

3D Design

Skill

3D Design allows students to gain a better understanding of the world we live in, and how designed is used in an applied context. Students will explore a wide range of material areas that will allow them to better understand design and the built environment as they will be given a 'Brief' to outline a functional context. Designers need to consider health and safety, social, moral and environmental issues when developing and making designs. These factors will be highlighted throughout the curriculum in 3D Design. They will also explore materials and techniques to respond to the need for creative design for products and the built environment.

Character

3D Design aims to develop independence in students, as they go on their own personal journey, guided by the teacher. When pursuing creative responses to defined functional needs students need to have imagination, resilience and grit. They also need to be intrinsically motivated so that they don't give up should they face an issue in their projects.

Experiences

Every child will have the opportunity to solve problems in practical ways. They will have the chance to design and make a products in the ceramic workshop using traditional making. They will also have the chance to look at existing designed objects and products in detail and analyse them so that they can take inspiration from them for their own work. Students will encounter real life problems with solutions and challenges that link to aspects Maths and Science.

Criticality

3D Design encourages students to think about the products and built environment and will broaden their capacity to analyse a wide range of different concepts. They first need to analyse a problem, they will then go on a journey to design and develop a product in an iterative way, which will mean that great resilience is needed as things often don't go right the first time. 3D Design requires students to think in a lateral way to reach an end goal, as there is often not one right answer to a problem. Students can show great creativity in this subject.

3D Design

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	Woods and Plastics Trinket Box		CAD CAM Headphone Wrap		Textile Toys	
Year 8	Designing with Levers and Linkages		Functional and Decorative – Ceramic Kitchenware		Architecture and Built Structures	

Year 7 and 8 fundamentals

Term and topic:	Fundamental knowledge	Entitlement vocabulary
<p>Year 7 Autumn Term:</p> <p>Woods and Plastics - Trinkets Box</p>	<ul style="list-style-type: none"> • How to analyse a 'design brief'. • How to develop and form a 'design specification'. • Workshop rules and safe workshop practice. • How recognise hazards and mitigate workshop dangers. • Planning for health and safety and undertaking dynamic risk assessments. • How to create a series of varied design ideas based on a brief and design specification. • Exploring the properties of various solid woods and manufactured boards. • Producing design concepts in response to a prescribed brief. • Safe use of a range of hand-held and machine operated tools in practical wood and plastic product production. • Accurate measuring and precision cutting within tolerance. • Manufacture of finished functional product using a range of woods and plastic materials. • Quality control and post-production product evaluation. 	<p>Hardwood, pine, softwood, MDF, PVC, Plywood, line, shape, form, configuration, brief, specification, health and safety, pillar drill, finisher, function, accuracy, wet & dry paper, tri-square, steel rule, marking out, hazard, risk assessment, safety goggles, protective equipment, design, workshop, hazard, technical drawing.</p>
<p>Year 7 Spring Term:</p> <p>CAD CAM Headphone Wrap</p>	<ul style="list-style-type: none"> • Analysing a 'design brief'. • How to undertake basic market research. • Product analysis of existing products to inform 'specification' development. • Use of ACCESSFM rule. • Production of design concepts in response to a prescribed brief. • Prototype model making. • 'Computer Aided Design' using '2D Design' software to plot design composition for laser cut product response. • How to translate initial manually drawn designs into CAD '2D Design' plotted compositions. • How to upload completed designs onto laser-cutter for CAM laser production. • Health and safety considerations when using a laser cutter. • The properties of laser cut acrylics. • Manufacturing quality control. • Post-manufacture marketing analysis 	<p>CAD (Computer Aided Design), CAM (Computer Aided Manufacture), 2D Design, Acrylic, brief, design, specification, engrave, font, text, shape, outline, scale, size, dimensions, analysis, market</p>

<p>Year 7 Summer Term:</p> <p>Textile Toy Design</p>	<ul style="list-style-type: none"> • Analysis of a textile 'design brief'. • Exploring market research. • Development of personal concept designs. • How to undertake existing product analysis to inform 'specification' development. • Pattern development and textile construction for textile response. • Incorporating seam allowances, for cut line and stitch line. • Health and safety rules for sewing machine and textile tools. • Practical sewing machine use - running stitch and zig zag stitch. • Basic hand stitching techniques in textiles. • The 6 R's of Sustainability. • 3D Prototype manufacture. • Post-production quality control. • 	<p>Brief, specification, textiles, seam allowance, cut line, stitch line, zig zag, cotton, bobbin, natural fibre, man made fibre, polyester, cotton, sustainability, recycle, reuse, reduce, refuse, rethink, repair, pattern.</p>
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Term and topic:	Fundamental knowledge	Entitlement vocabulary
<p>Year 8 Autumn Term:</p> <p>Force and Levers - Moving Novelty Cards</p>	<ul style="list-style-type: none"> • Distinguishing between types of motion. • Identification of fulcrums and pivots. • Use of developmental prototypes to explore mechanisms, lever configurations, inputs and outputs. • How to approach gathering market analysis. • Responding to a 'design brief'. • Development of a 'design specification'. • How to conceptualise initial design development ideas. • Identifying and justifying selected final designs. • Practical prototype development to include incorporation and integration of appropriate levers and linkages. • How to review and refine draft prototypes. • Practical production of final prototype samples. • How to present and demonstrate function of sample prototype to target market. • Evaluation and analysis of final design outcomes. 	<p>Brief, analysis, specification, mechanism, lever, linkage, research, linear, rotary, fulcrum. pivot, input, output, novelty, load, oscillating, reciprocating, target market, retail cost, components, configuration, split pin, prototype.</p>
<p>Year 8 Spring Term:</p> <p>Ceramic 3D Design - Functional Household Goods</p>	<ul style="list-style-type: none"> • How to research existing product ranges. • How to produce of 'mood board's and "concept research' collages. • Ability to analyse and respond to the work of appropriate designers and other relevant sources. • Development of a series of ideas through a range of purposeful investigations using a variety of design techniques. 	<p>Line, shape, tone, form, texture, scale, proportion, accuracy, composition, symmetry, three-dimensional, construct, relief, carving, clay,</p>

	<ul style="list-style-type: none"> • Respond to a brief to produce a design specification. • Select and use appropriate materials and techniques. • Demonstrate creative experimentation with a variety of appropriate tools and techniques. • Demonstrate ongoing refinement of ideas and concepts. • How to evaluate techniques and processes as an ongoing process. • Generate a three-dimensional response to brief with slab building and or coil building technique. • How to apply glazes and oxides for decorative purposes. • How to evaluate the technical effectiveness of ceramic outcomes. 	<p>wedging, firing, sculpt, slab, handle, slab-built, slump, hump, cone, base, cylinder, score, slip, stick, sgraffito, slip, kiln, glaze, oxide, mature, vitrify, imprint.</p>
<p>Year 8 Summer Term:</p> <p>Architecture and Built Structures –</p> <p>Architectural Design and Theatre Set Design</p>	<ul style="list-style-type: none"> • How to mind map, annotate and explain a thematic starting point. • How to present conceptual ideas visually and in writing. • How to research ideas about modern and traditional architecture and set design through a range of visual and written investigations. • How to present research to identified designers, architects and or other sources. • How to create original 2D design concepts linked to architecture or theatre set design, designers and other relevant sources. • How to select and use appropriate materials and drawing techniques e.g. drawing, painting etc. • How to explore 3D model making techniques in at least two different media e.g. card, foamboard, balsa, textile and wire frames etc. • How to experiment with a variety of appropriate cutting tools, materials and measuring techniques. • How to refine prototypes using appropriate tools, materials and techniques • Evaluate techniques and processes throughout the project. 	<p>Line, shape, tone, form, texture, colour, proportion, accuracy, scale, composition, symmetry, observation, perspective, tonal gradient, contrast, pressure, three-dimensional, construct, relief, Screen, layer, façade, structure,</p>