

Marshland Curriculum Overview

Design and Technology

Curriculum Intent

Design and Technology is an inspiring, rigorous, and practically led subject. Using creativity and imagination, students design and make products that solve real and relevant problems within a variety of contexts, considering user needs, wants and values. They acquire a broad range of subject knowledge and draw upon the wider curriculum of mathematics, science, computing and art. Marshland students are taught how to take risks, be innovative and creative through our curriculum.

Students learn to:

- Use creativity and imagination to design and make products that solve real world and relevant problems including those encountered in everyday life
- Build resilience and confidence to face challenges whilst raising their own self-esteem and developing personal interests
- Be able to work within a range of contexts, considering their own and other's needs, wants and values
- Acquire a broad range of subject knowledge, whilst learning how to take risks and become resourceful, innovative, enterprising and capable citizen in an increasingly technological world

How does our curriculum build upon previous learning?

KS3

The activities in design and technology lessons provide a broad range of opportunities and contexts for students to understand and use the properties of materials to achieve functioning products and three-dimensional outcomes. Many students may have never encountered projects like these, whilst others may have experiences that they can draw upon from home, therefore, our curriculum is designed to ensure that it is accessible for all students, regardless of background or experiences. Activities enable students to develop crucial life skills and express their own creativity, challenging students to push their boundaries and work to the highest standards regardless of their prior experience with DT at KS2.

KS2 focuses on teaching the basic principles of 'design', 'make' and 'evaluate' (DME), as an iterative framework cycle with a limited range of materials – which varies greatly depending upon individual school setting. By the end of KS3, students develop a deeper understanding and application of these core DME skills, taking into consideration more complex ideas which guide designing, for example, user need, material properties, aesthetics and technical limitations.

At KS3 we follow the national curriculum structure by following the DME cycle, however we go beyond these expectations with the breadth of opportunities available to our students. Through practical projects students understand the technical knowledge in context, and apply it to real life situations, rather than standalone theory lessons which can become a challenge to follow and apply. This deliberate, guided practice helps to embed learning to long term memory. KS3 also introduces a wider range of specialist tools and equipment, introducing areas such as scales of production, industrial processes, pedestal machinery and health and safety. During KS3 students also consider the impact of key events in the context of individuals, society, and the environment, but also how problem solving is at the core of high-quality design.

How does our curriculum build upon previous learning?

KS4	<p>Students following a GCSE in 3D Design will have a broad range of experiences from their younger years which they will continue to build, refer to and extend further throughout the course. Our KS4 course is an endorsement of GCSE Art and Design, and is aimed at bridging the space and overlap between Art and Design Technology, being rooted in creative, aesthetically pleasing solutions to user-led design problems. The course builds upon the skills, knowledge and understanding gained in KS3 using the DME model, extending it further into an 'industry-ready' approach. For example, rather than simply producing labelled design ideas, KS4 students are expected to support their idea development process to include working drawings, production planning, test pieces and modelling, parts-lists and so on. Students at KS4 use a wider variety of materials, techniques, processes and are expected to be mastering their own practice, considering a range of guiding principles, including client needs, material properties, process limitations and aesthetic considerations.</p>
------------	--

What do students <u>do</u> with this knowledge or these skills?	How do we help students secure this knowledge in long-term memory?
<ul style="list-style-type: none"> • Understand and use the properties of materials to achieve functioning solutions to a variety of problems • Develop creativity and insight through the DME process, by working on a range of projects, evaluating, and refining their own ideas. • Develop their ability to think critically and consider the world of art and design that has gone before them, to inspire and guide them. • Students can go on to study GCSE 3D Design, Art, or Photography – pursuing further study in this area including A levels, apprenticeships, or vocational courses. • Transfer their creativity, innovation and improved self-confidence to other aspects of the curriculum and to benefit their daily lives 	<ul style="list-style-type: none"> • Retrieval practice • Increasing storage strength by slowly removing scaffolding, interleaving questions from different topics and asking questions of incrementing demand • Targeted questioning in class • Revision of key topics and learning cyclically to reinforce learning • Core content in Knowledge Organisers is referred to and used • Deliberate practice of skills to commit to long term memory

How does our curriculum align to the national curriculum?

At KS3 we follow the national curriculum structure by following the DME cycle, however we go beyond these expectations with the breadth of opportunities available to our students. By following practical projects in this manner students understand technical knowledge in context, applying it to real life situations, rather than standalone theory lessons which can become a challenge to follow and apply. This deliberate, guided practice helps students to embed learning to long term memory.

Projects include the following aspects:

- Product design – students experience appropriate pedestal machinery, health and safety, industrial processes (e.g. vacuum forming, vinyl sticker cutting), CAD CAM (e.g. Laser cutting), aesthetics, ergonomics, user needs, material properties and characteristics, finishing techniques, product analysis and testing, historical art movements to inspire designing
- Textile design – types of fibres and material construction, ethical fashion, hand sewing, machine sewing, felting, pattern making, embellishment
- Food and Nutrition – is an important element of the curriculum and has its own statement documents and is located within the departmental area

How do we check student understanding and monitor progress?

Understanding is assessed regularly through many low-stakes approaches – verbal reasoning, retrieval practice in lessons, demonstration and refinement of technique, inferred reasoning and so forth. Formal assessments are sat regularly, with core knowledge retention evaluated. This gap-analysis underpins interventions and revision of content as appropriate.

Curriculum sequencing			
Year	Autumn	Spring	Summer
7	Y7 students complete a workshop-led project to create a small toy car, a multi-material outcome which introduces a range of core concepts:		
	<ul style="list-style-type: none"> ● Introduction to workshop, tools and working safely ● Taught about wood as a material ● Health & safety requirements ● Artist research - detailed for one artist 	<ul style="list-style-type: none"> ● Technical Drawing -Isometric drawing ● Technical Drawing -one-point perspective ● Designing ● Technical Drawing -orthographic drawing ● CAD - 2D design 	<ul style="list-style-type: none"> ● Painting, measuring and cutting ● Practical - measuring and cutting
8	Y8 students complete a textile felt creature project, focusing on designing their own outcome and developing design independence, considering materials and properties:		
	<ul style="list-style-type: none"> ● Research and mood boards ● Artist research ● Drawing skills to develop ideas ● Using a variety of hand and sewing tools with accuracy 	<ul style="list-style-type: none"> ● Sequencing complex tasks into smaller steps, including pattern making and production planning ● Working characteristics of materials (textiles) ● Modelling 	<ul style="list-style-type: none"> ● Finishing project ● Evaluating and testing outcome
9	Y9 students experience a workshop-led project to create a clock inspired by a historic art movement. The project introduces students to how a KS4 project could be structured or considered, to include:		
	<ul style="list-style-type: none"> ● Learning about GCSE 3D Design offer ● Research and consideration of historical contexts ● Artist copies ● Generation of innovative ideas ● Mind-mapping the design problem and target user 	<ul style="list-style-type: none"> ● Modelling design ideas ● Detailed planning – including testing, modelling, production planning and cutting lists 	<ul style="list-style-type: none"> ● Laser Cutter ● Clock assembly and decoration ● Testing and evaluating final outcome against initial design proposals and considerations

Curriculum sequencing			
Year	Autumn	Spring	Summer
10	<p>Y10 students extend their foundation KS3 knowledge and refine their understanding of how their work is assessed holistically following the GCSE AOs. Over the year they will:</p> <ul style="list-style-type: none"> • Complete practical tasks refining their knowledge and abilities using hand and pedestal machines with a variety of materials • Extend their understanding and experience using materials (wood and plastics) to create practical outcomes. <p><i>For example, students may be asked to create a wooden jointed box, where they are introduced to the working characteristics of the material (plywood), and complex wood jointing methods – rebates, butt joints, comb joints, biscuit joints etc. Students are then taught about surface finishes suitable for wooden products. Core knowledge is introduced practically to ground student understanding with real world experiences.</i></p> <ul style="list-style-type: none"> • Develop their ability to analyse design problems through set design contexts, creating independent analysis, research, ideas, production planning, modelling and evaluation of outcome • Look outwardly at the work of designers, artists, and craftspeople to inspire their own thinking and practice. 		
11	<p>Started in the summer term of Y10, students demonstrate their cumulative learning and experience from KS3 and KS4. The project is an open-ended brief, allowing students to demonstrate their understanding of the design process, craft-skills using appropriate tools, processes and equipment to create a high-quality outcome or solution to a design problem.</p> <p>From January of Y11, students complete an externally set assignment as the formally assessed exam element. A set of design contexts are published by the exam board, and students are supported to demonstrate their cumulative knowledge and skill through the production of a high-quality response.</p> <p>All student work from Y10 and Y11 can garner marks for students as an element of their assessed 'portfolio of skill', alongside the work that they complete for the externally set assignment.</p>		
Rationale for this sequencing	<p>KS3 exposes students to a range of foundation core DT skills that many will not have experienced previously. We aim to develop student confidence working in unfamiliar settings, instilling appropriate principles of health and safety, safe working practices, and develop 'designerly' creativity and curiosity. Students are given the opportunity to demonstrate existing knowledge, develop understanding of new techniques or processes, and experiment with a range of materials, ideas, and experiences.</p> <p>The curriculum becomes increasingly independent over the course of KS3, introducing key concepts and skills for KS4 study and beyond. Y7 projects are more didactic as students develop confidence through increasing elements of choice and independent application of taught skills to develop individual ideas and outcomes in Y8, ultimately selecting their own themes and target markets in Y9. This ensures students are supported appropriately by the curriculum scaffolding to be prepared for the intended KS4 curriculum.</p> <p>Key concepts are introduced and referred to throughout the KS, recalling the central principles of 'Design', 'Make' and 'Evaluate' to underpin and familiarise students with the curriculum, irrespective of material discipline. This spiral or cyclical approach supports students to embed learning and retain the core knowledge of KS3.</p>		

Curriculum sequencing

Year	Autumn	Spring	Summer
	<p>The GCSE qualification is broadly coursework based, with a portfolio of skills completed over Y10 and Y11, and an externally set examined unit completed in Y11. These projects are assessed against four common assessment objectives (AOs). Students are introduced to these AOs and asked to consider their own work reflectively and critically to assist with understanding how their work is assessed at the final award. These AOs are holistic, however could also broadly be said to represent the DME led approach to the design process that we build upon from KS3. Familiarity with the assessment framework and approach to project structure develops student confidence in approaching their project work and understanding how it is assessed.</p>		

How does our curriculum prepare students for the transition to post-16 pathways?

Our KS3 and KS4 curriculum prepares students well for continuing study beyond the school. As the design process is primarily principles led through the DME approach, these remain relevant through KS4, KS5 and beyond. It is a skillset and approach to creative thinking which underpins the design process. Many of the skills and experiences that our students have through the curriculum are transferable to a full range of creative and design-based courses – for example, art and design, 3D design, product design, engineering, textile design, home or interior design, architecture and so on.