



This year in GCSE Design and Technology we will be learning:		This links to:	Key Vocabulary:		
1	Materials and their working properties unit The five key material areas: 1. Papers and boards 2. Natural and manufactured timbers 3. Metals and alloys 4. Polymers 5. Textiles - What are the primary sources of materials for producing a variety of materials in each of the five key material areas - How to recognise and characterise different types of materials in each key area - How the physical and working properties of a material products affect their performance - How to select the most appropriate material appropriate to a given task	Students have had some practical experience of working with each material area during KS3.	- Absorbency - Density - Fusibility - Electrical and thermal conductivity - Strength - Hardness - Toughness - Malleability - Ductility - Elasticity		
2	Common specialist technical principles unit - What are the different forces and stresses. - How materials have been stiffened or reinforced. - What an ecological footprint is, including how deforestation, mining, drilling and farming affect our ecology and that carbon dioxide is produced during the manufacture of products and its influence on global warming. - A social footprint and how safe working conditions impact on others. - How products are produced in each of the four main scales of production.	This unit builds upon the students' introduction to sustainability, the environment and scales of production received in year 9. This unit then introduces forces, stresses and reinforcement. primary data, secondary data, market research, focus group, ergonomics, anthropometrics, percentile, median	- Tension - Compression - Bending - Torsion - Shear - Reinforcement - Greenhouse gasses - One-off production - Batch production - Mass production - Continuous production		
3	Designing Principles unit - The difference between primary and secondary research. - How to gather anthropometric research and interpret the use of percentiles in anthropometric data, leading to ergonomic design. - The work of designers and design companies. - How to write an appropriate design brief and specification. - The cycle of iterative designing and how to avoid design fixation - How to draw in isometric projection and the use of exploded drawings. - How to produce a 3rd angle orthographic projection. - How to fully analyse a products suitability.	This unit build upon students' prior introduction to designers in year 8. Students have knowledge of design briefs, specifications and the iterative design process which has been covered on projects throughout KS3. Students have also practiced the skill of drawing in isometric projection and orthographic projection in KS3. This unit then introduces market research, anthropometrics and ergonomics and further develops design and analytical skills.	- Primary data - Secondary data - Market research - Focus group - Ergonomics - Anthropometrics - Percentile - Median		
Target Grade:		AP1:	AP2:	AP3:	End of year exam



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1	Making Principles unit • How to select and use materials and components appropriate to a specific task • Understand how functionality, availability and cost affect the selection of materials and components • How to use tolerances to ensure accuracy when making a product • How to use and identify datum points and coordinates when measuring and marking out • Understand how to select and use specialist tools, equipment, techniques and processes • What the relevant health and safety issues are and how to protect themselves and others from harm • What are surface treatments and finishes that are applied for functional and aesthetic purposes	This unit builds upon students' prior knowledge and skills practiced throughout KS3 using different materials to manufacture products. tolerance, allowance, overlap, tessellation, nesting, datum, template, jig, pattern, batch, data sheet, risk assessment, PPE, treatment, rust, corrosion, rot, key	• Tolerance • Datum • Template • Jig • Pattern • Risk assessment • Personal protective equipment • Treatment • Finish • Corrosion						
2	New and emerging technologies unit • The impact of new and emerging technologies on tools and equipment. • How robotics has affected the workplace. • How co-operative and fair trade organisations operate. • How new technologies need to be developed and produced in a sustainable way. • How technology push and market pull affect consumer choice and employment. • How changes in fashion and trends affect designers and manufacturers. • How automation, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) are used in industry. • How products can be designed to be repaired and recycled.	This unit builds upon students' previous experience of working with electronic components, tools and machines in KS3. It builds upon their knowledge of machining, Computer Numerical Control, robotics and automation. It also introduces new concepts such as crowd funding, cooperatives, fair trade, technology push, market pull and planned obsolescence.	• Robotics • Crowd funding • Cooperatives • Fair trade • Technology push • Market pull • Planned obsolescence • Computer Aided Design • Computer Aided Manufacture						
3	Energy, materials, systems and devices. unit • How power is generated from oil, gas, coal and nuclear sources. • How renewable energy is generated from a variety of sources. • How to identify mechanical and chemical power and understand how it is stored. • A range of modern, smart and composite materials. • That all systems comprise of one or more inputs, processes and outputs. And be able to recognise input, process and output components. • The different types of mechanical movement. • How different mechanisms (levers, cams, gears, pulleys) can change the direction of movement, the force and the speed.	This unit builds upon students' previous knowledge of mechanisms, including motion, levers, cams, pulleys and gears in KS3. It develops and deepens their understanding of power sources, electronic systems, modern, smart and composite materials.	• Fossil fuels • Renewable energy • Photochromic material • Thermochromic material • Composites • Microcontroller • Nanomaterials • Smart materials • Mechanism						
Target Grade:		AP1:		AP2:		AP3:		End of year exam	