

# 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 AND TECHNOLOGY

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
7	<p>All students for one double period per week, for a third of the year (rotation with Food &amp; Textiles)</p> <p>Students will have the opportunity to use all the tools and machinery accessible to them over the two projects.</p>	<p><b>Desk Tidy</b></p> <ul style="list-style-type: none"> <li>- Application of a design Strategy</li> <li>- Analysing a brief</li> <li>- Using hand tools to shape MDF</li> <li>- Vacuum forming</li> </ul> <p>The desk tidy is to avoid design fixation so that all the outcomes are unique to the individual and needs of the identified end user.</p>			<p><b>Eames Elephant</b></p> <ul style="list-style-type: none"> <li>- Working with sheet aluminium</li> <li>- Hand files, hack saws and tins snips to shape the aluminium</li> <li>- Learning about industrial processes for accuracy and repetition</li> <li>- Iconic design</li> </ul> <p>The Eames Elephant is a focussed practical aiming to produce an outcome to a high degree of accuracy.</p>		
8	<p>All students for one double period per week, for a third of the year (rotation with Food &amp; Textiles)</p> <p>Year eight students are expected to apply the new skills they have covered in year 7 and be creative.</p>	<p><b>Pinball</b></p> <ul style="list-style-type: none"> <li>- In this project, you will be assessed on how well you can:</li> <li>- generate a range of ideas taking into consideration visual and technical issues.</li> <li>- develop a design proposal.</li> <li>- communicate your ideas clearly.</li> <li>- work with accuracy and skill.</li> </ul> <p>The pinball machine is made from a cardboard, with laser cut plywood as the flippers. It provides a great opportunity to explore the science of forces and motion.</p>			<p><b>Pen Box</b></p> <ul style="list-style-type: none"> <li>- Metal lathe</li> <li>- Laminating veneers</li> <li>- Industrial processes to fabricate ferrous and non-ferrous steels</li> <li>- Hand tools</li> <li>- Pewter casting</li> <li>- The use of machinery to shape and remove material from soft wood</li> </ul> <p>The Pen Box enables students to use the metal lathe, then create a box to reinforce hand tool skills and application.</p>		

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
9	Optional 2 periods per week	<b>Sketching and pizza cutter</b> <ul style="list-style-type: none"> <li>- Two-point perspective</li> <li>- Rendering</li> <li>- Thumb nail sketching</li> <li>- Rendering</li> <li>- Ergonomic design</li> <li>- Product Analysis</li> <li>- Concept modelling</li> <li>- Presenting design intentions</li> </ul>	<b>Stool</b> <ul style="list-style-type: none"> <li>- Learn how to joint timber.</li> <li>- An overview of different types of wood</li> <li>- Use hand tools with precision and accuracy</li> </ul>	<b>Engineered Lamp</b> <ul style="list-style-type: none"> <li>- Working to a high degree of accuracy</li> <li>- Producing a manufacturing specification-</li> <li>- Problem solving</li> </ul>	<b>Jewellery</b> <ul style="list-style-type: none"> <li>- Design and make jewellery using a range of metal forming processes.</li> <li>- Iterative design process to create a design solution for an identified end user</li> </ul>	<b>Microbit</b> <p>This is an introduction for robotics with the Kitronik :MOVE mini for BBC micro:bit.</p> <p>Program a buggy to move and add specific functions and commands.</p>	<b>Iterative Exploration</b> <p>Students will look at the topic area that yr. 10 are covering to give them an insight into the real-life design processes.</p>
10 GCSE	Optional 3 periods per week  Studying towards OCR Product Design 50% NEA 50% Examination  Contact time split between theory work and design & make tasks in preparation for the NEA	<b>Pencil Holder</b> Identifying user and stakeholder requirements Modelling CAD skills Design iterations  <b>Theory</b> Material properties Metals	<b>Side Table</b> Designing and manufacturing a creative resin and acrylic table top using CAD. Manufacturing metal hair pin legs with fixings to create a beautiful side table.  <b>Theory</b> Timbers Polymers	<b>Side Table continued</b>   <b>Theory</b> Ethical and sustainability design issues	<b>Lamp Design</b> Exploring thermos polymers to upcycle HDPE into an attractive light fitting. Iteration is at the heart of this project with students exploring materials and developing in a mixture of materials.  <b>Theory</b> Smart and modern materials	<b>Lamp Design continued</b>   <b>Theory</b> Inclusivity, ergonomics, scales of production	<b>NEA – 50% of GCSE</b> Exploration of design contexts Identification of primary user/stakeholder requirements Design Research

Year	Key Features	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
10 Level 1/2 Vocational Award	Optional 3 periods per week  Eduqas Level 1/2 Vocational Award in Construction and the Built Environment (Technical Award)  60% NEA 40% Examination	Unit 1 – Introduction to the construction sector Unit 1 – The built environment life cycle Unit 1 – types of building and structure Unit 1 Technologies and materials <b>And</b> Unit 3 – skills development for trade-based task 1- joinery and carpentry		Unit 1 – Building structures and forms. Unit 1 – Technologies and materials Unit 1 – Building structures and form. Unit 1 – Sustainable construction methods <b>And</b> Unit 3 – Skills development relevant to all areas of content for trade-based task 2		Unit 1 – Building structures and forms. Unit 1 – Sustainable construction methods Unit 1 – Trade, employment, and careers Unit 1 – Health and safety <b>And</b> Unit 3 – Skills development relevant to all areas of content for trade-based task 3 – Brick laying	
11 GCSE	Optional 3 periods per week  OCR Product Design 50% NEA 50% Examination	<b>NEA – 50% of GCSE</b> Design Ideas Design Iteration Modelling Responding to primary user/stakeholder requirements	<b>NEA – 50% of GCSE</b> Modelling Design Iteration Manufacture	<b>NEA – 50% of GCSE</b> Manufacture Testing Evaluation	<b>Examination Prep</b> Theory Examination technique Past Papers		
11 Level 1/2 Vocational Award	3 periods per week  Eduqas Level 1/2 Vocational Award in Construction and the Built Environment (Technical Award)  60% NEA 40% Examination	Unit 1 – Introduction to the construction sector Unit 1 – The built environment life cycle Unit 1 – types of building and structure Unit 1 Technologies and materials  <b>Trade option one assessment</b>	Unit 1 – Building structures and forms. Unit 1 – Technologies and materials Unit 1 – Building structures and form. Unit 1 – Sustainable construction methods  <b>Trade option two assessment</b>	Unit 1 – Building structures and forms. Unit 1 – Sustainable construction methods Unit 1 – Trade, employment, and careers Unit 1 – Health and safety  <b>Trade option three assessment</b>	<b>Examination Prep</b> Theory		

