	DEPARTMENT:	E	ngineering							
Year	Term 1		Term 2		Term 3		Term 4		Term 5	
	Topics Engineering processes, students will learn about the different e engineering Worksop. E.g. Milling, turning, vacuum forming . In risks and protective equipment. Introduction to the workshop, general marking out equipment	nportance of health and safety, hazards	Topics Engineering processes, students will learn about the different e engineering Worksop. E.g. CNC, hot works including brazing, for and safety regarding hot works in general, hazards risks and pro	ging and casting. Importance of health	Topics Materials, ferrous and non ferrous metals Properties of materials that are used in engineering including, e materials in production processes and how properties can chan		Topics Materials, Non metals. Polymers and smart and composite mat Properties of non metal materials, alloys. Why are certain mat of materials on designs and lifecycles of products.		Topics Electrical theory, Ohms Law, Power Rule . Series and parallel Power generation - how we generate electricity. Electrical motors and solenoids and their application. Basic ele why they are used.	
	Knowledge & Skills Be able to recognise hazards and risks associated with an engineering workshop. Describe the main components of the workshop equipment and what they are used for.	Why? It is vital that students are aware of the different processes used to allow them to progress. In an engineering environment they should have a wide knowledge of basic engineering processes.	Knowledge & Skills Be able to recognise hazards and risks associated with an engineering workshop. Describe the main components of the workshop equipment and what they are used for.	Why? It is vital that students are aware of the different processes used in forming and joining allowing them to progress. In an engineering environment they should have a wide knowledge of basic engineering processes, including those involving forming and joining.	Knowledge & Skills Be able to recognise hazards and risks associated with an engineering workshop. Describe metallic materials and their properties. State why certain materials	Why? It is vital that students are aware of the different processes used to allow them to progress. In an engineering environment they should have a wide knowledge of basic engineering processes.	Knowledge & Skills Be able to differentiate between different materials, state where and why materials are used in different environments. Link materials for their properties Le. conductors or insulators, corrosion resistant, etc.	Why? It is vital that students are aware of the different materials used to allow them to progress. In an engineering environment they should have a wide knowledge of basic engineering materials.	Knowledge & Skills Be able to recognise describe how different circuits operate and where the theory is applied with an engineering environment. Describe electrical and electronic components their operatio and function.	n e
9	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers E.g. Mechanical, design, electrical. Students can progress into many engineering sectors.	Group Differentiation Students are taught using various teaching methods visual, auditory and kineaschtetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers E.g. Mechanical, design, electrical. Students can progress into many engineering sectors.	Group Differentiation Students are taught using various teaching methods visual, auditory and kineasthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers E.g. Mechanical, design engineering, electrical and electronics. Students can progress into many engineering sectors and further their education in their chosen disciplines.	Group Differentiation Students are taught using various teaching methods visual, auditory and kineasthetic. Equipment is demonstrated and modelling is used in the dassroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers E.g. Mechanical, design, electrical. Students can progress into many engineering sectors.	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	1
	Reading & Extended Writing. Students will write reports on the processes used in engineering .	Numeracy. Measurement and accuracy, conversion to millimetres.	Reading & Extended Writing. Students will write reports on the processes used in engineering .	Numeracy. Measurement and accuracy, conversion to millimetres.	Reading & Extended Writing. Students will write reports on the processes used in engineering .	Numeracy. Measurement and accuracy, conversion to millimetres.	Reading & Extended Writing. Students will write reports on the processes used in engineering .	Numeracy. Measurement and accuracy, conversion to millimetres.	Reading & Extended Writing. Students will write reports on the processes used in engineering .	N t c
	SMSC Students will learn about sustainability, and the 5r's for environ sector. Students will also learn to work in groups teaching them teaching is encouraged when appropriate improving social and	tolerance and patience with others. Peer	SMSC Students will learn about sustainability, and the 5r's for environ sector. Students will also learn to work in groups teaching them teaching is encouraged when appropriate improving social and	tolerance and patience with others. Peer	SMSC Students will learn about sustainability, and the 5r's for environ sector. Students will also learn to work in groups teaching them teaching is encouraged when appropriate improving social and	tolerance and patience with others. Peer	SMSC Students will learn about sustainability, and the 5r's for enviror sector. Students will also learn to work in groups teaching then teaching is encouraged when appropriate improving social and	tolerance and patience with others. Peer	SMSC Students will learn about sustainability, and the 5r's for enviro sector. Students will also learn to work in groups teaching the students will look at conservation of energy and the environn teaching is encouraged when appropriate improving social an	em to nenta
10	Topics Component 1 A , Completion of Exploration of engineering sectors. Engineering organisations , small medium global. Functions within organisations Component 1B , Exploring engineering skills		medium global. Functions within organisations Component 1B , Exploring engineering skills		Topics Component 1B, Producing initial design proposals looking at different processes and how these help with quality. Initial design ideas looking at and analysing existing designs. 2D and 3D Design sketching		Topics Component 18, Producing initial design proposals looking at different processes and how these help with quality. Initial design ideas looking at and analysing existing designs. 2D and 3D Design sketching		Topics Component 3: re-design of an existing product Materials and processing required in the modification of an existin	
	Knowledge & Skills Knowledge of how sectors work together job roles and the functions within a company. Workshop hands kills. Design processes and planning. Engineering briefs, how to interpret a brief and how to design your own brief.	Why? Linked to assessment . Students have an underpinning knowledge of what engineers do, this will help them when it comes to choosing careers in engineering. Workshop skills learnt will help students be more able to analyse problems and overcome these	Knowledge & Skills Knowledge of how sectors work together job roles and the functions within a company. Workshop hands kills. Design processes and planning. Engineering briefs, how to interpret a brief and how to design your own brief.	Why? Linked to assessment . Students have an underpinning knowledge of what engineers do, this will help them when it comes to choosing careers in engineering. Workshop skills learnt will help students be more able to analyse problems and overcome these	Knowledge & Skills planning of a design. Sketching Brainstorming mind maps , Creative thinking techniques. CAD skills, Modelling. Production of prototypes using 3D print etc.		Knowledge & Skills planning of a design. Sketching Brainstorming mind maps , Creative thinking techniques. CAD skills, Modelling. Production of prototypes using 3D print etc.		Knowledge & Skills planning of a design. Sketching Brainstorming mind maps , Creative thinking techniques. CAD skills, Modelling. Production of prototypes using 3D prin etc.	t u
	Group Differentiation Students are taught using various teaching methods visual, auditory and kineachtetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers Careers in engineering , unit covers engineering sectors and careers generally within engineering	Group Differentiation Students are taught using various teaching methods visual, auditory and kineaschtetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers Careers in engineering , unit covers engineering sectors and careers generally within engineering	Group Differentiation Students are taught using various teaching methods visual, auditory and kineasthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers Careers in engineering , unit covers engineering sectors and careers generally within engineering	Group Differentiation Students are taught using various teaching methods visual, auditory and kineasthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers Design in Engineering Mechanical Design Material engineering	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	1
	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term	Numeracy. Measurement and accuracy	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term	Numeracy. Measurement and accuracy	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term	Numeracy. Measurement and accuracy	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term	Numeracy. Measurement and accuracy	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term	N
	Students will learn about sustainability, and the 5r's for environmental impact within the engineering		SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.		SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.		SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.		SMSC Students will learn about sustainability, and the 5r's for environme sector. Students will also learn to work in groups teaching them to teaching is encouraged when appropriate improving social and cor	
	Topics Component 1B, Producing Initial design proposals looking at different processes and how these help with quality. Initial design ideas looking at and analysing existing designs. 2D and 3D Design sketching		Topics Component 18, Producing initial design proposals looking at different processes and how these help with quality. Initial design ideas looking at and analysing existing designs. 2D and 3D Design sketching		Topics Component 28, Disassembly of components , inspection and evaluation. Measurement and observation Different components and fixtures Product design specifications.		Topics Component ZA, Understanding Materials processes and components Ferrous and non ferrous metals Polymers Smart and modern materials, material properties		Topics. Component 2A and Component 3 Engineering processes. Assessment preparation for Component 3	
	Knowledge & Skills planning of a design. Sketching Brainstorming mind maps , Creative thinking techniques. CAD skills, Modelling. Production of prototypes using 3D print etc.	Why? Skills used in the engineering sectors making students aware of what engineering is and encouraging the take up of engineering as a career. Skills used widely in the engineering sector.		Why? Skills used in the engineering sectors making students aware of what engineering is and encouraging the take up of engineering as a career. Skills used widely in the engineering sector.	knowledge & Skills Hands kills and dexterity. Materials and properties Data collation	Why? In industry students may be asked to strip down products to carry out maintenance, understanding basic methods of ensuring products are put back together will enhance their usefulness as a junior employee	Knowledge & Skills Material Characteristics Proprietary components Characteristics of components	Why? In Industy the knowledge of materials and their characteristics is a basic requirement, understanding their properties will give them deeper knowledge.	Knowledge & Skills Combination of skills and knowledge learnt throughout the 2 years Materials, processes, evaluation, data collection , analysis, planning .	l I I I I
11	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom	Links to careers. General engineering skills could be adapted to most sectors within the industry including, mechanical, electronic, aerospace etc	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom	Links to careers. General engineering skills could be adapted to most sectors within the industry including, mechanical, electronic, aerospace etc	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom	Links to careers Mechanical engineering Design engineering. Metrology.	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom whether the statemeters.	Links to careers. General engineering skills could be adapted to most sectors within the industry including, mechanical, electronic, aerospace etc	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom	1
	Reading & Extended Writing. Report writing and research skills required this will include skimming as well as more in-depth reading.	Numeracy Data collection, measurement basic arithmetic.	Reading & Extended Writing. Report writing and research skills required this will include skimming as well as more in-depth reading.	Numeracy Data collection, measurement basic arithmetic.	Reading & Extended Writing. Report writing and research skills required this will include skimming as well as more in-depth reading.	Numeracy Data collection, measurement basic arithmetic.	Reading & Extended Writing. Report writing and research skills required this will include skimming as well as more in-depth reading.	Numeracy Data collection, measurement basic arithmetic.	Reading & Extended Writing. Report writing and research skills required this will include skimming as well as more in-depth reading.	1
	sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer		Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer				SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.		SMSC Students will learn about sustainability, and the 5r's for environme sector. Students will also learn to work in groups teaching them to teaching is encouraged when appropriate improving social and cor	

		Term 6	Term 6						
		Topics							
	cuits. Direct and alternating currents. ronic component s - what they do and	Mechanical principles, gears, levers, forces etc. Types of levers and gear trains , mechanical advantage. Application of mechanical principles. Project work, culmination of topics through the year to make a product and report on how it has been							
	Why? It is vital that students are aware of basic electrical theory and components them to progress. In an engineering environment they should have a wide knowledge of basic engineering components and how we produce and use electrical circuits and components .	made to include design -> manufacture -> testing . Knowledge & Skills Be able to how basic machine theory is used in an engineering environment. Be able to work out problems involving basic gear trains and levers. State the application and evaluate the use of mechanical principles.	Why? It is vital that students are aware of the different mechanical principles used in an engineering environment they should have a wide knowledge of basic engineering principles including pulleys, gears and levers.						
	Links to careers E.g. Mechanical, design, electrical. Students can progress into many engineering sectors. Students will eventually be able to progress to further and higher education too. Numeracy.	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning. Reading & Extended Writing.	Links to careers E.g. Mechanical, design, electrical. Students can progress into many engineering sectors. Numeracy.						
	Numeracy. Measurement and accuracy, conversion to millimetres. Graphs and manipulation of formula. Basic algebra	Students will write reports on the processes used in engineering .	Measurement and accuracy, conversion to millimetres. The use of ratios with regards to velocity and torque. Gear						
m t nen	mental impact within the engineering tolerance and patience with others. The tal impact of power generation. Peer communication skills.	SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.							
cist	ting product .	Topics Introduction to component 2 A and B Redesign processes. Materials and engineering processes. Analysis of engineering briefs, design processes. Manufacture of products . Health and safety							
t	Why? Skills used in the engineering sectors making students aware of what engineering is and encouraging the take up of engineering as a career. Skills used widely in the engineering sector.	Knowledge & Skills planning of a design. Sketching Brainstorming mind maps, Creative thinking techniques. CAD skills, Modelling. Production of prototypes using 3D print etc.	Why? Skills used in the engineering sectors making students aware of what engineering is and encouraging the take up of engineering as a career. Skills used widely in the engineering sector.						
	Links to careers Design in Engineering Mechanical Design Material engineering	Group Differentiation Students are taught using various teaching methods visual, auditory and kneasthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom behaviour and learning.	Links to careers Design in Engineering Mechanical Design Material engineering						
	Numeracy. Measurement and accuracy	Reading & Extended Writing. Research topics and report writing used throughout the topics in this term. Researching engineering terminology	Numeracy. Measurement and accuracy. Weights forces						
m t	mental impact within the engineering tolerance and patience with others. Peer communication skills.	SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.							
		Topics. Preparation for 6th form or Further Education. Engineering mathematics and science.							
	Why? These are general skills required in all engineering sectors these skills and knowledge will help students to progress within employment or further education.	Knowledge & Skills. Algebra, formula manipulation trigonometry and applications Forces etc. Speed acceleration problems SUVAT.	Why? Knowledge gained in this term will help students they will also have an insight into the level requirements for engineering.						
	Links to careers. Employment skills in general, focussed on engineering sectors including mechanical and electrical engineering.	Group Differentiation Students are taught using various teaching methods visual, auditory and kinaesthetic. Equipment is demonstrated and modelling is used in the classroom. Differentiated hand outs are used. Seating plans are used to help with classroom	Links to careers. Links to progression but also to science and maths based careers.						
	Numeracy Data collection, measurement basic arithmetic.	Reading & Extended Writing	Numeracy. Basic numeracy alongside mathematical problems and manipulation.						
onmental impact within the engineering m tolerance and patience with others. Peer d communication skills.		SMSC Students will learn about sustainability, and the 5r's for environmental impact within the engineering sector. Students will also learn to work in groups teaching them tolerance and patience with others. Peer teaching is encouraged when appropriate improving social and communication skills.							