

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

| Year | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|--|---|---|--|---|--|--|
| Year 10 | <p>Unit 3 Metals, Plastics, Paper & Board, Textiles</p> | <p>Unit 5a Specialist Material: Timber</p> | <p>Unit 6 Drawing Skills Designers and Design Companies</p> | <p>Unit 6 Design Strategies, Ergonomics and Anthropometrics</p> | <p>Unit 6 CAD/CAM Modelling Unit 1,2,4 - Environment</p> | <p>Non-Examined Assessment (NEA) Section A Investigation</p> |
| | <p>Material sources, properties, Stock forms, Uses Metals – Ferrous, non-ferrous and alloys Plastics – thermoplastic and thermosetting plastics Paper & Board types Textiles – natural and synthetic Health & Safety in a workshop</p> | <p>Hardwood, Softwood, Manufactured board. Managed forests, deforestation, felling, debarking, stock forms, properties, enhancement, wasting, abrasion, joining, CNC turning and routing, seasoning, bending and commercial manufacture.</p> | <p>Isometric, oblique, orthographic, perspective drawing techniques, constructions lines, Design influence, design styles, geometric, bold colours, streamlined, modernist, architecture, fashion, product design, graphic design</p> | <p>User centred design, focus groups, design fixation, primary and secondary research methods, ergonomics, anthropometrics, users' needs and wants, target market, designers' responsibility.</p> | <p>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.</p> | <p>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</p> |
| | <p>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.</p> | <p>Justification: Wooden Lamp Theoretical studies will be carried out alongside practical work to explore the specialist material area of Timber. This will prepare pupils for the external exam and NEA. Pupils will make a specified wooden Anglepoise lamp out of hardwood and softwood, developing skills in working accurately, using a range of hand tools and machines and finishing techniques. Pupils will be assessed on their making skills and theoretical knowledge via an end of unit test.</p> | <p>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.</p> | <p>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.</p> | <p>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 skills learnt during KS3 and allow them to develop independent working skills using a variety of CAM machines. Accuracy of fit, machine tolerances and the performance of a range of materials will allow pupils to understand the complexities of prototyping products.</p> | <p>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.</p> |
| <p>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.</p> | | | | | | |
| <p>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.</p> | | | | | | |

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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. | Study leave |

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