Year 8- Design and Technology

Topic	Rationale	Knowledge acquisition	Tasks - Notes	Key vocab	Skills and enrichment
Electronic Systems **Night Light**	This topic gives students the opportunity to acquire the required knowledge regarding specific materials and processes to manufacture a product. Timber will be the focus, covering categories, properties, sources and origins. Students will be given the opportunity to design a product (moneybox) and use workshop tools and equipment to manufacture their design. **Links to……** KS2. Possible material and practical investigations. KS3. Working safely in a workshop. Using inspiration for design ideas. The relevance of DT - Where materials come from **Ladders towards….** Material properties, selection and processing. Independent working in the workshop.	Lesson 1: To know how to use NEJE to analyse and evaluate existing products to inform design decisions.	Lamp analysis NEJE / ACCESSFM – sheets available Re-design lamp. Assessment and feedback on product analysis. Live marking opportunity	Analyse Explain Justify Evaluate	**Subject Specific Skills:** • Analysis - Name, Explain, Justify Evaluate (NEJE) • Ideas development • Graphical communication • Using workshop tools and equipment • CAD/CAM **Numeracy** • Measuring in MM • Use of grid in MM for isometric • Scale • Resistor values **Literacy** • Key vocab, meanings and context • Comprehension of instructions for processes **Cultural Capital** • Sources and origins of materials -impact (Social, moral, environmental. economical) • Past designers • Designing for purpose **Links to National Curriculum Design:** • use research and exploration to identify and understand user needs • identify and solve their own design problems and understand how to reformulate
		Lesson 2: To Know that research can be used to inform and inspire your own design ideas.	Design Brief – client Design ideas – use inspiration and make suitable for user / client. Work of others inspiration mats available Assessment and feedback on Design Ideas. Live marking opportunity	Research Inspire Create	
		Lesson 3: To know the requirements and purpose of a specification in the design process.	Formulate a specification for the example lamp.	Specification Client	
		Lesson 4 : To know that materials have particular properties that make them suitable for particular use	Match up the properties to materials and uses. Worksheet available. Nightlight homework 1	Material Category Property	
		Lesson 5: To know that timber comes from trees and how it is processed.	Homework misconceptions Stages involved in timber processing Seasoning Worksheet available Types of timber. Worksheet available	Origin Season PAR	

	Design development process. Assessment and feedback on product analysis. Live marking opportunity Moneybox homework 1 Homework misconceptions Assessment: Show you know 1. Assessment and feedback on Show you Know 1. Live marking opportunity		Assessment: Show you know 1. Assessment and feedback on Show you Know 1. Live marking opportunity		problems given to them develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • use a variety of approaches to generate creative ideas and avoid stereotypical responses • develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools **Make:** • select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture • select from and use a wider, more complex range of materials and Components taking into account their properties **Evaluate:** • analyse the work of past and present professionals and others to develop and broaden their understanding
		Lesson 6: To know how to identify, use and explain the use of common workshop tools. (requires4-6 lessons)	Diary of manufacture (optional task) Recap Health and Safety. Measure and mark out frame Disc sander for ends. Measure and mark out finger joint. Cut finger joint Assessment and feedback on practical. Live marking opportunity	Tenon Saw Try Square Bench Hook Finger Joint	
		Lesson 7: Know that CAD/CAM is an integral part of modern manufacturing and to know how to use it in school (computer room)	Recap of laser cutter and 2D design Recap Bitmap / vector from year 7. Create a series of suitable vectors – print screen and print for evidence. Choose one as final design Share the home use of 2D design with students Assessment and feedback on CAD. Live marking opportunity. Assessment: Show you know 2. Assessment and feedback on Show you Know 2. Live marking opportunity	CAD/CAM Laser Cutter Vector	

		Lesson 8: To know that an LDR is used to sense light in electronic circuits	Play your cards right – what do you already know? Class set of cards available Complete worksheet – red pen mark Repeat the game but this time with whiteboard and no cards.	LDR Transistor Resistor	• test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups • understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists **Technical knowledge:** • understand and use the properties of materials and the performance of structural elements to achieve functioning solutions • understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] • apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs
		Lesson 9: To know that a light sensing circuit can detect changes in conditions.	Recap components names and symbols Complete worksheet on sensing – use simulation to help. System block diagrams Resistor colour code chart Nightlight homework 2	Sense Resistance Switch Ohm	
		Lesson 10: To know how to assemble a PCB using the process of soldering. (3 – 4 lessons required)	Homework misconceptions Drill PCB (This should have been done in a previous lesson) H & S demo – build PCB Help guide available Assessment and feedback on PCB Building. Live marking opportunity. Assessment: Show you know 3. Assessment and feedback on Show you Know 3. Live marking opportunity	Solder Soldering Iron PCB	
		Lesson 11: To know how to use isometric paper to create presentation drawings.	Recap Isometric drawing from Year 7. Create nightlight presentation drawing using isometric techniques	Isometric Underlay Render	

			Recap rendering from Year 7. Apply render to drawing. Assessment and feedback on isometric drawing. Live marking opportunity		
		Lesson 12: To be able to recall all the stages included in making a Night Light (Optional)	Annotate isometric drawing with the stages involved in making the nightlight.	Identify Select Explain	
		Lesson 13: To know that testing is an important stage before final assembly of a product.	Assemble Nightlight Assessment and feedback on final product. Live marking opportunity Nightlight homework 2	Test Insulate Assemble	
		Lesson 14. To know that an evaluation is used to inform, reflect and develop outcomes throughout the design process	Homework misconceptions Complete final evaluation – worksheet available. Assessment and feedback on Project summary. Live marking opportunity	Test Evaluate Modify	