Curriculum Mapping: Design & Technology - Graphics Year 10-11

St Martin's School
Be the best you can be

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	***Unit 3*** *Metals, Plastics, Paper & Board, Textiles*	***Unit 5b*** *Specialist Material: Paper & Board*	***Unit 6*** *Drawing Skills Designers and Design Companies*	***Unit 6*** *Design Strategies, Ergonomics and Anthropometrics*	***Unit 6*** *CAD/CAM Modelling Unit 1,2,4 - Environment*	***Non-Examined Assessment (NEA)*** *Section A Investigation*
	Material sources, properties, Stock forms, Uses Metals – Ferrous, non-ferrous and alloys Plastics – thermos plastic and thermosetting plastics Paper & Board types Textiles – natural and synthetic Health & Safety in a workshop	Paper & Board types, stock forms, standard sizes, properties, enhancement, uses. Calendaring, pulping, debarking, sizing. Die cutting and lithographic printing, perforations, deforestation, embossing, debossing, UV varnish	Isometric, oblique, orthographic, perspective drawing techniques, constructions lines, Design influence, design styles, geometric, bold colours, streamlined, modernist, architecture, fashion, product design, graphic design	User centred design, focus groups, design fixation, primary and secondary research methods, ergonomics, anthropometrics, users' needs and wants, target market, designers' responsibility.	CAD/CAM, development, card modelling, paper modelling, prototyping, kerf, tolerance, joining, laser cutting, vinyl cutting, CNC, extraction systems. Health & Safety in a workshop, material choice, tessellation, wastage.	Context Analysis, client, spider diagram, user, needs and wants, interview, justification, investigation, research, primary and secondary, impact on society, design possibilities, product analysis, site survey, initial ideas
	Justification: **Room Model Project** *Pupils extend their knowledge of the core material types and properties, how they are sourced and what they are used for. Theoretical study runs alongside practical activities to allow the pupils to explore working properties of materials. Pupils will design a scale model of a room for a chosen client and make it using core materials. Learning about accurate use of scale, modelling techniques, and the inherent mathematical skills. Core skills build on those learnt in KS3 and lay the foundations for the NEA and external exam.*	***Justification:*** **Blister Packaging** *Theoretical studies will be carried out alongside practical work to explore the specialist material area of Paper & Board. This will prepare pupils for the external exam and NEA. Pupils will make a specified blister package out of board and vacuum formed plastic, developing skills in working accurately, using CAD/CAM, laser cutting and hand produced graphics.*	***Justification:*** **Drawing skills** *Pupils will learn the* Isometric, oblique, orthographic and perspective drawing. These skills underpin designing, development and manufacturing specification elements of the NEA and external exam. **Designers and design companies** Pupils study the work of previous and existing designers and design companies to understand how this can influence their own designs. Activities will focus on one design and one design company from a given list.	***Justification:*** **Design Strategies** *Pupils learn the theoretical premise of how designers design and develop products for their intended users to give them an insight to user centred design* **Ergonomics & Anthropometrics** *Pupils will learn how ergonomics and anthropometrics form art of human centred design and the impact it has on the final outcome. Activities will include theoretical knowledge and practical making.*	***Justification:*** **CAD/CAM Modelling** *Pupils will develop one of their designs using hand modelling techniques and CAD/CAM modelling in preparation for the NEA. This will re-visit CAD to allow them to develop independent working skills using a variety of CAM machine such as the vinyl cutters. Accuracy of fit, machine tolerances and the performance of a range of materials will allow pupils to understand the complexities of prototyping products.*	***Justification*** **Section A – Investigate** *10 Marks* *Pupils chose one context set by the exam board. They will systematically break down the task through analysis, research and evaluation to focus on one design problem and their chosen user. User centred design principles are applied alongside primary and secondary research activities to help pupils determine criteria for their design solution.*

Assessment:
Each unit is assessed formally with a making grade and unit test. Feedback on interim work is given to pupils with the opportunity to revise and perfect their work.

Wider reading/Cultural capital
External speakers are invited to the school to widen pupils' knowledge of potential careers and opportunities within DT. Real life examples are built into learning wherever possible to give pupils access to how DT fits into the wider world. ***Wider reading includes*** *GCSE AQA Design and Technology by PG Online, New Grade 9-1 Design & Technology AQA Complete Revision & Practice (with Online Edition) by CGP Books,* Design Museum: Contemporary Design by Catherine McDermott, Process: 50 Product Designs from Concept to Manufacture by Jennifer Hudson, The Eco-Design Handbook by Alastair Faud –Luke, Sketching User Experiences: getting the design right & the right design by Bill Buxton.

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Year 11	***Non-Examined Assessment (NEA)*** *Section B & C* *Specification & Design Ideas*	***Non-Examined Assessment (NEA)*** *Section D* *Design Development*	***Non-Examined Assessment (NEA)*** *Section E & F* *Manufacture & Evaluation*	***Exam Preparation*** *Revision of all theory topics* *Units 1,2,4 & 5*	***Exam Preparation*** *Revision of all theory topics* *Units 3,6,7 & Math*	**Study leave**
	Design Specification, criteria, justification, aesthetics, cost, consumer, environment, size, safety, function, materials. Design style, annotation, isometric, perspective, exploded, rendering.	Modelling, iteration, innovation, creative, 2D & 3D, CAD/CAM, prototype, testing, user feedback, research, material properties, final design, manufacturing specification.	CAD/CAM, Quality Control, Health & Safety, making skills, tolerances, finishing, commercially viable. Testing, analysing, evaluating, modifications, user feedback.	Industry & Enterprise, Sustainability, People, Culture, Society, Production, Moder, Smart & Composite Materials, Systems, Mechanical Devices, Forces, Ecological and Social footprint, Scales of Production, Specialist material	Core materials: metal, timber, paper& board and textiles. User centred design, ergonomics, anthropometrics, drawing styles, and designers. Tolerance, datum, aesthetics, tessellation, finishes, surface preparation. Mathematical application	
	Justification: **Section B - Specification** *Pupils write a set of criteria for their design solution using the information found out in their research.* **Section C – Design Ideas** *Using the design specification as a guide pupils will produce a series of innovative and creative design ideas for their design solution. Annotating the designs and discussing them with their client to chose which solution to focus on.*	***Justification:*** **Section D - Development** Pupils develop their chosen design idea through modelling, evaluation, refining as part of the iterative design process to reach a final solution. They will produce a technical final design and production plan which will be used to inform the making of their final prototype.	***Justification:*** **Section E - Manufacture** *Pupils use a range of practical making skills to manufacture and finish their final prototype to a high quality with use of close tolerances.* **Section F – Analysis & Evaluation** *Pupils test the final prototype to assess fitness for purpose against the design specification, gaining client feedback to establish the overall success of their product and suggest future modifications.*	***Justification:*** Pupils to complete theoretical studies on the remaining areas of student which include core areas of Unit 1, 2 and 4. Recap on specialist material learning: RM – Timber GR – Paper & Board TX – Textiles Activities include, mini tests, exam questions, note taking and targeted questioning.	***Justification:*** Pupils to complete theoretical studies on the remaining areas which include core areas of Unit 3. Design and making principles of Units 6 & 7 Mathematical applied skills to DT contexts. Activities include, mini tests, exam questions, note taking and targeted questioning.	

Assessment:
External Assessment: *GCSE Design & Technology – 50% of GCSE*
Theoretical knowledge from Units 1-7. Written exam: 2 hours, 100 marks, Multiple choice questions, specialist material questions and design& making principle questions
NEA Internal Assessment: *50% of GCSE*
Substantial Design and make task completed as a A3, 22-page E-portfolio and completed 3D prototype.

Wider reading/Cultural capital
External speakers are invited to the school to widen pupils' knowledge of potential careers and opportunities within DT. Real life examples are built into learning wherever possible to give pupils access to how DT fits into the wider world. ***Wider reading includes*** The Measure of Man and Women: Human Factors in Design. By Alvin R. Tilley & Henry Dreyfuss Associates, Rapid Contextual Design: Guide to key techniques for user centred design. By Karen Holtzblatt, AQA Design and Technology: All Materials Categories and systems. By Hodder Education, Designs of the Times by Lakshmi Bhaskaran, Memphis. By Bigitte Fitoussi