Year: 12 Subject: Product Design (DT)	**Curriculum Intent:** OCR Product Design specification for Design & Technology: Exam and NEA. The aim of the A-Level is to build and reinforce the skills both theoretical and practical that students would have learnt at GCSE. The tasks are set up to develop independent thought and to encourage self-reliance. Students will learn through a range of opportunities to employ their technical understanding and relate it to practical problems and solutions. One of the key differences of A-Level over GCSE is students are expected to demonstrate not just an understanding of theoretical practices but be able to question and evaluate their importance and need in the wider design context. This is building towards the students being able to choose an appropriate NEA project that will be carried through to Year 13. The broad strokes of the structure is based around an iterative design process which starts with the recognition and identification of a need or problem and development or their understanding through primary and secondary research. From this, students should be able to outline the requirements to solve the problem, then communicate their thought processes through sketching, drawing and modelling using their specification to guide the iterative design process. Once a solution has been established students are expected to produce a workable prototype of a saleable quality and finally they should have the tools and skills required to objectively evaluate their solution and recognise potential for future iterations and improvements.					
	Term 1		**Term 2**		**Term 3**	
Topic Titles (in order of delivery)	Theory 1. How can safety be ensured when working with materials in a workshop environment 2. What are the implications of health & safety legislation on product manufacture 3. What factors influence the selection of materials that are used in products 4. What materials and components should be selected when designing & manufacturing	Practical 1. Foam Modelling – Glue Gun 2. Vacuum former, 3D printing, casting – Chocolate Bar 3. Braising, workshop tools – wood & metal upcycling project	Theory 1. What considerations need to be made about the structural integrity of a design solution 2. How products can be designed to function effectively within their surrounding 3. Opportunities through using smart & modern technologies 4. Factors to be considered when investigating design possibilities 5. Factors to be considered when	Practical 1. Laser cutter, prototype modelling – slot together/ joint product 2. CNC router – Fusion 360, foam toy product	Theory 1. Exploring Contexts that design solutions are intended for 2. Stakeholder analysis 3. Usability when designing prototypes 4. Using 2D & 3D sketching/digital tools to graphically communicate ideas 5. How industry pros use digital design tools to	Practical 1. Lathe – wood/metal shaping 2. 1 week design and model challenges 3. NEA assessment/coursework started

	products/prototypes 5. Why is it important to consider properties/characteristics or materials in design & manufacture 6. How can materials & processes be used to: - Make iterative models - Final prototypes - Commercial products 7. How is manufacturing organised/managed for different scales of production 8. How is quality controlled through manufacture		developing design solutions for manufacture 6. Factors to consider when manufacturing a product 7. Factors to consider when distributing to market 8. Skills & knowledge from other subject areas & how they affect design 9. Analyse & evaluate products both in design & manufacturing process 10. Understand technological developments in product design 11. Understand past & present developments in design 12. Examining lifecycles of products		support/communicate the exploration, innovation & development of ideas 6. Different approaches to design thinking to support idea development 7. How can designers assess whether a design solution meets its stakeholders requirements 8. How can product designers and manufacturers assess whether a design solution meets the criteria of technical specification 9. How do designers	

					and manufacturers decide if design solutions are commercially viable	
Key knowledge / Retrieval topics	1. Material properties/characteristics, processes, life cycle, uses. 2. Types of manufacture that suit different material processes	1. Workshop Health & safety 2. How to use school equipment and machinery 3. Fusion 360 software & additional 3D printing systems	1. Product form & function 2. Product life cycle 3. Product design history & key developments 4. Smart & modern materials their properties and uses 5. Energy , energy storage 6. Sustainability	1. 2D Design software 2. Modelling & prototyping using different materials 3. Material selection & processes	1. Design investigation & research (Primary & secondary) 2. User, stakeholder requirements 3. Technical specification 4. Designers & design companies	5. Workshop tools & equipment
Understanding / Sequence of delivery	Students first need to understand the basics of the materials they will be working with/analysing/testing in order to aid their design choices in practical projects and later in the NEA.	Practical projects require students to produce NEA style & quality pages so that they understand what is required of them against the OCR specification. Allows for the opportunity to teach them layout of pages, drawing techniques including sketching, rendering and technical drawing pages. Projects serve as a reminder of how to use workshop equipment alongside learning how to	Students now with a basic understanding of materials can apply this knowledge to manufacturing and developing design solutions. This directly links to the wider implications of design/manufacture choices in all stages of a product life cycle.	Learning how to use 2D Design opens up the possibility of using the laser cutter & CNC router. Small scale modelling and prototyping is key for testing and getting ideas across in the NEA.	Students to complete the theory side of the year by looking into stakeholders, specifications and design development and manufacture as this heavily supports the work they start on their NEA.	Quick fire design challenges with modelling requirements helps teach students about pace of work and encourages innovation and idea generation to support their NEA.

		use new machinery they might use in their NEA				
Assessment	Proof of Progress (POP) tests every half term using exam questions – tests knowledge as well as exam question technique Mini projects are marked against OCR NEA mark scheme/grade boundaries NEA assessment: See OCR Product design specification: Design & Technology					