodworking Manual. By Jackson Day www.design-technology.info/ https://www.stem.org.uk/secondary/resources/collections/home-learning-support/d-and-t-resources				
SMSC	Through Research, Designing, Making and Evaluating: Spiritual development: sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.	Through Research, Designing, Making and Evaluating: Spiritual development: sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.				
Careers	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.				

Year 9						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Box Project	Box Project	Rotation 2 (food or graphics)		Rotation 2 (food or graphics)	
Building on (knowledge, concepts and skills)	Students are expected to have a secure knowledge and understanding of the key concepts of the subject; Design, Make, Evaluate and technical skills. This project encourages students to make a bespoke item for a single client.	Students are encouraged to modify their boxes for the bespoke needs of their chosen client. This will prepare them for the requirements outlined by the AQA exam board should they chose the subject for GCSE.				
Building towards (knowledge, concepts and skills)	Wood joining methods using a differentiated outcome. Students will use a variety of hand tools and powered cutters to measure, mark and shape their bespoke wooden box. The application of the box is decided by the pupil through a user-centred focus on the client. All students make a box. The joints are chosen by each student based on their skillset.	Pupils are allowed to use a range of techniques to customise the box's appearance and appeal through use of different finishing processes, CAD/CAM, vacuum forming and custom trays/inserts. These could be inspired by an artist of their choice.				
Independent enrichment (wider reading and learning suggestions)	https://www.bbc.co.uk/teach/topics/c9xrzjnrlat www.design-technology.info/home.htm www.bbc.com/bitesize/subjects	Process: 50 Product Designs from Concept to Manufacture. By Jennifer Hudson The Eco-Design Handbook. By Alastair Faud-Luke Designs of the Times. By Lakshmi Bhaskaran				
SMSC	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. Cultural development willingness to participate in and respond positively to artistic opportunities.				
Careers	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.				

Year 10						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Entertainment Stand	Entertainment Stand	Bedside Organiser	Lighting Project	Lighting Project	Lamp Project + NEA

Building on (knowledge, concepts and skills)	Theory: Robotics, automation and production in industry. Production techniques and systems – automation Enterprise Market pull and technology push. People, society and culture. Sustainability and the environment Critical evaluation of new and emerging technologies – planned obsolescence Design for maintenance Ethics The environment Renewable and non-renewable resources Nuclear energy Energy storage Kinetic pumped storage systems Alkaline and rechargeable batteries Systems Types of motion Modern materials Smart materials	Theory: Composite materials Technical Textiles Material properties Functionality Aesthetics Environmental factors Availability Cost Social factors Ethical factors Designing: sketching modelling testing evaluation of work. The six Rs Ecological issues in design and manufacture Properties of materials Modifying properties for a purpose Commercially available types and sizes of materials Manufacturing specification/working drawings Tools, equipment and processes Quality control	Theory: Tools, equipment and processes Quality control Tolerance: How materials are cut, shaped and formed to a tolerance. The preparation and application of surface treatments and finishes Quality control Surface treatments and finishes Types of forces and reinforcing materials Manipulating materials to resist/work with forces	Theory: Investigate, analyse and evaluate the work of past and present designers/ companies. Generating imaginative and creative designs Using primary and secondary data to understand client and/or user needs. Market research, interviews, human factors Constraints that are presented to designers How to write a design brief Generating imaginative and creative designs	Theory: Generating imaginative and creative designs How to write a design specification Generating imaginative and creative designs Isometric and perspective designs Exploded diagrams Working drawings Computer-based tools Audio and visual recordings Modelling Satisfy the requirements of the brief Functionality Aesthetics Potentially marketable Materials are selected based on functionality, cost and availability Working accurately Cutting, shaping and forming materials to tolerance Planning the cutting of materials to minimize waste (linking to tolerance) Using measuring and marking out to create and accurate and quality prototype Selection of the correct hand tools and machinery	Theory: Safe use of tools Selection and use of specialist techniques (used to shape, fabricate, construct) Preparing a material for a surface finish Applying a surface finish How materials can be altered to change their properties Scales of production Commercial processes
Building towards (knowledge, concepts and skills)	Students undertake a series of mini tasks that help them further develop their skills in the workshop. They are encouraged to reflect on the process and create a personal learning booklet that they can refer to throughout the course.	Students produce a personalised outcome based on the key elements that will appear in the NEA project. They are encouraged to model, engage in interactive design with a user-centred focus.	A short project that prepares students to produce CAD/CAM work independently to produce a portable solution for a bedside organiser using a range of materials.	Example NEA style project to cover 3.3 Section C – Project 2 (lighting). Building iteration into a project in preparation for the NEA.	Students complete the lighting task using a range of resistant materials and a combination of CAD/CAM and hand processes that are relevant to the final outcome.	Contextual challenges released by the exam board on June 1 st . Students are to choose a challenge and begin researching the task, interviewing clients and exploring design solutions.
Independent enrichment (wider reading and learning suggestions)	https://www.dimensions.guide/ Wood and how to dry it. By Madeleine Kahn Design for the 21st Century. By Charlotte Fiell and Peter Fiell Thames and Hudson - the eco-design handbook. By Alastair Fuad-Luke	Design Museum: Contemporary Design. By Catherine McDermott Process: 50 Product Designs from Concept to Manufacture. By Jennifer Hudson The Eco-Design Handbook. By Alastair Fuad-Luke Rapid Contextual Design: Guide to key techniques for user centred design. By Karen Holtzblatt	Product Design. By Hodder Advanced Manufacturing D&T By Hodder	Sketching User Experiences: getting the design right by Bill Buxton Rapid Contextual Design: Guide to key techniques for user centred design. By Karen Holtzblatt	Designs of the Times. By Lakshmi Bhaskaran Arts & Crafts Companion. By Pamela Todd Bauhaus. By Benedict Taschen Memphis. By Bigitte Fitoussi The Measure of Man and Women: Human Factors in Design. By Alvin R. Tilley & Henry Dreyfuss Associates Sketching User Experiences: getting the design right & the right design. By Bill Buxton	AQA Design and Technology: Product Design (3D Design). By Nelson Thornes
SMSC	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.	Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning.

	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Willingness to reflect on their experiences.</p> <p>Moral development: understanding of the consequences of their behaviour and actions, moral and ethical issues.</p> <p>Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds.</p> <p>Cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>
Careers	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.	Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.

Year 11						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	NEA + Revision	NEA + Revision for mock exam	NEA + Revision	Revision	Revision	
Building on (knowledge, concepts and skills)	Students will revise for November mock exam alongside completing the NEA in class under teacher supervision.	Students will revise for November mock exam alongside completing the NEA in class under teacher supervision.	Students will revise for Summer exam alongside completing the NEA in class under teacher supervision.	Students will revise for Summer exam.	Students will revise for Summer exam.	
Building towards (knowledge, concepts and skills)	Students will be working on their NEA, worth 50% of their GCSE qualification. They will be responding to a choice of three briefs released yearly by the exam board (AQA). They work on this independently over the course of 35 guided learning hours.	Students will be working on their NEA, worth 50% of their GCSE qualification. They will be responding to a choice of three briefs released yearly by the exam board (AQA). They work on this independently over the course of 35 guided learning hours.	Students will be working on their NEA, worth 50% of their GCSE qualification. They will be responding to a choice of three briefs released yearly by the exam board (AQA). They work on this independently over the course of 35 guided learning hours.	Students will complete a series of exam papers, Seneca and revision clocks in order to secure theory knowledge and further develop exam technique.	Students will complete a series of exam papers, Seneca and revision clocks in order to secure theory knowledge and further develop exam technique.	

<p>Independent enrichment (wider reading and learning suggestions)</p>	<p>https://www.dimensions.guide/</p> <p>Wood and how to dry it. By Madeleine Kahn</p> <p>Design for the 21st Century. By Charlotte Fiell and Peter Fiell • Thames and Hudson - the eco-design handbook. By Alastair Fuad-Luke</p>	<p>Design Museum: Contemporary Design. By Catherine McDermott</p> <p>Process: 50 Product Designs from Concept to Manufacture. By Jennifer Hudson</p> <p>The Eco-Design Handbook. By Alastair Fuad-Luke</p> <p>Rapid Contextual Design: Guide to key techniques for user centred design. By Karen Holtzblatt</p>	<p>Product Design. By Hodder</p> <p>Advanced Manufacturing D&T . By Hodder</p> <p>AQA Design and Technology: Product Design (3D Design). By Nelson Thornes</p>	<p>Sketching User Experiences: getting the design right & the right design. By Bill Buxton</p> <p>Rapid Contextual Design: Guide to key techniques for user centred design. By Karen Holtzblatt</p>	<p>Designs of the Times. By Lakshmi Bhaskaran</p> <p>Arts & Crafts Companion. By Pamela Todd</p> <p>Bauhaus. By Benedict Taschen</p> <p>Memphis. By Bigitte Fitoussi</p> <p>The Measure of Man and Women: Human Factors in Design. By Alvin R. Tilley & Henry Dreyfuss Associates</p> <p>Sketching User Experiences: getting the design right & the right design. By Bill Buxton</p>	
<p>SMSC</p>	<p>Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. moral and ethical issues. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. moral and ethical issues. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>	<p>Through Research, Designing, Making and Evaluating: Spiritual development : sense of enjoyment and fascination in learning about themselves, others and the world around them. Use of imagination and creativity in their learning. Willingness to reflect on their experiences. Moral development: understanding of the consequences of their behaviour and actions. moral and ethical issues. Social development socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds. cultural development willingness to participate in and respond positively to artistic opportunities. Understanding and appreciation of the wide range of cultural influences that have shaped their own heritage and that of others.</p>			
<p>Careers</p>	<p>Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.</p>	<p>Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.</p>	<p>Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.</p>	<p>Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.</p>	<p>Joiner, CAD engineer, Architect, Steel Fabricator, Mechanical engineer, product designer.</p>	

