

Design Technology

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		Term1				Term2				Term3			
		Term 1.1		Term 1.2		Term 2.1		Term 2.2		Term 3.1		Term 3.2	
7	Theme	BOX & Jewellery Project.						Steady Hand Game					
	Concept	Research	Materials	Power/energy	Design	Systems/control	Manufacture	Research	Materials	Power/energy	Design	Systems/control	Manufacture
	Skills Knowledge	<p>Research</p> <ul style="list-style-type: none"> Understanding how to carry out a product analysis and the importance of looking at existing products. An introduction in ACCESSFM. <p>Materials</p> <ul style="list-style-type: none"> Understanding how to work with natural and manufactured timbers, machine & hand tools Natural & Manufactured Timber Sources, origin, Types, Conversion, Working properties, Surface finishes <p>Design</p> <ul style="list-style-type: none"> Isometric Drawing – key rules of isometric drawing 30 degree angles and the importance of parallel lines Design Strategies/Communication of ideas – Understand what rendering is and how it improves how the design is viewed Evaluation & Analysis – Evaluate and analyse existing products, be able to critically evaluate their ideas and choose the best design to manufacture. Work of others – art influence – Understand the different important art movements of the past and be able to identify key features and use to create Pewter jewellery design ideas. Design concept- creating a mould – Pupils to be able convert a design into a potential pewter mould in readiness for creating on 2D design CAD/CAM –2D design /Laser cutting <p>Manufacture</p> <p>Plywood Box</p> <ul style="list-style-type: none"> Use of power machinery and hand tools (hegner saw, tenon saw, sander, benchdrill) High quality making—accuracy with measurements & tools (tri square, rulers, jigs) Tolerances & Cutting & Shaping wood <p>Jewellery</p> <ul style="list-style-type: none"> Understanding Pewter casting and practicing pewter casting Understanding how to work with metals – files, cutting, shaping polishing Working properties, Surface finishes of Pewter Tolerances & Casting Metal 						<p>Research</p> <ul style="list-style-type: none"> Understanding how to carry out a product analysis and the importance of looking at existing products. An introduction in ACCESSFM. <p>Materials</p> <ul style="list-style-type: none"> Plastics properties – Thermo & Thermosetting – What are the differences between the two, where do plastics come from? <p>Power an Energy</p> <ul style="list-style-type: none"> Energy Generation & Storage – Renewable & Non Renewable energy, Batteries, Nuclear power , Environmental impact, advantages and disadvantages of using renewable and non renewable energy. <p>Design</p> <ul style="list-style-type: none"> Design Strategies/Communication of ideas – Produce a variety of design ideas for the SHG and learning how to avoid design fixation Evaluation & Analysis – Understand how to evaluate design ideas to help select the most appropriate design to manufacture. Understand how to present design ideas including the importance of annotation. <p>Systems/Control</p> <ul style="list-style-type: none"> Understanding simple circuits, components, current, buzzers and switches. Be able to name and identify specific electronic components and explain their use in a circuit <p>Manufacture</p> <ul style="list-style-type: none"> Soldering, how to use the soldering iron safely and accurately to join the resistor, capacitor, transistor, battery snap and buzzer to the circuit. Use of Jigs, power machinery and hand tools (hegner saw, coping saw, sander, drilling machine) Plastic Press forming - High quality making—accuracy with measurements & tools (tri square, rulers, jigs) Manipulation of materials – pliers Two and three dimensional work— hand drawn design ideas 					
Wider Curriculum	<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – industry, deforestation & timber usage Industry & Real world jobs Maths – accurately measure, Isometric, 2D to 3D conversion Literacy – Analytical writing CAD/CAM use of computer software – saving, finding images on internet and use of desktops 						<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – industry, electronics, batteries, Geography – energy storage & generation Computer Science – inputs, processes & outputs, processors Industry & Real world jobs Maths – accurately measure, 2D to 3D conversion Literacy – Analytical writing CAD/CAM use of computer software – saving, finding images on internet and use of desktops 						

8	Theme	CAM TOY						Bug Toy – Engineering Project					
	Concept	Research	Materials	Power/energ	Design	Systems/control	Manufacture	Research	Materials	Power/energ	Design	Systems/control	Manufacture
	Skills Knowledge	<p>Research Product Analysis – Understanding the importance of looking at the work of others and carrying out detailed analysis which can help inform their own ideas. Using ACCESSFM to analyse work and give opinions on positive and negatives of the design.</p> <p>Materials</p> <ul style="list-style-type: none"> Material properties, Reinforcing materials, Commercially available types and sizes of materials and components. Timber & manufactured boards – properties, sources and uses – Retrieval of knowledge from year 7 plywood box project. <p>Design</p> <ul style="list-style-type: none"> Understanding the importance of producing detailed design ideas including annotation Design Strategies/Communication of ideas – including 2D, 3D sketching and use of colour to add detail to work. Evaluation & Analysis – To be able to critically evaluate designs to help make informed decisions on which idea to take forward and manufacture. <p>Systems and control</p> <ul style="list-style-type: none"> Mechanical Devices: Different types of movement – Reciprocating, Linear, Oscillating and rotary motion – how do they link to the CAM toy they are design and making. Changing magnitude and direction of force: CAMs and Followers, Levers, Linkages, Bell cranks, Push/Pull, Rotary Systems, Simple Gears <p>Manufacture</p> <ul style="list-style-type: none"> Use of power machinery and hand tools (hegner saw, tenon saw, sander, benchdrill) High quality making—accuracy with measurements & tools (tri square, rulers, jigs) Two and three dimensional work—isometric drawing/design ideas CAD/CAM – Producing background for the CAM toy using 2D design 						<p>Research Product Analysis – Understanding the importance of looking at the work of others and carrying out detailed analysis which can help inform their own ideas. Pupils to give well thought through opinions on the products and evaluate the effectiveness of the overall product.</p> <p>Materials</p> <ul style="list-style-type: none"> Metals & Alloys: Ferrous, Non Ferrous metals and alloys, what are the differences between them . properties, sources & origins, uses, <p>Power and Energy</p> <ul style="list-style-type: none"> Use of automation within technology & production techniques: Automation, CAD/CAM, <p>Design</p> <ul style="list-style-type: none"> Understanding the importance of producing detailed design ideas including annotation Design Strategies/Communication of ideas – Use of templates, colour to add detail to ideas. Evaluation & Analysis Biomimicry – Design strategies – examples of biomimicry and how it benefits designers and engineers, pupils to understand how we are using biomimicry in this project. <p>Systems and control</p> <ul style="list-style-type: none"> Mechanical Devices: Different types of movement Changing magnitude and direction of force: CAMs and Followers, Levers, Linkages, Bell cranks, Push/Pull, Rotary Systems, Simple Gears <p>Manufacture</p> <ul style="list-style-type: none"> Soldering accurately and safely, link back to SHG project – joining motor and battery Use of power machinery and hand tools (aviation snips, nibblers, metal sheet cutter, junior hacksaw, metal hole punch, spot welder, pliers, pop rivet) - pupils to learn how to use this equipment safely and accurately. Plastic Dip coating – How it is used in industry and in the classroom – Retrieval of knowledge on the importance of apply surface finishes to metals. High quality making—accuracy with measurements & tools (templates, engineers blue) Two and three dimensional work— hand drawn design ideas, CAD - Use of Techsoft 2D Design Joining materials – welding, soldering, rivets – permanent and semi-permanent methods. 					
Wider Curriculum	<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – industry, mechanisms, machinery Industry & Real world jobs Maths – accurately measure, 2D to 3D conversion Science – mechanisms, levers, pulleys Literacy – Analytical writing 						<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – industry, engineering, Industry & Real world jobs Maths – accurately measure, 2D to 3D conversion Science – Metals Literacy – Analytical writing CAD/CAM 						
9	Theme	Phone Stand						Mini Lamp					
	Concept	Research	Materials	Power/energ	Design	Systems/control	Manufacture	Research	Materials	Power/energ	Design	Systems/control	Manufacture
	Skills Knowledge	<p>Research Product Analysis – Understanding the importance of looking at the work of others and carrying out detailed analysis which can help inform their own ideas.</p> <ul style="list-style-type: none"> Use primary and secondary data to understand client and/or user needs. Market research, use of anthropometric & ergonomic data 						<p>Research</p> <ul style="list-style-type: none"> Product Analysis – Understanding the importance of looking at the work of others and carrying out detailed analysis which can help inform their own ideas. Research into causes of anxiety and lack of sleep in teenagers which links to the design and making of a mini lamp used on a bedside table. Use primary and secondary data to understand client and/or user needs. Market research, linked to product analysis, 					

		<p>Materials</p> <ul style="list-style-type: none"> Timber & Manufactured Boards - sources & origins (seasoning to reduce moisture content of timbers). Manufacturing methods & Processes : Prototype, batch, mass and continuous production runs. <p>Design</p> <ul style="list-style-type: none"> Understanding the importance of producing detailed design ideas including annotation Design Strategies/Communication of ideas. Prototype development/modelling. Two and three dimensional work— hand drawn design ideas, CAD - Use of Techsoft 2D Design Evaluation & Analysis <p>Manufacture</p> <ul style="list-style-type: none"> Use of power machinery and hand tools Timbers (hegner saw, benchdrill, router, disk sander/beltsander) Surfaces finishes – sanding seal High quality making—accuracy with measurements & tools (templates, prototypes, tri square, ruler, marking gauge) Marking out, cutting, shaping Timber joining methods, finishing techniques Use of CAD/CAM – Laser Cutter and 2D design 		<p>Materials</p> <ul style="list-style-type: none"> Polymers, their properties and uses – recap on what was learnt in Year 7 when pupils were introduced to polymers and additional knowledge on uses of polymers in the real world. Smart and modern materials – properties and uses- applying knowledge to a real-world scenario. <p>Design</p> <ul style="list-style-type: none"> Understanding the importance of producing detailed design ideas including annotation and colour Design Strategies/Communication of ideas. Two and three dimensional work including isometric sketching— hand drawn design ideas, CAD - Use of Techsoft 2D Design – contouring, filling, drawing with accuracy. Evaluation & Analysis to help make informed design decisions <p>Power and Energy</p> <ul style="list-style-type: none"> Sustainability and the Environment - FSC Carbon footprint – Use of fossil fuels compared with renewable energy <p>Systems and control</p> <ul style="list-style-type: none"> Research into electrical components. LED, Switch battery Input – Process – Output – Examples of each in the real world. <p>Manufacture</p> <ul style="list-style-type: none"> Use of power machinery and hand tools Timbers (hegner saw, benchdrill, router, disk sander/beltsander) Surfaces finishes – sanding seal – how and why it is applied. High quality making—accuracy with measurements & tools (templates, prototypes, tri square, ruler, marking gauge) Marking out, cutting, shaping Timber joining methods – Hlearn how to accurately manufacture a finger joint for the plywood case. Use of CAD/CAM – Laser Cutter and 2D design Soldering simple circuit using a LED, Swich, wires and battery accurately and safely. 			
	Wider Curriculum	<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – industry, deforestation, timbers, FSC Industry & Real world jobs Maths – accurately measure, 2D to 3D conversion, anthropometrics, graphical data Geography – deforestation & conversion of timbers Science – Anthropometrics Literacy – Analytical writing CAD/CAM – laser cutting 		<ul style="list-style-type: none"> Design & Make skills Hand eye coordination & Motor skills Research & Analytical skills Understanding of environment & real world – inclusive design, prototypes Industry & Real world jobs Maths – accurately measure, 2D to 3D conversion, anthropometrics, graphical data Literacy – Analytical writing CAD/CAM – laser cutting 			
10	Theme	Drawing Skills	Picture Frame Project		Lamp Project	NEA GCSE	
	Concept	Design & Make Principles	Specialist Technical Principles	Design & Make Principles	Specialist Technical Principles	Design & Make Principles	NEA
	Skills Knowledge	<p>Design & Making Principles (GCSE AQA): Communication of design ideas:</p> <p>Develop , communicate, record and justify design ideas using a range of appropriate techniques. Transferable skills to NEA & Exam.</p> <ul style="list-style-type: none"> Freehand sketching, isometric and perspective 2D and 3D drawings : isometric, orthographic, oblique, two point perspective 	<p>Core technical principles/Specialist technical principles:</p> <p>Timbers & Manufactured Board</p> <ul style="list-style-type: none"> Sources, origins, properties Working with timber based materials Commercial manufacturing, surface treatments and finishes. Ecological issues in the design and manufacture of products. Environmental issues: Deforestation, mining, drilling and farming. <p>Design & Make principles</p> <ul style="list-style-type: none"> Investigation into users needs and wants Creating a design brief & specification The environment, social and economic challenges that influence design and making. Generate imaginative and creative design ideas: iterative design, 	<p>Specialist technical principles:</p> <p>Metal based materials</p> <ul style="list-style-type: none"> Sources, origins, properties Working with metal based materials Commercial manufacturing, surface treatments and finishes. <p>Polymers:</p> <ul style="list-style-type: none"> Sources, origins, properties Working with polymer based materials Commercial manufacturing, surface treatments and finishes. <p>Core Technical Principles</p> <ul style="list-style-type: none"> Ecological & environmental issues <p>Systems & Control:</p> <ul style="list-style-type: none"> Inputs, processes and outputs 	<p>Beginning of GCSE NEA</p> <p>AO1 Identify, investigate and outline design possibilities</p> <ul style="list-style-type: none"> A Identifying & investigating design possibilities Context analysis x 3 Investigation of the problem Client and Target Market research Products analysis using ACCESSFM and 3 W's and a H. Pupils to be able to use PowerPoint/Publisher to 		

		<ul style="list-style-type: none"> - CAD design – including Sketchup & 2D Design 	<ul style="list-style-type: none"> - Modelling, Sketching - Evaluation of their work to improve outcomes - Identify steps within the design process—Product Analysis, <p>Timber & Manufactured board Marking out, cutting & shaping woods</p> <ul style="list-style-type: none"> - Tenon saw, hegner saw, tri square, disk sander, sand paper, coping saw, bench drill, jigs, chisel, files, CNC router - Joining methods – Timbers - Surface finishes 	<ul style="list-style-type: none"> - Energy generation & storage - Renewable and non-renewable energy. - Production techniques and systems: JIT, Batch, CAD/CAM, FMS <p>Design & Make principles</p> <ul style="list-style-type: none"> - Investigation into the work of others, past and present designers. - Polymers, Metals & Alloys, Systems & Controls - Marking out, cutting & shaping metals & polymers - CNC router, Tenon saw, hegner saw, tri square, disk sander, sand paper, coping saw, bench drill, jigs, chisel, files, laser cutter - CAD/CAM software – 2D design - Systems & Controls – circuit construction, soldering, soldering iron 	produce well presented and detailed digital NEA pages.	
	Wider Curriculum	<ul style="list-style-type: none"> - Maths – measure, mark out, isometric - Art – perspective drawing - Computer Science – use of CAD/CAM 	<ul style="list-style-type: none"> - Geography – Deforestation, Environmental impact of material choices - Maths – measure, mark out, volume & Wastage - Real world issues & Industry – job roles 	<ul style="list-style-type: none"> - Geography – metals, energy generation & Storage, nuclear power, renewable energy - Science – metals, plastics - Maths – mark & measure 2D to 3D designs - Computer Science – CAD/CAM 	<ul style="list-style-type: none"> - Design & Make skills - Hand eye coordination & Motor skills - Research & Analytical skills 	
	Theme	GCSE NEA		Revision/retrieval practice		
	Concept	NEA		Core Technical Principles	Specialist Technical principles	
11	Skills Knowledge	<p>NEA 2 A01 B Producing a design brief & specification</p> <ul style="list-style-type: none"> - Design Brief and initial sketches page – based on client’s needs and wants. - Specification using ACCESSFM – Must be measurable <p>A02 Design and make prototypes that are fit for purpose</p> <ul style="list-style-type: none"> - C Generating design ideas – 4/6 initial design ideas in pencil then 4 designs using CAD/Cardboard and traditional sketching techniques. - D Developing design ideas – Critically evaluate designs – develop chosen design using card and CAD, research materials, manufacturing methods, surface finishing and joining methods. Manufacturing specification produced based on fully developed design. - E Realising design ideas - Use workshop tools, machinery and CAD/CAM to manufacture working prototype of chosen design idea. Pupils to use QA/QC processes to aid accuracy of the product. <p>A03 Analyse and evaluate</p> <ul style="list-style-type: none"> - F Analysing & evaluating Test and evaluate final outcome against Design Brief and Specification – Pupils to critically evaluate final outcome and suggest modifications. 		<p>Core Technical Principles: New & Emerging Technologies:</p> <ul style="list-style-type: none"> - Industry & Enterprise - Sustainability & The environment - People Culture & Society - Informing design decisions <p>Energy Materials Systems and devices:</p> <ul style="list-style-type: none"> - Energy Generation - Energy Storage - Modern Materials - SMART Materials - Composite materials & Technical Textiles - Systems approach to design - Electronic systems processing - Mechanical Devices <p>Materials and working properties :</p> <ul style="list-style-type: none"> - Papers & Boards - Timbers - Metals - Polymers - Textiles <p>Specialist technical principles Common Specialist Technical Principles:</p> <ul style="list-style-type: none"> - Forces & Stresses - Improving Functionality - Ecological Social footprint - 6R's - Scales of Production - Timbers - Working Properties/Sources & Origins/Making Processes <p>Design & Making Designing Principles:</p> <ul style="list-style-type: none"> - Investigation Primary & Secondary Data - The work of others - Design Strategies <p>Making Principles:</p> <ul style="list-style-type: none"> - Communication of design ideas and prototype development - Selection of materials and components 		

Weekly homework's to be set based on exam pro and homework pack exam style questions. Knowledge organisers and BBC bitesize to be used by pupils to aid retrieval and revision.

			<ul style="list-style-type: none">- Tolerances & allowances- Material Management and marking out- Specialist tools equipment techniques and processes- Surface treatments and finishes
	Wider Curriculum	<ul style="list-style-type: none">- Design & Make skills- Hand eye coordination & Motor skills- Research & Analytical skills	