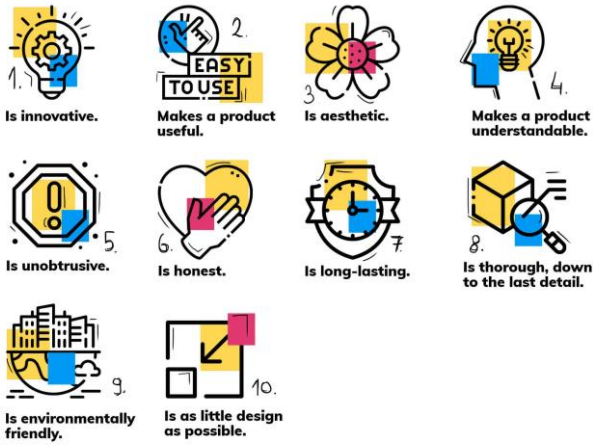
St Paul's Academy

Design and Technology Curriculum Overview

Why we teach Technology at St Paul's Academy

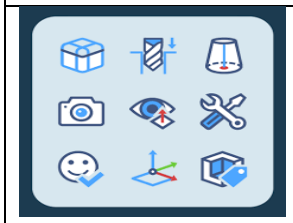
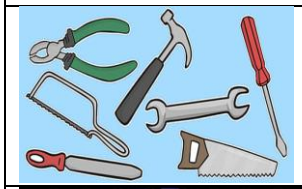
We teach Design and Technology to prepare students to participate confidently and successfully in an increasingly technological world using an interactive and creative approach. At ST Paul's Design and Technology is a subject that brings learning to life, requiring learners to apply their learning to real-life situations. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise. (Personalize to why you teach DT)

According to Dieter Rams 1970, a good design:



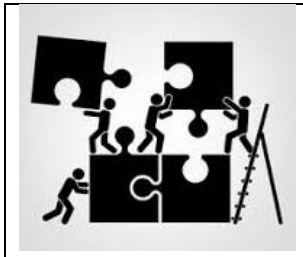
Disciplinary Knowledge (Practical)

Things our DT students should all know as designers and skills they need to acquire:

	***Explore:*** Risk assessment Carpenter tools Materials
	***Design:*** Generating, developing, modelling and communicating ideas
	***Make*** Measuring, Cutting, assembling, finishing.
	***Evaluate*** Feedback Iteration Assessment

Substantive Knowledge (Theory)

What do our DT students need to know:

	*The work of others:* *Design Movement Timeline* *Analyse existing products* Design Feasibility User Needs
	*Health & Safety:* *Safety rules, PPE, risk assessment,*
	Design Communication: Knowledge of drawing techniques Genre of design Feature of genre Design specification Sustainable Design
	*Materials sources & origin:* *Timber, board and paper.* *Plastics* *Smart materials*

School values/ Careers Links

Ambition in Design & Technology: How We Live It

Design and Technology is an inspiring subject that empowers students to bring their creativity and innovation to life. Our commitment to **ambition** drives us to push the boundaries of what's possible—challenging students to think critically, solve real-world problems, and aim high in every project.

We place a strong emphasis on **knowledge**, ensuring that all designs are grounded in a deep understanding of key concepts, materials, and processes. Through a coherent and structured curriculum, we connect ideas logically across topics, enabling students to build confidence and fluency as they progress.

Our department embraces **adaptability**, encouraging students to respond to feedback, refine their work, and stay up to date with emerging technologies. By cultivating a mindset of continuous improvement, we strive for **excellence** in every aspect—from sketching and prototyping to final construction and evaluation.

We also champion **enrichment**, providing wider learning opportunities through competitions, STEM partnerships, and creative workshops. This helps students broaden their perspectives and explore the exciting career pathways that Design and Technology unlocks.

From **robotics and product design** to **civil, mechanical, electrical engineering**, **interior design**, **software development**, and **industrial innovation**, our subject equips students with the creative thinking, technical precision, and ambition to thrive in a fast-evolving world.

St Paul's Academy
Design Technology - Key Stage 3 Curriculum Map (9-week rotation)

SK Themes and colours	The work of other	Health & Safety	Tools & Equipment	Materials sources and origin
DK Big Ideas and colours	Explore	Design	Create	Evaluate

KS3	**Autumn 1**
Year 7	**Topic Title: Pewter Casting** **Key Question: Why do we use formers when casting?** **Key Vocabulary:** **Design & Art Styles** • *Art Nouveau, Art Deco, Designer, Design Movement* **Shapes & Styles** • *Organic, Geometric, Architecture, Interior Design* **Materials** • *Pewter, MDF, Softwood, Hardwood, Manufactured board* **Measuring & Marking** • *Centimetre, Millimetre, Marking out, Grain, Waste line, Isometric drawing, Freehand drawing* **Tools & Equipment** • *Metal rule, Coping saw, Junior hacksaw, Bench vice (wood), Metal vice, Pillar drill, Hand file, Jig* **Processes** • *Casting, Heating, Melting, Quenching, Deforming, Reforming, Cooling, Fusing*

<table>
<tr><td></td><td>
Safety & Finishing
PPE, Sandpaper, Glass paper, Oven, Forge, Temperature, Sieve, Enamel powder
Design Thinking
Function, Materials, Ergonomics, Sustainability, Evaluate, Analyse, Design Brief, Design Specification, ACCESS FM, Former
<table>
<tr><td>SK</td><td>Design Era Timeline: Art Nouveau and Art Deco; Analysing existing product</td><td>Safety rules and hygiene practises that govern the workshop.
PPE used in the workshop.</td><td>Holding equipment, marking out -tri square, steel rule.
and hand tools-coping saw, file sand paper.</td><td>Wood- classification of natural timbers, manufactured Boards and metal.</td></tr>
<tr><td>DK</td><td>Students looking at PPE’s and Safety rules in relation to the keyring project.</td><td>Students generate keyring ideas on using basic 2D and 3D sketching techniques.</td><td>Students learn about basic hand tool processes used to create their keyring.</td><td>Students complete a final self-assessment on their finished project</td></tr>
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<tr><td>Year 8</td><td>
<h2>Topic Title: Biomimicry</h2>
<h2>Key Questions:</h2>
How can we copy nature to solve human problems or improve technology?
How can the design of animals or plants inspire aeroplane and flying technology?
<h2>Key Vocabulary:</h2>
Design & Nature Concepts
Biomimicry, Natural form, Imitation, Natural strategies, Eco-system, Sustainability, Aesthetic, Template
Examples in Nature
Burdock, Velcro, Tsunami alert systems, Aeronautics, Engineering, Medicine
Technology & Innovation
Smart materials, Artificial intelligence, Virtual reality, Biometric technology
Materials
Natural timbers, Hardwood, Softwood, Manufactured boards, MDF, Plywood
Tools & Equipment
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- *Coping saw, Tenon saw, Tri square, Bench vice, Bench hook, Sandpaper, PPE (Personal Protective Equipment), Carpentry tools*

Design & Product Considerations

- *Customer, Shape, Function, Safety*

<table>
<tr><td>SK</td><td>Students study how nature has inspired human design, focusing on examples such as Art Nouveau, Velcro (inspired by burdock), and how Animal or plant structures have informed the development of technologies like aeroplane wings.</td><td>Students learn essential safety practices when using tools and materials in the workshop, including the correct use of PPE for working with timber and modelling materials.</td><td>Students are introduced to, and safely use, tools such as the coping saw, tenon saw, tri square, and sandpaper as part of creating their biomimicry-inspired products.</td><td>Students explore the classification and properties of different materials such as hardwood, softwood, and manufactured boards that are used in their models or prototypes.</td></tr>
<tr><td>DK</td><td>Students research how nature solves real-[illegible] challenges and analyse examples of biomimicry in modern design, including applications in engineering, medicine, and aeronautics.</td><td>Students develop their own product based on a biological form or function, considering the shape, purpose, sustainability, and user needs in their design choices.</td><td>Students bring their ideas to life by modelling their designs using workshop tools and materials, applying safe working practices throughout the making process.</td><td>Students reflect on their final product considering how effectively it mimics the natural inspiration, and use ACCESS FM to evaluate strengths & areas for improvement.</td></tr>
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<tr><td>Year 9</td><td colspan="5">

Topic: Storage Project

Key Question:

What design features and styles would best match the look and feel of a specific room?

Key Vocabulary:

Design Process & Planning

- *Client/User, Design Brief, Design Specification, Product Analysis, Ergonomics, Anthropometrics, Sustainability, Carbon Footprint*

Materials

- *Natural Timbers, Hardwood, Softwood, Manufactured Boards, MDF, Plywood, Chipboard, Bio-plastic, Biodegradable Plastic*

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Plastics & Properties

- *Thermoplastics, Thermosetting Plastics, Finite and Non-finite Resources*

Making & Production

- *One-off Production, Batch Production, Mass Production, Continuous Production, Modelling, CAD, CAM*

Drawing & Presentation

- *Isometric Drawing, Perspective Drawing, Rendering, Annotation, Accuracy*

Design Thinking & Influence

- *Iterative Design, Plagiarism, Design Inspiration (e.g. Kusheda Mensah)*

SK	*Students explore how designers like Kusheda Mensah and other contemporary creatives use form, function, and sustainable materials in their furniture & storage designs.*	*Students learn safe workshop practices, including how to correctly use tools and equipment such as coping saws, tri squares, sanding blocks, & bench vices. Proper use of PPE is reinforced.*	*Pupils develop familiarity with measuring, marking out, and cutting They learn how to accurately use equipment such as tenon saws, clamps, tri squares, and sandpaper to ensure precision in their work.*	*Students explore and classify different types of woods and boards (hardwood, softwood, MDF, plywood, chipboard), and evaluate their properties, sustainability, and environmental impact.*
DK	*Students analyse existing storage solutions and furniture to understand their purpose, aesthetics, suitability for different environments. consider anthropometrics and ergonomics in relation to user needs.*	*Pupils develop ideas for a storage product that fits a specific client brief. They use 2D and 3D sketching techniques (e.g. isometric and perspective), rendering, annotation, and user feedback to refine ideas.*	*Students model and make their final product using a combination of woodwork techniques, CAD/CAM (if applicable), and accurate measuring and joining methods to ensure a high-quality outcome.*	*Pupils reflect on their final outcome, using **ACCESS FM** to assess the strengths, functionality, finish, and overall quality of their product. Suggestions for improvement are supported by clear evidence.*

St Paul's Academy
Design Technology - Key Stage 4 Curriculum Map – Topics by Term

SK themes and colours	SK1 Core Technical knowledge (materials, tools, processes, systems)	SK2 Practical design and making knowledge (drawing, modelling, prototyping, CAD)	SK3 Theoretical understanding (sustainability, ergonomics, design movements, smart materials)	SK4 NEA structure and assessment knowledge (research, brief, specification and evaluation)
DK Big Ideas and Colours	DK1 Applying knowledge to respond to design problems	DK2 Evaluating and improving practical and design work	DK3 Justifying design decisions with evidence	DK4 Communicating ideas clearly through sketches, modelling and annotation.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	**Introduction & Core Principles**	**Material Properties & Tools**	**Design Communication**	**Mechanical & Electronic Systems**	**User-Centred Design & Sustainability**	**Mini NEA Project**
	SK SK1, SK3	SK1, SK2	SK2, SK4	SK1, SK3	SK3, SK4	SK2, SK4
	DK DK1, DK2	DK2, DK3	DK1, DK4	DK1, DK3	DK2, DK3	DK3, DK4
Year 11	**Start Real NEA**	**Design Development**	**Final Making & Testing**	**Finish NEA & Start Revision**	**Exams Revision**	**Final Exam & NEA Submission**
	SK SK3, SK4	SK2, SK4	SK1, SK2	SK1, SK4	SK1, SK3	SK2, SK4
	DK DK1, DK4	DK2, DK4	DK2, DK3	DK1, DK3	DK1, DK2	DK3, DK4