

Design & Technology Product Design – Construction

“The Essence of All Things Tangible” Steve Slimm

Summerhill students will be **valuable members of society**

Students will appreciate the impact that good design of products and structures has on their world.

All students will develop a deep awareness of issues around designing inclusively for a diverse population, including aspects of different societies / demographics.

They will embody the concept of responsible design, fully aware of ethical interaction with users and producers, and having a finely tuned appreciation of sustainable design.

Students will be taken to the limit of their potential and fully prepared for further study or employment as robust problem-solvers.

Summerhill students will be **skilled communicators**

Students will understand the power of design to communicate and reflect ideas in a range of formats. They will be able to articulate their ideas to share and communicate their design concepts to end-users and third parties.

Students will be adept at communicating their design ideas formally and informally via hand drawings and digital media including CAD. They will be confident at interpreting and creating formal plans and working drawings.

Students will have an extensive vocabulary of technical terms relating to processes, materials and key issues. They will use this language to communicate with precision to a professional level.

Summerhill students will be **knowledgeable**

Students will learn about the design process, how to identify and develop new product opportunities, carry out applied research, test their ideas through working prototypes, and how designs can be prepared for manufacture on an industrial scale.

Students will develop a strong understanding of a range of relevant materials and techniques used to construct products and buildings, including how to do so safely and responsibly.

Students will be able to apply their knowledge as aspiring designers or trade people with creative, critical, analytical, conceptual, and practical skills to create finished artefacts and/or structures.

Our curriculum is underpinned by four key values:

Courage - doing what is right; being truthful; trying new experiences; taking risks in the pursuit of personal development

Ambition - having the highest aspirations and expectations of ourselves / others; being brilliant in all we do; having belief that challenges can be overcome with the right attitude and hard work

Respect - thinking about the way we interact with others; being considerate to ourselves, others and the environment; responding to expectations and working together in teams

Effort - investing time and energy to achieve success; always giving our best in everything we do; demonstrating resilience

Design & Technology Curriculum Overview

Year	Key Features	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
7	All students for one double period per week, for a third of the year (rotation with Food & Textiles)	Desk Tidy <ul style="list-style-type: none"> - Application of a design Strategy - Analysing a brief - Using hand tools to shape MDF - Vacuum forming 		Eames Elephant <ul style="list-style-type: none"> - Working with sheet aluminium - Hand files, hack saws and tins snips to shape the aluminium - Learning about industrial processes for accuracy and repetition - Iconic design 				
8	All students for one double period per week, for a third of the year (rotation with Food & Textiles)	Pinball machine <ul style="list-style-type: none"> - Learn how mechanical systems produce different sorts of movement and types of motion - An overview of different types of motion - The effect of forces on the ease of movement 		Pen Box <ul style="list-style-type: none"> - Metal lathe - Laminating veneers - Industrial processes to fabricate ferrous and non-ferrous steels - Hand tools - Pewter casting - The use of machinery to shape and remove material from soft wood 				
9	Optional 2 periods per week	Sketching and pizza cutter <ul style="list-style-type: none"> - Two-point perspective - Rendering - Thumb nail sketching - Rendering - Ergonomic design - Product Analysis - Concept modelling - Presenting design intentions 		Engineered Lamp <ul style="list-style-type: none"> - Working to a high degree of accuracy - Producing a manufacturing specification - Problem solving 	Wind Turbine <ul style="list-style-type: none"> - Design and make a prototype for a wind turbine which will produce enough power to meet specific needs. Problem solving - Iterative design process to create a design solution for an identified end user 	Mouse trap car <ul style="list-style-type: none"> - Build a vehicle that can travel as far as possible by using only the energy from a single mousetrap. - Students will design their own chassis and mechanism, to convert the energy from the mouse trap to propel the car forward 	NEA Exploration Students will look at the topic area that yr. 10 are covering to give them an insight into the requirements of the course	

Year	Key Features	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10 GCSE	<p>Optional 3 periods per week</p> <p>Studying towards OCR Product Design</p> <p>Contact time split between theory work and design & make tasks in preparation for the NEA</p>	<p>Pen Holder Identifying user and stakeholder requirements Modelling CAD skills Design iterations</p> <p>Theory Material properties Metals</p>	<p>Lamp Design Exploring thermos polymers to upcycle HDPE into an attractive light fitting. Students will need to base their designs around an existing light fixture and take into consideration the material properties to create a 3D form from 2D material</p> <p>Theory Timbers Polymers</p>	<p>Designing for the 3rd World Identifying problems Design research Responding to design problems</p> <p>Mini make projects e.g., how to integrate PCB and housing –</p> <p>Theory Ethical and sustainability design issues</p>	<p>Dyson disassembly Exploration of components and design decisions</p> <p>Mini make projects e.g. headphone/lathing/or laser batching mini project</p> <p>Theory Smart and modern materials</p>	<p>Furniture Laminating, casting, metal work, polymers and woodwork.</p> <p>This process- rich project is designed to enable students to have the skillset to have confidence in the workshop with a range of processes and machinery.</p> <p>Theory Inclusivity, ergonomics, scales of production</p>	<p>NEA – 50% of GCSE Exploration of design contexts Identification of primary user/stakeholder requirements Design Research</p>
11 GCSE	<p>Optional 3 periods per week</p> <p>OCR Product Design 50% NEA 50% Examination</p>	<p>NEA Design Ideas Design Iteration Modelling Responding to primary user/stakeholder requirements</p>	<p>NEA Modelling Design Iteration Manufacture</p>	<p>NEA Manufacture Testing Evaluation</p>	<p>Examination Prep Theory Examination technique Past Papers</p>		

Year	Key Features	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10 Construction	<p>Unit 1: Introduction to the Built environment On-screen examination: 1 hour 30 minutes 40% of qualification</p> <p>Unit 3: Constructing the Built Environment Controlled assessment: 30 hours 60% of qualification</p>	<p>Unit 1 – Introduction to the construction sector Unit 1 – The built environment life cycle</p> <p>Unit 3 – Skills development for trade-based task – joinery and carpentry</p>	<p>Unit 1 – types of buildings and structures</p> <p>Unit 1 – Technologies and materials</p> <p>Unit 3 – Skills development for trade-based task – joinery and carpentry</p>	<p>Unit 1 – Building structures and forms</p> <p>Unit 3 – Skills development for trade-based task – brick laying</p>	<p>Unit 1 – Building structures and forms</p> <p>Unit 3 – Skills development for trade-based task – brick laying</p>	<p>Unit 1 -Sustainable construction materials</p> <p>Unit 3 – Skills development for trade-based task – tiling</p>	<p>Unit 1 – trade, employment and careers Unit 1 – Health and safety</p> <p>Unit 3 – Skills development for trade-based task – tiling</p>
11 Construction	<p>Unit 1: Introduction to the Built Environment On-screen examination: 1 hour 30 minutes 40% of qualification</p> <p>Unit 3: Constructing the Built Environment Controlled assessment: 30 hours 60% of qualification</p>	Unit 3: Constructing the Built Environment Controlled assessment and preparation for mock examinations			<p>Examination Prep Theory Examination technique Past Papers</p>		