

Autumn Term		Spring Term		Summer Term	
Key knowledge: <ul style="list-style-type: none"> 3.1.1 Materials and their applications- Classification of materials Methods for investigating and testing materials 3.1.2 Performance characteristics of materials Performance characteristics of papers and boards Performance characteristics of polymer based sheet and film Performance characteristics of metals, woods and polymers Elastomers, Biodegradable polymers, Composites, Smart materials Modern materials 		Key knowledge: <ul style="list-style-type: none"> 3.1.3 Enhancement of materials-Wood and metal enhancement 3.1.4 Forming, redistribution and addition processes Polymer processes, Metal processes, Wood processes 3.1.4.5 The use of adhesives and fixings- Jigs and fixtures 3.1.5 The use of finishes- paper, polymer, metal, wood 3.1.6 Modern industrial and commercial practice Scales of production 		Key Knowledge: <ul style="list-style-type: none"> 3.1.6.2 Efficient use of materials The use of computer systems and Sub-assembly 3.1.7 Digital design and manufacture Computer aided design (CAD), Computer aided manufacture (CAM) Virtual modelling, Rapid prototyping processes, Electronic data interchange Production, planning and control (PPC) networking 3.1.8 The requirements for product design and development Product development and improvement Inclusive design, ergonomics, anthropometrics, sustainability 	
Pupils will be able to: Answer exam questions	Key Vocabulary: polymers, timbers, metals, smart and new materials, composites, physical and mechanical properties	Pupils will be able to: Answer exam questions	Key Vocabulary: laminating, sand casting, welding, die cutting, injection moulding, calendaring, line bending, blow moulding, vacuum forming, CAD/CAM, one off, batch, mass	Pupils will be able to: Answer exam questions	Key Vocabulary: inclusive design, ergonomics, anthropometric data, sustainability, CAD/CAM, materials efficiency
Assessment: End of topic tests		Assessment: End of topic tests		Assessment: End of topic tests	
Enrichment Opportunities: University of Birmingham- Engineering Experience		Enrichment Opportunities: Morgan Motors		Enrichment Opportunities: Silverstone Museum	

**KS5
Year 12**

Autumn Term		Spring Term		Summer Term	
Key knowledge: <ul style="list-style-type: none"> • 3.1.9 Health and safety • Safe working practices • 3.1.10 Protecting designs and intellectual property • 3.1.11 Design for manufacturing, maintenance, repair and disposal • Manufacture, repair, maintenance and disposal • 3.1.12 Feasibility studies • 3.1.13 Enterprise and marketing in the development of products • 3.1.14 Design communication • 3.2.1 Design methods and processes • Iterative design process • 3.2.2 Design theory • Design influences 		Key knowledge: <ul style="list-style-type: none"> • 3.2.3 How technology and cultural changes can impact on the work of designers • 3.2.3.4 Product life cycle • 3.2.4 Design processes • The use of a design process • 3.2.5 Critical analysis and evaluation • Testing and evaluating products in commercial products • 3.2.6 Selecting appropriate tools, equipment and processes • 3.2.7 Accuracy in design and manufacture • 3.2.8 Responsible design and Environmental issues • 3.2.9 Design for manufacture and project management • 3.2.10 National and international standards in product design 		Key Knowledge: <ul style="list-style-type: none"> • To retrieve knowledge gained in Y12 and activate activities throughout Y13 for the exam topics. Going through past paper and exam questions. 	
Pupils will be able to: Answer exam questions	Key Vocabulary: health and safety, design communication, design movements, design process	Pupils will be able to: Answer exam questions	Key Vocabulary: product life cycle, environmental issues, international standards	Pupils will be able to: Answer exam questions	Key Vocabulary: all keywords from Y12 and 13 in previous terms.
Assessment: End of topic tests		Assessment: End of topic tests		Assessment: End of topic tests	
Enrichment Opportunities: Mini car Factory Tour in Oxford		Enrichment Opportunities:		Enrichment Opportunities:	

Autumn Term Research		Spring Term Designing		Summer Term Design Development	
Key Knowledge: <ul style="list-style-type: none"> To know the problem and outline solution for the problem To know the user and create a user board To investigation product and find out how they can be improved To do specific research about the about the product you intend to make Slide 1- Investigation Slide 2- The User Slide 3 and 4- Product Analysis 1 and 2 Slide 5,6 and 7- Specific Research 1,2 and 3 		Key knowledge: <ul style="list-style-type: none"> To know what research analysis is To know communication techniques to create a range of ideas To know what a design brief is and specification. Slide 8, 9 and 10- initial ideas Slide 11- Research analysis Slide 12- Design Brief Slide 13 and 14-Design Specification 		<ul style="list-style-type: none"> To design and development your design further and improve them Slide 15, 16, 17, 18, 19 and 20- Design Development 	
Pupils will be able to: Create high quality coursework	Key Vocabulary: problem, user, social, moral, economic and environmental issues, interview, product analysis, design brief and specification	Pupils will be able to: Create high quality coursework	Key Vocabulary: design ideas, drawing techniques, CAD/CAM, materials, processes, sustainability, ergonomics, card modelling	Pupils will be able to: Create high quality coursework	Key Vocabulary: design ideas, drawing techniques, CAD/CAM, materials, processes, sustainability, ergonomics, card modelling
Assessment: 50% coursework		Assessment: 50% coursework		Assessment: 50% coursework	
Enrichment Opportunities: University of Birmingham- Engineering Experience		Enrichment Opportunities: Morgan Motors		Enrichment Opportunities: Silverstone Museum	

Autumn Term Research		Spring Term Designing		Summer Term Design Development	
Key Knowledge: <ul style="list-style-type: none"> To investigate one design further by research materials, processes, ergonomics, sustainability and specific measurements. To use CAD skills to create a presentation, orthographic and exploded drawing To use a range of practical skill and a range of materials to create your final prototype To know how to test and evaluate your final product so improvement can be made Slide 21, 22, 23, 24, 25, 26, 27, 28, 29 and 30- Product Development Slide 31, 32, 33- Presentation, orthographic and exploded drawing Slide 34- Cutting List Slide 35- Product Specification Slide 36, 37, 38, 39- Production diary 		Key knowledge: <ul style="list-style-type: none"> To use a range of practical skill and a range of materials to create your final prototype To know how to test and evaluate your final product so improvement can be made Slide 40- Final prototype 		Key Knowledge: <ul style="list-style-type: none"> To know how to test and evaluate your final product so improvement can be made Slide 41, 42- Testing Slide 43, 44- Evaluation 	
Pupils will be able to: Create high quality coursework	Key Vocabulary: problem, user, social, moral, economic and environmental issues, interview, product analysis, design brief and specification	Pupils will be able to: Create high quality coursework	Key Vocabulary: practical work- band saw, pillar drill, sanding machine, router, fret saw, craft knife, laser cutter, 3D printer, vacuum forming, pewter casting, line bending, wood joints, laminating, testing and evaluation	Pupils will be able to: Create high quality coursework	Key Vocabulary: practical work- band saw, pillar drill, sanding machine, router, fret saw, craft knife, laser cutter, 3D printer, vacuum forming, pewter casting, line bending, wood joints, laminating testing and evaluation
Assessment: 50% coursework		Assessment: 50% coursework		Assessment: 50% coursework	
Enrichment Opportunities: Mini car Factory Tour in Oxford		Enrichment Opportunities		Enrichment Opportunities	