



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY

Design and Technology at KS3 is taught in a carousel system that covers product design, textiles and cooking & nutrition.

Key: C- Core Content for all GCSE, SP- Specialist Papers and Boards, ST- Specialist Timbers, TP- Technical principles, DMP- Designing and Making Principles

Knowledge & Concepts increase students depth/ challenge and build on previous learning where topics are revisited throughout their learning journey

		Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13
Half Term 1	Topics (overview)	Topics organisation 1.The Design process 2.Designing and making 3. Designing without making 4. Making without designing 5. Maths in Design and Technology 6. Technical knowledge	Topics organisation 1.The Design process 2.Designing and making 3. Designing without making 4. Making without designing 5. Maths in Design and Technology 6. Technical knowledge	Topics organisation 1.The Design process 2.Designing and making 3. Designing without making 4. Making without designing 5. Maths in Design and Technology 6. Technical knowledge	C1.17 Develop, communicate, record and justify design ideas, applying suitable techniques (1.17) C1.12 Categorisation of the types, properties and structure of natural and manufactured timbers (1.12) ST7.6 Manufacturing processes in timber (7.6) or SP3.6 Alternative manufacturing processes for different scales of production in papers and boards (3.6) <u>Practical:</u> 1. All: Drawing skills 2. Timbers – joints – storage unit	C1.4 Modern and smart materials, composite materials and technical textiles (1.4) C1.17 (Recap) Develop, communicate, record and justify design ideas, applying suitable techniques (1.17)	1. Design processes (DMP) 2. Critical analysis and evaluation (DMP) 3. Materials and their applications (TP) 4. Performance characteristics of materials. (TP)	1. National and international standards in product design (A-level specific) (DMP) 2. Performance characteristics of materials (A-level specific) (TP) 3. Forming, redistribution and addition processes (A-level specific) (TP) 4. Digital design and manufacture (TP) 5. Selecting appropriate tools, equipment and processes (A-level specific) (DMP) 6. Non-exam assessment



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



					<p>3. Papers and boards – Styrofoam perfume packaging.</p> <p>4. All: CAD/CAM 2D Design and cut decorations from laser cutter</p>			
Knowledge and skills (overview)	<p>1. Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion</p> <p>2. Consider the influence of a range of lifestyle factors and consumer choices when designing products</p> <p>3. Take creative risks when making design decisions</p> <p>4. Consider additional factors such as ergonomics, anthropometrics or dietary needs</p> <p>5. analyse where human values may</p>	<p>12. How to use date-mark and storage instructions when storing and using food and drinks CNB 12 - how to select and prepare ingredients CNB</p> <p>13. How to use utensils and electrical equipment</p> <p>15. How to apply heat in different ways</p> <p>14. How to use taste, texture and smell to decide how to season dishes and combine ingredients</p> <p>15. How to adapt and use their own recipes</p> <p>116. How to cook a repertoire of predominantly savoury dishes to feed themselves and others</p> <p>a healthy and varied diet</p>	<p>25. Allow procedures for safety and hygiene and understand the process of risk assessment</p> <p>use a wider, more complex range of materials, components and ingredients, taking into account their properties</p> <p>26. Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely</p> <p>27. Exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision</p> <p>28. Apply a range of finishing techniques, including those from</p>	<p>C. 1.17</p> <p>1.How the following techniques are used in communication of design ideas – freehand sketching, digital photography/media, cut and paste techniques, 3D models, 3D drawing, oblique and isometric projections, perspective drawing, orthographic and exploded views, assembly drawings, systems and schematic diagrams, computer aided design and specialist programs, record and justify design ideas clearly.</p> <p>C: 1.12</p> <p>1.Description, advantages, disadvantages and</p>	<p>C1.4</p> <p>1. Description, applications, advantages and disadvantages of SMAs, nanomaterials, photochromic glass, reactive glass, piezoelectric materials, temperature responsive polymers, conductive inks, concrete, plywood, fibre/carbon glass, reinforced polymers, robotic materials, agrotextiles, geotextiles, construction textiles, domestic, sports environmentally friendly, and protective textiles.</p> <p>C1.17 How the following techniques are used in communication of</p>	<p>1. Major developments in technology</p> <p>Social, Moral and ethical issues</p> <p>Product life cycle</p> <p>2. the use of the design process in the NEA</p> <p>prototype development</p> <p>3. Critical analysis and evaluation</p> <p>TP Component</p> <p>1. Mechanical and physical properties of materials.</p> <p>2. Materials classification</p> <p>3. Destructive and non-destructive Industrial and workshop materials testing processes</p> <p>4. Wood seasoning</p> <p>Toxicity of woods</p>	<p>1.Agencies –BSI/ ISO, Legislation- ROHS/WEEE, Eco labelling</p> <p>2. Papers and boards and boards processes</p> <p>- Woods and woods processes- steam bending, machining qualities, moisture resistance, toxicity</p> <p>- Metals and metal processes: Polymers and polymer processes.</p> <p>- Application and uses: Elastomers Biodegradable Polymers, suitability, composites and smart materials</p> <p>3. selecting the correct tools and equipment, safe</p>	



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		<p>conflict and compromise has been achieved.</p> <p>6. Select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture</p> <p>7. Select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness</p> <p>8. test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups.</p> <p>9. Know that food is produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade</p>	<p>17. Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations</p> <p>18. Combine ideas from a variety of sources</p> <p>19. Use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses</p> <p>20. Decide which design criteria clash and determine which should take priority</p> <p>21. Develop and communicate design ideas using annotated sketches</p> <p>22. Produce 3D models to develop and communicate ideas</p> <p>23. Use mathematical modelling to indicate likely performance before using physical materials and components, for instance when</p>	<p>art and design, to a broad range of materials including textiles, metals, polymers and woods</p> <p>29. Use learning from science to help design and make products that work</p> <p>30. Use learning from mathematics to help design and make products that work</p> <p>31. Understand the properties of materials, including smart materials, and how they can be used to advantage</p> <p>32. Understand the performance of structural elements to achieve functioning solutions</p> <p>33. Understand how more advanced mechanical systems used in their products enable changes in movement and force</p> <p>34. Competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment</p>	<p>common uses of oak, mahogany, beech, balsa, pine, cedar, plywood, and MDF.</p> <p>ST. 7.6</p> <p>1. Processes to cut and shape materials- routing, sawing, use of mortiser, use of a bag press</p> <p>2. scales of production- one-off, batch, mass and continuous</p> <p>3. techniques for quantity production- marking out methods, jigs, fixtures, templates, patterns, sub-assembly, CAM, quality control, working with tolerance, efficient cutting to minimise waste</p> <p>SP 3.6. 1. Printing- digital printing, photocopying, letterpress, offset printing, lithography, gravure, screen printing, other processes</p> <p>2. scales of production- one-off,</p>	<p>design ideas – freehand sketching, digital photography/media, cut and paste techniques, 3D models, 3D drawing, oblique and isometric projections, perspective drawing, orthographic and exploded views, assembly drawings, systems and schematic diagrams, computer aided design and specialist programs, record and justify design ideas clearly.</p>	<p>Stock forms, properties and uses of woods, metals, polymers, biodegradable polymers, composites, smart materials and modern materials</p>	<p>working practices in a workshop situation, maintaining safety in commercial manufacture, development of designs from single prototypes to mass produced products, production methods.</p> <p>4. Good and safe working practice</p>
--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		<p>10. Know that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion</p> <p>11. How to store, prepare and cook food safely and hygienically</p>	<p>developing circuits or gearing systems</p> <p>24. Give oral and digital presentations and use computer-based tools</p>		<p>batch, mass, continuous</p> <p>3. techniques for quantity production- marking out methods, fixtures, jigs for holding, templates and patterns, stencils, CAM, quality control, working with tolerance and efficient cutting</p>			
		Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13
Half Term 2	Topics	<p><u>Product Design– Jewellery</u></p> <p>1.Pupils work on a design and make task enhancing: research, 2. Designing, development of design ideas, evaluation, analysis, modelling,</p>	<p><u>Product Design – storage unit/light</u></p> <p>1.Design process 2. Expand practical skills including wasting processes, cutting and shaping wood, using jointing methods, fitting a hinge, etc.</p>	<p><u>Bedroom interior design project - graphics</u></p> <p>1. Design process 2. Materials – cardboard, Styrofoam, corrugated cardboard, foamboard, different grades of paper,</p>	<p>C1.1 The impact of new and emerging technologies. (1.1) C1.5 Mechanical devices used to produce movements (1.5) SP3.2. Sources of paper and boards</p>	<p>C1.13 1.Using materials, components and processes to inform outcomes C1.6. Electronic systems- including sensors and control</p>	<p>1.Responsible design (DMP) 2. Design for manufacture (DMP) 3. Enhancement of materials (TP) 4. Design methods and processes (DMP) 5. Design theory (DMP)</p>	<p>1.The use of finishes (A-level specific) (TP) 2. Modern and industrial commercial practice (A-level specific) (TP) 3. Digital design and manufacture</p>



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		<p>3. Making measuring and marking out accurately, wasting processes (cutting, sanding, filing, drilling), redistribution processes, finishing processes and using CAD/CAM.</p> <p>4. Packaging design – making nets using CAD/CAM</p> <p>5. How to classify materials – metals, manufactured boards,</p> <p>5. Evaluating – existing products – positive and negative impact that products can have in the wider world, own work</p> <p>6. Testing – against specification, others testing their work</p>	<p>3. Develop graphical elements for designing</p> <p>4. ICT and Techsoft2D – CAD/CAM.</p> <p>5. How to classify materials – metals, manufactured boards,</p> <p>5. Evaluating – existing products – positive and negative impact that products can have in the wider world, own work</p> <p>6. Testing – against specification, others testing their work</p>	<p>softwoods, hardwoods, manufactured timber</p> <p>3. Drawing equipment – try-squares,</p> <p>4. Processes and techniques involving working papers and boards – jigs for folding, punching, forces and stresses, cutting by hands, cutting with machinery, templates and patterns, stencils, CAD/CAM, cutting mats, safety rulers, craft knives,</p> <p>5. How to classify materials – metals, manufactured boards,</p> <p>6. Evaluating – existing products – positive and negative impact that products can have in the wider world, own work</p> <p>7. Testing – against specification, others testing their work</p>	<p>ST7.2. Sources of timber</p> <p>Practical:</p> <p>1. Mechanical toys, gears, pulleys, levers.</p> <p>2. Packaging for the mechanical toy. Blister packaging or a packaging with a window or no use of polymer window</p>	<p>devices to respond to a variety of inputs, and devices to produce a range of outputs (1.6)</p> <p>C1.7 Programmable components (1.7)</p> <p>SP3.7. Specialist techniques used for high quality paper and board prototypes (3.7) or</p> <p>ST7.7. equipment and processes used to make prototypes in timber (7.7)</p> <p>SP3.1 Design contexts Component 2 Non-exam assessment (NEA)</p> <p>ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)</p>	<p>6. Technology and cultural changes (DMP)</p>	<p>(A-level specific) (TP)</p> <p>4. Accuracy in design and manufacture (DMP)</p> <p>5. Non-exam assessment</p>
	<p>Knowledge and skills</p>	<p>1. Research skills – product analysis, surveys, questionnaires, analysis of research,</p>	<p>1. Design process – design context and design brief</p> <p>2. Research skills – surveys, product</p>	<p>1. Design process: Design context/Situation/Design Brief.</p> <p>2. Analysing a range of existing/past products</p>	<p>C1.1. Understand</p> <p>1. Industry- demographic movement</p> <p>c. Enterprise- crowd funding, privately</p>	<p>C1.13</p> <p>1.Using materials, components and processes to inform outcomes – properties of</p>	<p>1. Environmental issues</p> <p>How products are designed to conserve energy, materials and components</p>	<p>1. Polymer finishing, Acrylic spray paints, Thermoplastic elastomer (TPE), Metal finishing-</p>



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



	<p>2 Writing a design brief and a design specification</p> <p>3 Presentation of design ideas – design communication skills. Produce ordered sequences and schedules for manufacturing products</p> <p>4. Follow procedures for safety and understand risk assessment</p> <p>5. Use a complex range of materials considering their properties</p> <p>6. Make use of specialist equipment to mark out materials</p> <p>7. Wasting process – filing, cutting, drilling and sanding</p> <p>8. Redistribution process – pewter casting</p> <p>9. Apply a range of finishing techniques, including those from art & design, polymers and woods.</p> <p>10. Anthropometrics and ergonomics – hand measurements</p>	<p>analysis, product disassembly,</p> <p>3. Understand how products contribute to lifestyle choices.</p> <p>4. Develop understanding of designing and manufacture.</p> <p>5. Identify and solve their own design problems and to reformulate those given to them.</p> <p>6. Writing a design specification</p> <p>7. Identify and write user needs</p> <p>8. Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations.</p> <p>9. Use learning from mathematics to design and make products that work. Include volume, area and costings</p> <p>10. Design communication – perspective drawing exploded and orthographic</p>	<p>using descriptive terminology.</p> <p>3. Exploring the history of hand-held games consoles; visual history and technology.</p> <p>4. Developing a brand identity.</p> <p>5. Developing a range of different design ideas; critically evaluating design concepts.</p> <p>6. Communication skills-rendering, 3D drawing (isometric and perspective)</p> <p>7. Making skills – wasting away, finishing</p> <p>8. Papers and boards – differences, stock forms, printing methods</p> <p>9. Considering life cycle analysis</p> <p>10. How products can be developed considering the concept of ‘cradle to grave’</p> <p>11. the concept of circular economy approaches in relation to product development and consumption</p>	<p>owned businesses, government funding</p> <p>3. sustainability-</p> <p>4. People- workforce, consumers</p> <p>5. Culture-population movement within EU, social segregation</p> <p>6. Society- change in working hours, internet of things, video conference meetings</p> <p>7. Environment-pollution, waste disposal, materials separation, transportation of and packaging of goods.</p> <p>8. Production techniques and systems (1.1)</p> <p>C 1.5</p> <p>1.Types of movement, classification of levers, linkages, cams, followers, pulleys and belts, cranks and sliders, gears, (1.5)</p> <p>SP3.2</p> <p>1.Paper, board and packaging laminate – calculating weight</p> <p>2. know the description,</p>	<p>materials and components, justifying materials, components and manufacturing processes.</p> <p>C1.6 (Revision)</p> <p>1.Sensors, control devices and components, outputs.</p> <p>C1.7</p> <p>1. How to make flowcharts.</p> <p>2. Inputs and decisions: switching outputs on or off</p> <p>3. How to process and respond to analogue inputs</p> <p>4. How to use simple routines to control outputs</p> <p>SP3.7 Paper and Board: tools and equipment- hand tools, shaping, fabricating/ assembling/ constructing and binding</p> <p>ST7.7. Tools and equipment, shaping, -cutting,</p>	<p>The reuse of material off cuts, chemicals, heat and water</p> <p>2. Planning for accuracy and efficiency</p> <p>Accuracy in scale production</p> <p>Quality assurance go/no-go gauges</p> <p>Laser scanning and measuring non-destructive testing.</p> <p>3. Polymer enhancement</p> <p>Wood enhancement</p> <p>Metal enhancement</p> <p>Paper and board forming processes</p> <p>4. Wood processes</p> <p>Joining methods, adhesives and fixings, coach bolts, milling.</p> <p>Polymer processes - joining methods, adhesives and fixings,</p> <p>Calendering</p> <p>Metal processes</p> <p>5. Paper and board finishing</p> <p>6. Historical design styles, design movements and influential designers</p> <p>Development of designs from prototype to mass produced product</p> <p>7.Iterative design process</p>	<p>sealants, preservatives, anodising, plating, coating, cathodic protection.</p> <p>Wood finishing- colour wash, Danish oil</p> <p>2. Scales of production-unit production systems (UPS), quick response manufacturing (QRM), vertical in-house production</p> <p>3. The use of computer system: modular production, cell production, flexible manufacturing systems (FMS). DDM: Computer aided design (CAD), Computer aided manufacture (CAM)</p> <p>4. Importance of accuracy in manufacture</p>
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		<p>11. Metals – their classification and properties.</p> <p>12. Materials – Softwoods, hardwoods and manufactured boards – examples (pine, oak, MDF) and properties</p> <p>13. Packaging design skills – scoring, bending, construction of nets, applying surface graphics</p> <p>14. Packaging knowledge – net development, brand identity, logos,</p> <p>15. Use 2D and begin to use 3D CAD packages to model their ideas</p>	<p>11. Manufacturing – select and safely use tools and equipment in a design and technology workshop.</p> <p>12. Evaluation – own work as it develops and those of others</p> <p>13. Resistors – function and calculation of resistance in ohms.</p> <p>14. Input, process and output components</p> <p>15. Classification of materials woods – softwoods and hardwoods – pine, oak, teak</p>	<p>12. make simple use of planning tools, for instance Gant charts</p> <p>13. Produce models of their ideas using CAD/CAM to test out their ideas</p>	<p>advantages and disadvantages of the following materials: bond paper, hat transfer printing paper, foil-lined board, packaging laminate – Tetra Pak, paperboard and aluminium foil.</p> <p>3. sources and origins of paper and board.</p> <p>4. working properties of papers and boards.</p> <p>5. Social footprint –</p> <p>6. Ecological footprint</p> <p>SP7.2 Sources of timber</p> <p>1. Natural timbers – hardwoods, softwoods, manufactured timber.</p> <p>2. Sources and origins of timber.</p> <p>3. Physical characteristics of timber</p> <p>4. working properties</p> <p>5. Social footprint</p> <p>6. Ecological foot print</p>	<p>planning, chiselling, turning, abrading, curving</p> <p>Fabricating and constructing, wasting, addition, assembling</p> <p>SP3.1 Design contexts</p> <p>Component 2 Non-exam assessment (NEA)</p> <p>ST7.1 Design contexts:</p> <p>Component 2 Non-exam assessment (NEA)</p>	<p>User centred design</p> <p>8. Design influences</p> <p>Designers and their work</p> <p>Design styles and movements</p> <p>Key historical design styles, Design movements Influential designers</p> <p>Socio economic influences</p>	
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13
Half Term 3	Topics	<u>Textiles</u> Soft Toys - Use of artist research to influence design ideas - Planning making a soft toy - Pattern cutting for a purpose -hand embroidery as a means of decoration	<u>Textiles</u> Fabric box -classification of fabric - natural, synthetic and smart materials -Repeat patterns identification -designing repeat patterns with purpose -Researching existing products -discussing function VS aesthetics -Printing for purpose (stencil printing and/or block and tie and dye printing) -hand embroidery -machine stitch	<u>Product design 2 – Game controller model</u> - Classification of polymers - Design process - Forming polymers - investigating the work of others - Health and safety	C1.10 Thermoforming and thermosetting polymers (1.10) C1.3 Energy generation, storage and choosing appropriate sources (1.3) Practical 1. All: Vacuum forming, 2.All: Line bending phone holder with acrylic – laser cutter 2D design v2	ST7.8 Surface treatment for functional and aesthetic purposes in timber or (7.8) SP3.8 Surface treatments and finishes for papers and boards (3.8) SP3.5 – stock forms (3.5) ST7.5 – Stock forms of timber (7.5) SP3.1 Design contexts Component 2 Non-exam assessment (NEA) ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)	1. Health and safety (TP) 2. Design for manufacturing, maintenance, repair and disposal (TP) 3. Enterprise and marketing in the development of products (TP) 4. Forming, redistribution and addition processes (TP) 5. NEA	1. Digital design and manufacture (A-level specific) (TP) 2. The requirements for product design and development (TP) 3. Protecting designs and intellectual property (TP) 4. Design for manufacturing, maintenance, repair and disposal (TP) 5. Feasibility studies (TP) 6. Enterprise and marketing in the development of products (TP) 7. Non-exam assessment



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



	Knowledge skills	<ol style="list-style-type: none"> 1. Develop the understanding of formal elements in textiles through design 2. develop refined ideas using annotated sketches 3. properties of materials and where these properties can be utilised 4. to work within a design brief 5. develop their understanding of designing and making and expand practical skills using hand embroidery 	<ol style="list-style-type: none"> 1. Develop the understanding of formal elements in Textiles through design 2. develop ideas using annotated sketches 3. properties of materials and where these properties can be utilised 4. work within a design brief 5. expand practical skills using hand embroidery and machine stitch 6. develop understanding of different types of repeat patterns 7. understanding of various printing methods; students will approach stencil printing and/or block printing and tie and die in more depth 	<ol style="list-style-type: none"> 1. Design process – design context, research – investigating existing products and the work of others, ergonomics and anthropometrics, design specification, design ideas and development, manufacturing plan, making skills – considering health and safety. 2. Polymers – thermoplastics and thermosetting – source, properties and application of acrylic, UF and HIPS 3. Manufacturing processes - Vacuum forming – draft angle, formers 4. Manufactured timbers – MDF properties, 5. Manufacturing processes – wasting, finishing on wood. 5. Brand identity – packaging for games – Packaging 	<p>C1.10</p> <ol style="list-style-type: none"> 1. Thermoforming polymers and thermosetting polymers – acrylic, HIPS, Biopol, polyester resin and UF their form, properties, common uses, advantages and disadvantages. (1.10) <p>C1.3</p> <ol style="list-style-type: none"> 1. How the following sources of energy: coal, oil, gas, biomass, biodiesel, tidal, wind and solar are converted into energy, their advantages and disadvantages. Power systems and choosing appropriate sources for products and power systems. (1.3) 	<p>SP3.8 Paper and boards- Surface finishes and treatments – varnishing and UV varnishes, hot foil blocking, edge staining, embossing, packaging laminates and films</p> <p>ST7.8 Timbers- surface finishes and treatments- painting, staining, varnishing, wax, oil, shellac, veneering</p> <p>SP3.5</p> <ol style="list-style-type: none"> 1. Stock forms/types 2. Sizes 3. Calculating area and diameter <p>ST7.5</p> <ol style="list-style-type: none"> 1. Stock forms/types 2. Sizes - PAR and PSE, cross-sectional area, diameter, board sizes <p>SP3.1 Design contexts</p> <p>Component 2 Non-</p>	<ol style="list-style-type: none"> 1. the legislation and agencies responsible for health and safety potential hazards in a school workshop 2. Manufacture, Repair, Disposal, reduction in the number of manufacturing processes, maintenance, ease of manufacture, disassembly. 3. Marketing and brand identity global marketing costings and profit 4. Forming, redistribution and addition process <p>Paper and board processes, Polymer processes, Metal processes- redistribution processes, Temporary fasteners and joining methods, Metal processes- wasting processes, Wood processes- addition and fabrication processes, Wood processes- wasting processes, Wood processes-</p>	<ol style="list-style-type: none"> 1. DDM: Virtual modelling, Rapid prototyping processes, How products are designed to conserve energy, materials and components, The reuse of material offcuts, chemicals, heat and water, Electronic data interchange, Production, planning and control network (PPC). 2. Product development and improvement, Fitness for purpose/accuracy of production, Aesthetics, ergonomics and anthropometrics when designing 3. Copyright, design rights, patents, registered designs, trademarks, LOGOS, 4. Manufacture – reducing the number of processes, Repair – Maintenance, Ease of manufacture – Disassembly 5. Explain the use of feasibility studies to assess the practicality for production.
--	------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



				design skills – scoring, bending, construction of nets, applying surface graphics 6. Anthropometrics – human measurements for improving product design		exam assessment (NEA) ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)	forming timber, The use of adhesives and fixings and adhesives.	6. The importance of marketing and brand identity.
		Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13
Half Term 4	Topics	Cooking and Nutrition – Adventure into food 1. Principles of good personal hygiene and safety. 2. Using the knife 3. Weighing and measuring 4. Using the cooker 5. Principles of Eatwell Guide	Cooking and Nutrition – Exploring food and nutrition 1.Principles of food hygiene and safety 2. Energy 3. Macro-nutrients 4. Micro-nutrients	Cooking and Nutrition – making choices 1.Principles of food hygiene and safety, 2.Diet changes in maintaining good health. 3. Needs of different cultural groups	C1.11 Categorisation of the types, properties and structure of natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles (1.11) C1.9 Categorisation of the types, properties and structure of papers and boards (1.9) SP3.4 – Forces and stresses	C1.13 Design and Technological practice SP (3.3) – Selection of papers and boards ST7.3 – Selection of timber (7.3) SP3.1 Design contexts Component 2 Non-exam assessment (NEA)	1. Design communication (TP) 2. Technology and cultural changes (A-level specific) (DMP) 3. Design processes – prototype development (A-level specific) (DMP) 4. Design processes (A-level specific) (DMP) – iterative design in commercial context 5. The use of finishes (TP) 6. NEA	1. Modern manufacturing systems (TP) 2. Detailed product study 3. Detailed product comparison 4. Detailed product analysis 5. Exam preparation – Exam technique (DMP) 6. Exam preparation – (TP) 7. Non-exam assessment



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



					<p>ST7.4 – Strengthening timber (7.4)</p> <p>Practical</p> <ol style="list-style-type: none"> 1. All 3D printing of parts 2. Timbers: Kitchen towel holder 3. Timbers: Hardwood phone stand laminated and one piece. 4. Papers and boards: Sports centre façade – with triangulation – with a bridge. 	<p>ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)</p>		
Knowledge and skills	<ol style="list-style-type: none"> 1. Know the standards of hygiene and safety in the school food kitchen. 2. Identify the hazards that can occur in a kitchen 3. Planning for practical lesson on knife skills 4. Bridge and claw technique whilst slicing and dicing. 5. Know the correct order for washing up. 6. Names and rules for the 	<ol style="list-style-type: none"> 1. Know why the body needs energy. 2. Implications of energy imbalance. 3. Calculating energy expenditure. 4. What is a healthy diet - daily calorie intake. 5. Function and sources of carbohydrates, proteins and fats. 6. Proportions and what forms the smallest slice of the NHS Eatwell Guide. 7. '5 a day' principle for fruit and vegetables. 8. Practical tasks 	<ol style="list-style-type: none"> 1. Knowledge on why we eat different foods. 2. Dietary needs through life and how they change. 3. The roles that food play in religion 4. Practical tasks <ul style="list-style-type: none"> - Garlic bread - Stir fry - Savoury tart - Pasta bolognaise. - Blondies 	<p>C.1.11</p> <ol style="list-style-type: none"> 1. Natural fibres- animal wool, plant cotton, 2. Synthetic fibres- polyester, acrylic 3. Woven textiles- plain weave-calico, twill weave-denim 4. Non-woven textiles- felted wool fabric, bonded fibres/webs 5. Knitted textiles- warp-knitted fabric, weft-knitted fabric <p>C1.9</p> <ol style="list-style-type: none"> 1. Paper – the description, uses, advantages and disadvantages of copier paper, cartridge 	<p>SP3.3</p> <p>Know the factors that affect selection of timber</p> <ol style="list-style-type: none"> 1. Aesthetic factors – form, colour, surface graphics and texture. 2. Environmental – sustainability, pollution and genetic engineering. 3. Availability factors – use of stock materials and specialist materials. 4. Cost factors – quality of material, decorative techniques, 	<ol style="list-style-type: none"> 1. Communication and presentation techniques used for conveying design proposals to clients 2. socio economic influences on product design and manufacture. 3. major developments in technology how the have shaped product design and manufacture. Social, moral and ethical responsibilities of a designer. The concept of product lifecycle. 4. CAD in industrial applications, virtual 	<ol style="list-style-type: none"> 1. How computer systems are used in modern manufacturing. Develop knowledge of specific industrial examples and their use in the manufacture of given products. 2. Identification of the materials used 3. Materials <ul style="list-style-type: none"> • Manufacturing process • Ergonomics • Suitability for the intended environment 	



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



		<p>weighing and measuring equipment.</p> <p>7. Know the parts of a cooker and how it works.</p> <p>8. Know where food comes from and why we eat food.</p> <p>9. Practical skills</p> <ul style="list-style-type: none"> - Dips and crudities - Scones - Apple crumble - Frittatas - Crisp goujons 	<ul style="list-style-type: none"> - Shortbread - Burgers - Pasta bake - Quick pizza - Apple cake 		<p>paper and tracing paper.</p> <p>2. Boards – the description, uses, advantages and disadvantages of folding boxboard, corrugated card and solid white board.</p> <p>3. Understand the description of the following properties – flexibility, printability and biodegradability.</p> <p>ST3.4</p> <p>1. Know the definition and applications to papers and boards of the following forces/stresses; bending, torsion, shear and compression.</p> <p>2. Reinforcement techniques – laminating, encapsulation, corrugated board, corrugated card, packaging laminates</p> <p>ST7.4</p> <p>1. Know the forces and stresses in timber: compression, tension and shear - Natural</p>	<p>manufacturing processes, commodity price and cost of recycling.</p> <p>5. Social factors</p> <p>6. Cultural and ethical factors – avoidance offence, suitability for intended market, use of colour and language, the consumer society, the effects of mass production, and built in obsolescence.</p> <p>ST7.3</p> <p>Know the factors that affect selection of timber</p> <p>1. Aesthetic factors – form, colour and texture.</p> <p>2. Environmental – sustainability, genetic engineering, seasoning and upcycling.</p> <p>3. Availability factors – use of stock materials and specialist materials,</p>	<p>modelling, rapid prototyping, electronic data exchange, production, planning and control networking (PPC)</p> <p>5. NEA: Prototype development. Discuss and implement a range of design processes</p> <p>6. The use of finishes</p> <p>Paper and board finishing, Paper and board printing processes, Polymer finishing, Metal finishing, Wood finishing</p>	
--	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



					<p>forces within the timber as it grows.</p> <p>2. Reinforcement and stiffening techniques – fabrication, assembly and construction processes; lamination, braces and tie bars and embedding composite materials.</p>	<p>hurricanes, storm and diseases..</p> <p>4. Cost factors – quality of material, manufacturing processes necessary, and treatments.</p> <p>5. Social factors – use for different social groups, and trends, fashion and popularity.</p> <p>6. Cultural and ethical factors</p> <p>SP3.1 Design contexts Component 2 Non-exam assessment (NEA)</p> <p>ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)</p>		
					Year 10	Year 11	Year 12	Year 13
Half Term 5	Topics				<p>C1.2 The critical evaluation of new and emerging technologies (1.2)</p> <p>C1.8 Categorisation of ferrous and non-ferrous metals (1.8)</p> <p>Practical</p>	Exam revision	<p>1. Design theory (A-level specific) (DMP)</p> <p>2. Responsible design (A-level specific) (DMP)</p> <p>3. Design for manufacture and project management (A-level specific) (DMP)</p>	<p>1. Exam preparation – (TP)</p> <p>2. Exam preparation – (DMP)</p>



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



					<ol style="list-style-type: none"> 1. Timbers: Laminated candle holder 2. Papers and boards: Promotional materials 		<ol style="list-style-type: none"> 4. Modern and industrial commercial practice (TP) 5. NEA 	
	Knowledge and skills				<p>C1.2</p> <ol style="list-style-type: none"> 1. Examples of critical evaluation questions 2. Critical evaluation examples 3. Portable power source for mobile hardware 4. Consideration of contemporary and potential future scenarios 5. Ethical perspectives on new and emerging technologies <p>C1.8</p> <ol style="list-style-type: none"> 1. The properties, uses, composition, melting point and examples of uses of the following ferrous metals mild steel, stainless steel and cast iron. 2. The properties, uses, composition, melting point and examples of uses of the following non-ferrous metals aluminium, copper and brass. 3. Understand the definition of the following metal properties; ductility and malleability and hardness 	Exam Revision	<ol style="list-style-type: none"> 1. The effect on the manufacturing process that is brought about by the need for batch and mass manufacture 2. Conservation of energy and resources How products are designed to conserve energy, materials and components The reuse of material offcuts, chemicals, heat and water. 3. Planning for accuracy and efficiency Quality assurance, Quality control, Go/no-go gauges, laser or probe scanning and measuring Non-destructive testing such as x-rays and ultrasound 	<ol style="list-style-type: none"> 1. •Focus here on the use of finishes <ul style="list-style-type: none"> •Modern industrial and commercial practice •Digital design and manufacture •Product design and development •Health and safety •Manufacture maintenance repair and disposal •Enterprise and marketing •Design communication • Focus here on protecting designs and intellectual property •Manufacture maintenance repair and disposal •Enterprise and marketing •Design communication •Modern manufacturing systems 2 •Focus here on design methods and processes



DESIGN & TECHNOLOGY CURRICULUM LEARNING JOURNEY



					Year 10	Year 11	Year 12	Year 13
Half Term 6	Topics				<p>C1.15. Investigate and analyse the work of past and present professionals and companies in order to inform design – (1.15)</p> <p>C1.14. Challenges that influence the process of design and making. (1.14)</p> <p>C1.16 Use of different design strategies</p> <p>SP3.1 Design contexts Component 2 Non-exam assessment (NEA)</p> <p>ST7.1 Design contexts: Component 2 Non-exam assessment (NEA)</p>	Exam techniques and revision on a range of topics	<p>1. Product design and development (TP)</p> <p>2. NEA</p>	<p>1. Exam preparation – (TP and DMP)</p> <p>2. External exams (Paper 1 and 2)</p>
	Knowledge and skills				<p>C1.14</p> <ol style="list-style-type: none"> 1. Respect for different social, ethnic and economic groups. 2. Environmental, social and economic issues, relating to the design and manufacture of products. 3. Consideration of green designs. 4. Human capability. 5. Cost of materials. 6. Manufacturing capability. 7. Environmental impact -life-cycle analysis <p>C1.15</p> <ol style="list-style-type: none"> 1. Analysing a product to specification criteria 2. The work of Alessi, Apple, Heatherwick Studio, Joe-Casely Hayford, Pixar, Raymond Loewy, Tesla and Zaha Hadid – C3. Analysing a product specification criteria. <p>C1.16</p> <ol style="list-style-type: none"> 1. Collaboration 2. User-centred design 3. Systems thinking <p>Component 2 NEA related skills</p> <ul style="list-style-type: none"> - Exploring the contextual challenge - Research skills – questionnaires, surveys, product analysis, - Writing a design brief - Writing a design specification - Communicating design ideas 		<p>1. Product development fitness for purpose, accuracy of production, consideration of aesthetics, ergonomics and anthropometrics</p> <p>2. NEA related skills</p> <ul style="list-style-type: none"> - Communication of design ideas - Development of design ideas - Modelling design ideas 	