



This year in Engineering we will be learning:					This links to:		Key Vocabulary:	
1	Unit R014: Principles of engineering manufacture Topic Area 1: Engineering Materials The two key material property areas: 1. Mechanical properties 2. Other properties influencing manufacturing The five key material areas: 1. Metals 2. Polymers 3. Engineering ceramics 4. Composite materials 5. Smart materials What are the primary sources of materials for producing a variety of materials in each of the five 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 - Understand how the properties of these materials relate to their manufacturing characteristics. - How to select the most appropriate material appropriate to a given application				This unit of study builds upon the foundation of knowledge students have of materials from Key Stage 3. This includes practical work with specific material areas such as metals and polymers. This unit provides a sound foundation of knowledge in choosing manufacturing processes (Topic Area 2) based upon material working characteristics.		Mechanical properties: - Strength; yield/tensile, compressive - Elasticity - Ductility - Hardness Other properties influencing manufacture: - Malleability - Machinability - Cost; material, manufacturing - Sustainability Materials: - Metals; ferrous, non-ferrous, pure, alloys - Polymers; , thermoplastics, thermosetting - Engineering ceramics - Composite materials - Smart materials - Forms of supply - Properties - One-off - Batch - Mass	
	Unit R014: Principles of engineering manufacture Topic Area 2: Manufacturing Processes The six key manufacturing process areas: 1. Wasting 2. Shaping 3. Forming 4. Additive processes 5. Joining 6. Finishing - How to select the most appropriate manufacturing process based on material working properties - How to select the most appropriate methods of joining and finishing specific materials - New developments in engineering manufacture				Students have gained some practical experience in the application of manufacturing processes including; wasting, shaping, forming, joining, finishing. This unit provides a sound foundation of knowledge to be able to critically evaluate manufacturing requirements (Topic Area 3).		- Health and safety - Sawing - Shearing - Drilling - Filing - Threading - Routing - Laser-cutting - Turning - Milling - Casting - Forging	
Target Grade:		AP1:	AP2:	AP3:	AP4:	AP5:	AP6:	End of year exam