

D&T Product Design Curriculum Map



Year		AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
7	Knowledge and Skills	Steady Hand Game Knowledge: Health & Safety in the workshop. Workshop tools and equipment. Working properties of wood. Biomimicry. Electronic circuitry. Skills: Application of research skills through design development. Practical application of wood working skills. Joining methods. Oblique drawing. Electronic assembly. Maths Skills: Calculation area.	Steady Hand Game Continued... Knowledge: Health & safety in the workshop. Biomimicry to develop design ideas. Working properties acrylic. Skills: Electronics. Design development through Biomimicry. Painting techniques. Oblique drawing. Electronic assembly. Maths Skills: Calculation area and compound shapes.	Alternative DT subject on rotation Textiles / Food / Product Design		Alternative DT subject on rotation Textiles / Food / Product Design	
	Assessment	Students work towards completing workshop safety passport. Students receive verbal and formative feedback. Self-evaluation and assessment. Planned teacher feedback: Biomimicry design ideas – How well students have engaged with biomimicry.	Student's complete tools safety passport. Practical assessment: Processes, Safety, Tools & Equipment, Accuracy & Oblique Drawing skills Independence. Planned teacher feedback: Written test – whole class feedback.				
8	Knowledge and Skills	Mood Light Project Knowledge: Health & Safety in the workshop. Workshop tools and equipment Working properties of timber Working properties of polymers Identification of electronic components Skills: Design idea generation and development The practical application of wood working skills Working with jigs Joining and finishing techniques Product analysis. Maths Skills: 2D and 3D shapes.	Mood Light Project Continued Knowledge: Health & Safety in the workshop. Working properties of polymers Safe soldering technique Skills: Sketching techniques Working with jigs to manipulate polymers Joining and finishing techniques Soldering components and testing circuits Packaging design. Maths Skills: Calculate areas of cube.	Alternative DT subject on rotation Textiles – Food - Product Design		Alternative DT subject on rotation Textiles – Food - Product Design	
	Assessment	Students work towards completing their workshop safety passport. Verbal and formative feedback. Self-evaluation and assessment.	Student's complete tools safety passport. Lesson 13/14 Practical assessment: Correct processes, Safety, Accuracy & Independence. Written test				

9	Knowledge and Skills	Chocolate Packaging Project Knowledge: Health & Safety in the workshop. Workshop tools and equipment. Design Movements, Inclusive design, Scales off production. Working properties of manufactured boards, Polymers, Paper & Board, Working with nets. Skills: Design development for a given context. Drawing skills including use of colour theory, rendering and Isometric. Card modelling. The practical application of wood working skills to manufacture a Former. Computer Aided Design (CAD) to develop decoration for former. Maths skills: Nets and Area : & Volume.	Chocolate Packaging Project Continued Knowledge: Sustainability & 3 Rs, Carbon footprint, Polymer processes. Vacuum Forming. Typography, Brand Identification. Adhesives. Skills: Manufacturing use of Vacuum-Forming. Packaging Design, development and manufacture. Working with Nets, Creasing and Bending. Maths skills: Nets and Area : & Volume.	Alternative DT subject on rotation Textiles / Food / Product Design		Alternative DT subject on rotation Textiles / Food / Product Design	
	Assessment	Students will work towards completing workshop safety passport. Practical assessment: Correct processes, Safety, Accuracy & Independence. Design creativity and communication	Student's complete tools safety passport. Practical assessment: Workshop skills on machines/tools/processes. Safety, Accuracy, Independence. Lesson 13/14 Practical assessment: Correct processes, Safety, Accuracy & Independence. Written test				
10	Knowledge and Skills	Mini Skateboard Project Knowledge: Health & Safety, Workshop Tools and Equipment. Review Timbers overview, Lamination process, Scales of Production, Tessellation & wastage, Ergonomics & Anthropometrics, Polymers overview. Skills: Workshop H&S, Research: Client, interview/profile, Product analysis, Market & 3rd party research, Design and Make former, Lamination techniques, Vacuum Forming, Use of Hotwire to create polystyrene mould. Maths skills: Percentiles (linked to ergonomics and anthropometrics)	Mini Skateboard Project Continued Knowledge: Offset lithography, Die-cutting, Sustainability, Planned Obsolescence, Modern Materials, Composite Materials, Smart Materials. Blister packaging. Skills: CAD/CAM: Vinyl cutter for skateboard decoration, On Shape - 3D rendering build of skateboard. Design Portfolio power point. Maths skills: Percentiles (linked to ergonomics and anthropometrics) continued	Dyson Foundation Engineering box. Design from the inside out Knowledge: Existing designers, Commercial manufacture, Engineering roles. Skills: Dismantle and reassemble Dyson V12 parts, product analysis grabber.	Coaster Project Knowledge: Knowledge: Health & Safety, Workshop Tools and Equipment. Design Movements, Existing & New Designers, Hardwood, Softwood, Manufactured boards, Veneers, IKEA mega factories, CNC (Computer Numeric control), FMS (Flexible Manufacturing Systems) Skills: Create Design portfolio, Design Brief, Mood boards, work to a Manufacture Specification, 2D CAD/CAM Testing and Lamination manufacture of Design Movement inspired coasters. Design Portfolio Power Point. Maths Skills: Tessellation & wastage	Coaster Project Continued Knowledge: Manufacturing specification, Orthographic Plan View, Technological Push vs Market Pull, Sustainability, Fair Trade, Ethical Design, Fossil Fuels (Coal, Oil, Gas), Renewable (Wind, Solar, Tidal, Hydro, Biomass) Skills: Working from Plan drawings, Traditional wood working skills (various Joining methods) to create coaster box., 3D CAD create coaster box parts, mate & Render, create Orthographic Plan view, Isometric View. Design & Make Portfolio. Maths skills: Grids and coordinates (links to CNC manufacturing)	GCSE NEA (Non-Exam Assessment) Knowledge: Explore three contexts set by the exam board. Section A: choose context, Investigate context through client investigation and market research. Skills: Presentation and communication
	Assessment	Verbal and formative feedback. Practical assessment: Correct processes, Safety, Accuracy & Independence. Practical assessment of 3D CAD work.	Practical assessment: Design and Make of Skateboard & Blister packaging. Power point presentation.	Verbal and formative feedback. Self-evaluation and assessment Practical assessment: Correct processes, Safety, Accuracy &	Design creativity and communication	Practical assessment: Correct processes, Safety, Accuracy & Independence.	50% Assessed against GCSE NEA criteria 50% 2 hour written Mock exam

			Practical assessment of Power point presentation.	Independence. Written test			
11	Knowledge and Skills	<u>NEA Section A – Investigation</u> <u>Section B - Design brief and Specification</u> <u>Section C – Generating design ideas</u> Students will complete section A of NEA. This includes Client research and investigation, Market research Client & Biomimicry Mood Board, Design Brief, Design Specification.	<u>NEA. Section C continued.</u> <u>Generating Design ideas and Developing Design ideas.</u> <u>NEA Section D</u> Design strategies, Product analysis, 2D and 3D design communication, Environmental and social impact, Anthropometrics and Ergonomics, Material research, Joining methods research, Design development. 3D design development, testing through card modelling.	<u>NEA Section D continued</u> <u>Section E – Realising design ideas</u> 3D design development, testing through card modelling and 3D CAD. Manufacturing specification and Plan of making. Start realising (making) final design.	<u>NEA Section E continued</u> <u>Section F – Testing and evaluating.</u> Final product completed. Testing and evaluation of final product. Retrieval practice	<u>Final checks for NEA</u> NEA completed, Final photographs of products taken, NEA portfolios sent to Moderator. Retrieval practice and exam preparation	<u>Exam 18th June TBC</u>
	Assessment	Verbal and formative feedback. Self-evaluation and assessment	50% NEA Sections A, B, C Mock exam 1	50% NEA Sections A, B, C, D	50% NEA Sections A, B, C, D and E 50% Mock exam 2	50% NEA & Product	50% 2 hour written paper
12	Knowledge and Skills	<u>Introduction: Self-Reflection Project</u> <u>Knowledge:</u> Health & Safety in the workshop, Design Communication, Design Movements, Timbers overview, Physical and Mechanical properties, Composites, Branding, Intellectual property, Enterprise & Marketing. <u>Skills:</u> Design Development, Card/CAD modelling techniques, Design Portfolio power point, presentation skills. <u>4 Corner Box</u> <u>Knowledge:</u> Manufactured boards, Lamination, Traditional wood Jointing, component jointing methods, Adhesives, Modelling foam, Polymorph. <u>Skills:</u> Practical application of lamination techniques including, CAD/CAM Vinyl sticker, polystyrene moulds. Woodwork Jointing methods including Dovetail, Manufacturing to specified tolerances, QA & QC. CAD/CAM- Techsoft and laser cutter, 3D printer	<u>4 Corner Box Continued</u> <u>Knowledge:</u> Timber's overview, Wood Finishes, Polymers Overview, Polymer processes: vacuum forming, thermoforming, Calendaring, line bending, laminating (layup), injection moulding, blow moulding, rotational moulding, extrusion, compression moulding, Biodegradable polymers <u>Skills:</u> Risk assessment, Table router, plane, chamfered edge, Prong Tee nut, CAD/CAM On-Shape / Fusion. Maths skills.	<u>Dyson Foundation Design box.</u> <u>Knowledge:</u> Dyson (existing designers) National and International standards in product design, BSI, ISO, Restriction of Hazardous Substances (ROHS) directive, battery directive, polymer recycling codes, packaging directives, eco-labelling, Mobius Loop, European Eco-label, EC energy label, Energy Efficient label and logo, FSC, EPA energy star. <u>Skills:</u> Product analysis, specification build, Iterative design task. <u>Materials research and Experimentation:</u> Timber research, stress testing. <u>Ikea Disassembly</u> <u>Knowledge:</u> Ikea ethos, Design for manufacturing, maintenance, repair and disposal, Socio economic influences, Social, moral and ethical issues, Product life cycle, Responsible design, Environmental issues. <u>Skills:</u> Practical disassembly, Knockdown fittings.	<u>Angle Poise Light</u> <u>Knowledge:</u> Designers and their work, Digital design and manufacture, Virtual modelling, Prototypes, 3D printing, Papers & Boards overview and finishes, Smart Materials, Nano Materials, Material enhancements, Anthropometric Data, Ergonomics, Biomimicry, Sustainability, Circular Economy, 6Rs, Planned Obsolescence, Orthographic, Sectional drawings, Digital design and manufacture, Virtual modelling. <u>Skills:</u> Design Communication, data analysis, design strategies SCAMPER, testing through Card Modelling & CAD	<u>Angle Poise Light</u> <u>Continued</u> <u>Knowledge:</u> Metals Overview, Physical and Mechanical properties, Permanent & temporary Joining methods Sustainability, Design for Manufacture, Modern Industrial Practices, Scale of production, Justin time, One off, Mass, Continuous, COSH, HASAWA, QA/QC, RIDDOR, H&S. <u>Skills:</u> Manufacturing specification, Plan of making., Manufacturing log, realise final design, Electronics, CAD/CAM, 3D printing, Maths skills. <u>Dyson Foundation Engineering box.</u> <u>Design from the inside out</u> <u>Knowledge:</u> Commercial manufacture, Engineering roles. <u>Skills:</u> Disassemble and reassemble Dyson V12 parts, product analysis	<u>A Level NEA (Non Exam Assessment)</u> Knowledge: Section A: Client research and investigation, Market research, Client & Biomimicry Mood Board, identify and explore possible client problems. Skills: Presentation and communication Exam skills practice
	Assessment	Verbal and formative feedback. Self-evaluation and assessment Practical assessment	Verbal and formative feedback. Self-evaluation and assessment Practical assessment	Mock exam	Verbal and formative feedback. Self-evaluation and assessment Practical assessment	Verbal and formative feedback. Self-evaluation and assessment Practical assessment	Mock exam paper1 & 2
13	Knowledge and Skills	<u>NEA Section A – Investigation</u> <u>Section B - Design brief and Specification</u> Students will complete section A of NEA. This includes Gantt Chart, Plan of research, Client research and investigation, Market research, Client & Biomimicry Mood Board, Exploring possible Client problems, Disassembly,	<u>NEA Section D - Developing Design prototypes</u> Design strategies, Product analysis, 2D and 3D design communication, Environmental and social impact, Anthropometrics and ergonomics, Material research, Joining methods research, Design development. 3D design development, testing through card modelling.	<u>NEA Section E – Realising design ideas</u> Manufacturing specification, Plan of making., Manufacturing log, Realise final design. Retrieval practice	<u>Section F – Testing and evaluating.</u> Final product completed. Testing and critical valuation of final prototype, identifying how modifications could be made to improve outcome. Retrieval practice	<u>Final checks for NEA</u> NEA completed, Final photographs of products taken, NEA portfolios sent to Moderator. Retrieval practice and exam preparation	<u>Exam 5th & 12th June TBC</u>

		First concepts, Design Brief, Design Specification. <u>NEA Section C – Generating design ideas</u> Development of innovative design proposals, Practical Investigation, Generating Design Ideas.	Retrieval practice				
	Assessment	Verbal and formative feedback. Self-evaluation and assessment	50% NEA Sections A, B, C, D Mock exam 1	50% NEA Sections A, B, C, D, E	50% NEA Sections A, B, C, D, E and F 50% Mock exam 2	50% NEA & Product	50% Paper 1 Technical principles, 2hrs Paper 2 Designing principles 1.5hrs