

Year 10 Long Term Plan: Design Technology

(Teacher One - NEA Focus)

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Anticipated misconceptions	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Storage Tray Project - Design	<p>Developing technologies in manufacturing</p> <p>Production techniques, including: CAD CAM FMS JIT</p> <p>How to draw in 1 point perspective</p>	<p>Brief and product analysis</p> <p>Drawing influence and inspiration from an existing designer</p> <p>Drawing on the work of established designers, brief analysis and their own ideas to produce a final design</p>	Students may confuse different production techniques, especially CAD vs CAM, so this will be made explicitly clear	Production of more complex designs in 1 point perspective.	<p>The economics, advantages and disadvantages of just in time manufacture in a modern democratic, capitalist society.</p> <p>The advantages and disadvantages of increasing automation</p>	<p>How technology has impacted the manufacturing sector.</p> <p>How the economy impacts manufacturing.</p> <p>Students will look at a number of different designers and their philosophies.</p>	<p>As an introductory unit, the groundwork for entry into a variety of production, design and manufacturing careers.</p> <p>In particular this unit will lay foundations for entry into design work, especially that which uses CAD/CAM.</p>
Two	Storage Tray Project - Manufacture	How to accurately measure in mm and cm	Fundamental measurement and woodworking	Students should already know how to convert from mm to cm and vice versa,	As a practical unit, there will be scope for more able students to produce	The use of anthropometric data and the importance of inclusive design to	By studying traditional wood-working joints, students will	This unit focuses on working with wood, and so would provide foundations

		<p>The correct manufacture and properties of the following joints: Comb Joint Half Lap Joint Mitre Joint Dowel Joint Housing Joint</p> <p>Use of anthropometric data to inform design choices</p> <p>The use of tenon and coping saws</p> <p>The use of pillar drills and belt sanders</p> <p>Orthographic Drawing Techniques</p>	<p>skills - Students will practically apply the knowledge they learn as outlined in the previous section of the plan.</p> <p>Students will carry out evaluation of their final product, and suggest design improvements</p>	<p>but this will be reinforced.</p> <p>The difference between a coping saw and a tenon saw</p>	a higher quality product, and potentially more complex manufacturing techniques.	ensure that products are accessible to all.	rediscover fading skills that will allow them to successfully complete DIY around their own homes in the future.	<p>for work in the joinery or construction trades.</p> <p>The use of manufacturer machinery such as the pillar drill and belt sander will also be applicable to a wide range of future careers in the technical and manufacturing sectors or any of the trades.</p>
Three	Lamp Project - Design	<p>The meaning and application of the following keywords:</p> <p>Cost Aesthetics Function Ergonomics Quality User Environment Materials Safety</p> <p>Use of lamination to produce transparent panels</p> <p>The importance of prototypes</p>	<p>Brief and product analysis</p> <p>Drawing influence and inspiration from an existing designer</p> <p>Drawing on the work of established designers, brief analysis and their own ideas to produce a final design</p>	<p>The uses of "Quality" and "Environment" in a design context rather than a general context.</p>	More able students will have the opportunity to produce more complex designs.	<p>The importance of health and safety of the end user when designing a product.</p> <p>The importance of considering the environmental impact of products.</p>	<p>Students will look at a number of different designers and their philosophies.</p> <p>The different approaches to producing economical and environmentally friendly designs.</p>	<p>This unit continues to build student's design skills and therefore continues to prepare them for entry into any product design oriented career.</p>

Four	Lamp Project - Manufacture	<p>The sources and properties of softwoods, hardwoods and manufactured boards.</p> <p>Properties and use of PVA and glass paper</p> <p>Properties and use of different wood finishes</p> <p>Resistors, LEDS, Switches and Stripboard</p> <p>Correct soldering technique</p>	<p>Students will practically apply the knowledge they learn as outlined in the previous section of the plan as they manufacture their product</p> <p>Students will carry out evaluation of their final product, and suggest design improvements</p>	<p>Students may confuse properties of hardwood and softwood and so this will be taught explicitly. This is something that is also addressed at KS3.</p> <p>The difference between current and potential difference.</p>	As a practical unit, there will be scope for more able students to produce a higher quality product, and potentially more complex manufacturing techniques.	The importance of using sustainable materials in manufacturing.	How ancient woodlands are sustainably managed to provide raw materials in the future.	<p>This unit continues to look at student's woodworking skills that would prepare them for future work in joinery or construction.</p> <p>Additionally, this unit builds on the electronics delivered at KS3, which lays the foundations for work in the electrical engineering or electronics sector.</p>
Five	Architecture Project - Design	<p>Modern Textiles and their working properties</p> <p>Two-point perspective drawing</p> <p>Thermosetting and thermosoftening polymers</p> <p>Use of CAD to reduce waste and improve efficiency of manufacture</p>	<p>Brief and product analysis</p> <p>Drawing influence and inspiration from an existing designer</p> <p>Drawing on the work of established designers, brief analysis and their own ideas to produce a final design</p>	Again, the differences between CAD vs CAM, as well as the links between them will be made explicit.	More able students will have the opportunity to produce more complex designs.	<p>The impact of plastic use in the modern world, and the arguments for and against its continued use.</p> <p>The impact, advantages and disadvantages of synthetic vs natural textiles</p>	How various polymers are produced, and the role of the oil industry in the economy. How a number of common textiles are produced.	<p>This unit continues to build student's design skills and therefore continues to prepare them for entry into any product design oriented career.</p> <p>It further advances student's readiness to enter careers that make use of CAD/CAM applications</p>

Six	Architecture Project - Manufacture	<p>Use of the laser cutter, and the appropriate use of the raster and vector settings</p> <p>Use of the vacuum former.</p> <p>Mechanisms, including: Hinges Pulles Cam and Follower</p> <p>Types of motion, including: Oscillating Rotary Linear Reciprocating</p>	<p>Students will practically apply the knowledge they learn as outlined in the previous section of the plan as they manufacture their product</p> <p>Students will carry out evaluation of their final product, and suggest design improvements</p>	The different types of motion could be easily confused, and so will need to be explicitly taught and practised.	As a practical unit, there will be scope for more able students to produce a higher quality product, and potentially more complex manufacturing techniques.	The impact, advantages and disadvantages of automation in the manufacturing sector.	Through study of this unit, students will gain a deeper appreciation of the simple and complex mechanisms around them everyday.	This unit lays the foundations for students to enter many careers within the construction and manufacturing industries, particularly through development of machining skills and study of mechanisms.
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