DESIGN & TECHNOLOGY CURRICULUM

Intent:
GCSE Design and Technology will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise.

	SPRING TERM Y10	AUTUMN TERM Y10	SUMMER TERM Y10 and all Y11
Main Topic / Focus	Activities 1, 2 and 3 Plywood Lamp Casting Pewter	Designing basics and clock project Mock exam and exam preparation Sample NEA	Non-Examined Assessment (NEA)
Secondary Topics (if applicable)	Activities 1, 2 and 3 are to allow the students to increase their abilities and confidence levels using workshop equipment and machinery. The plywood lamp is derived from industry practice – lamination and bending of plywood – as well as basic electronics and circuits.	1 and 2-Point Perspective Drawing Isometric Drawing Exploded Drawing Rendering and Tone Texture and Iteration 2D vs 3D Drawing CAD Google SketchUp	Summer of year 10 and all of year 11 are based solely around the NEA which equates to 50% of the GCSE.
Cross-curricular links	**Science:** Material properties; elements, ferrous/non-ferrous metals and alloys, Chemistry- extraction of ore and fossil fuels. **Maths:** Measuring, angles, working out materials. **Computer science**: Electrical systems, Input>Process>Output, electrical components. **Drama:** Set design	**Maths:** Volume, area, perimeter. **Science:** Sustainability and the environment, pollution. **Computer science**: CAD CAM and 3D virtual modelling **Drama:** prop design **Business studies**: Kaizen, just in time, co-operatives.	**Maths:** Calculating material, costing, measuring. **Science:** 6Rs: Recycle, reuse, rethink, deduce, refuse and repair. **Business studies**: Customer, client, costing.
Literacy	Automation: The use of control systems for operating equipment such as machinery and processes in factories; this reduces human input. Client: The person/people/audience being designed for and whose needs are being met. Commercial process Manufacturing method used to produce products in quantity. Commercial product intended to make money. Conceptual stages (of design) Use of models, sketches and computer aided design (CAD) to show the design of a product as it develops. Continuous improvement: The identification of improvements and subsequent evolution of products. Co-operative: A group of people united to meet common social, economic or cultural need through a jointly owned business. Crowd funding: A large number of people who raise money for a project or venture. Ecological: The consideration of the environment and the impact that design can have on it. Ethics: Moral decisions when designing and manufacturing. Fabricate: Using processes such as cutting, bending, joining and assembly to produce products. Finite: A material or source which will one day run out. Functionality: How well a product carries out its purpose. Fusibility: How well a material is converted by heat into a molten or liquid state dependent on its melting point. Iterative design: Design methodology based on a cyclical process of analysing, prototyping and testing to refine a product. Each iteration and result starts the process again. Lean manufacturing: Reducing and eliminating waste in a manufacturing process. Life cycle assessment: A technique used to assess the environmental impact of a product at all stages of its manufacture, use and disposal. Market pull: Products developed to meet the needs of society or a specific section of the market. Mechanical device: Mechanism which produces and/or changes movement. Nesting The tessellation of shapes or nets on a material to minimise the amount of waste during manufacture. Physical properties: Properties that refer to the actual matter that forms the material (eg insulation, conductivity, fusibility). Planned obsolescence: Deliberately designing the lifecycle of a product to be short, forcing the user to update their products quickly. Primary source: Research collected first-hand by a designer to develop a product or idea. Primary source (of materials): Where materials originate (polymers from oil etc) and the raw material that needs to be converted into a workable form. Product: Item or artefact developed for an intended audience to solve a problem or meet a need. Prototype: An early model or sample of a product used to test a concept. Schematic diagram: Graphic symbols or simplistic diagrams used to convey a system (eg an underground map). Social footprint: The impact a product or individual has on society. Social responsibility: The idea that a designer needs to evaluate the impact their product could have on society and take action to make this better. Stock form: The standard shape and size of materials as they are bought. Technology push: Technological discoveries used to drive the development of a product. Tolerance: The minimum and maximum measurements that can be accepted when manufacturing. The person/people who make use of the product that has been developed by a designer. User centered design: Design development with the user at the centre of the focus. The designer tries to envisage how the product will actually be used, as opposed to focusing on other areas such as cost. Working properties: How a material reacts to external forces.		

Cultural capital	Changes in fashion and trends in relation to new and emergent technologies. Respecting people of different faiths and beliefs. How products are designed and made to avoid having a negative impact on others: • design for disabled • elderly • different religious groups, Positive and negative impacts new products have on the environment: • continuous improvement • efficient working • pollution • global warming.		
STEM Opportunities	Geography / Science Ethical factors and consideration of ecological and social footprint. How to choose appropriate energy sources. Visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/ mechanical movement. The action of forces and how levers and gears transmit and transform the effects of forces. Arithmetic and numerical computation eg use ratios. Use angular measures in degrees, visualise and represent 2D and 3D objects including 2D diagrams of mechanisms/ mechanical movement. Knowledge of the function of mechanical devices to produce different sorts of movement, changing the magnitude and direction of forces. Scientific vocabulary eg metals/non-metals and physical and chemical differences between them eg types and properties across a range of materials. Using materials eg composition of some important alloys eg selection of an alloy for enhanced durability in a particular design situation.		
Gatsby Benchmark 4 - Linking Curriculum to Careers	Routes of progression after Weaverham discussed with class: A-Level, BTEC, apprenticeship, university. Past pupils who studied at Weaverham visit to explain working in industry. Transferable skills: Problem solving, project management, tools & equipment, processes, teamwork, communication, research, analysis, evaluation, iterative design.	Career links: Architect, engineer, product designer, project manager, graphic designer, joiner, furniture maker, cabinet maker, automotive designer, interior designer, fashion designer, concept artist, prop design, set design, industrial design, builder, property renovation.	
Assessment	Activities 1,2, and 3 are verbally assessed and CRAFTED / evaluated in student books. Plywood Lamp – Key mark piece Casting Pewter – Key mark piece Several home-learning tasks for retrieval	Series of mock exam questions Clock project: Key mark piece Mock Exam 1: 2-hour exam	• Written exam: 2 hours • 100 marks • 50% of GCSE Section A – Core technical principles (20 marks) A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding. Section B – Specialist technical principles (30 marks) Several short answer questions (2–5 marks) and one extended response to assess a more in-depth knowledge of technical principles. Section C – Designing and making principles (50 marks) A mixture of short answer and extended response questions. How it's assessed • Non-exam assessment (NEA): 30–35 hours approx. • 100 marks • 50% of GCSE