



Long Term Plan & Curriculum Intent Technical & Vocational 2021 2022

SUBJECT:

Engineering

Department Curriculum intent:

Design and technology is an inspiring and rigorous and practical subject. Creativity and imagination are encouraged, so pupils design and make products to solve real world problems within a variety of contexts. Studying design technology helps to prepare our young people for living and working in a rapidly changing technological world. At North Durham Academy this is achieved by teaching our students technical understanding as well as building upon other disciplines such as maths, science, engineering, computing and art. Pupils are encouraged to take risks throughout the design process to become effective and innovative problem solvers whilst creating unique designs. Through the analysis of past and present design and technology products, the develop an understanding of positive design on the world that we live in.

At Key Stage 3 (Y7,8,9) all students study DT within a rotation including Graphics, food, Resistant Materials with STEM flowing throughout. In DT lessons students are encouraged to develop confidence and practical expertise using a variety of materials to create a range of good quality products. It is our aim to develop independent, competent learners who progressively increase their subject knowledge. We look to develop and improve their ability to work independently to produce high quality products for a wide range of users.

We aim to challenge student's intellectual, creative and practical abilities during problem solving activities, whilst developing the personal skills they will need when entering employment, and vital life skills whilst being an effective and positive member of the local community.

Qualities we aim to develop in students:

Social skills	Practical / hand skills
Technical skills & knowledge	Use of CAD CAM
Creative thinking	Materials/ingredient knowledge
Problem solving	Safe working practice

Related Documents:

- LTP - Overview of Activities
- MTP's
- Assessment Grids

National Curriculum - Design Technology

Aims

The national curriculum for design and technology aims to ensure that all pupils:	Year 7				Year 8				Year 9			
	Food & Nutrition	Resistant materials – Man Vs Machine	Graphics -How to make a card dance	Digital technology	Food & Nutrition	Resistant materials- Picture frame	Graphics – Action figure	Engineering – Coat Hook	Food & nutrition	Resistant Materials - Gum ball dispenser	Product design -Speaker	Food – Cultural Cuisines
<ul style="list-style-type: none"> develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world 		-Generating design ideas -Hand skills -CAD skills	-Generating design ideas -Hand skills	-Introduction to programming		-Generating design ideas -Hand skills -CAD CAM skills	-Generating design ideas	-Generating design ideas -Use of CAM		-Generating design ideas -CAM designs /sketch up /2D design.	-Generating design ideas -CAM designs /sketch up /2D design.	
<ul style="list-style-type: none"> build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users 		-Hand skills -CAD skills -Card prototyping	-Hand skills -Prototyping			-Hand skills -CAD skills -Casting	-Prototyping /modelling	-Use of CAD CAD to product produce quality product. -Increase materials knowledge Metal, Woods.			-Sketch up design ideas	
<ul style="list-style-type: none"> critique, evaluate and test their ideas and products and the work of others 	-smoothie -pizza wheels -chicken nuggets -egg fried rice -savoury seasonal scones	-Product analysis -Peer evaluation	-Product analysis -Annotating design ideas -Evaluating prototypes -Evaluating final product	-Evaluate products performance	-Stir fry -life stage practical -fakeaways product	-Product analysis -Annotating design ideas -Evaluating final product	-Product analysis -Self /peer evaluation	-Product analysis -Testing and evaluating their work.		-Design annotations /self-evaluation	-Design annotations /self-evaluation	
<ul style="list-style-type: none"> understand and apply the principles of nutrition and learn how to cook 												
Design												
<ul style="list-style-type: none"> use research and exploration, such as the study of different cultures, to identify and understand user needs 	-smoothie sensory analysis -Seasonality scones end project	-Product analysis	-Product analysis -Design Specification		-Stir fry -life stage practical -fakeaways product	-Product analysis -Design Specification	-Product analysis -Client profile	-Client profile -Product analysis			-Product analysis -client profile	
<ul style="list-style-type: none"> identify and solve their own design problems and understand how to reformulate problems given to them 	-Seasonality scones end project		-Identifying suitable mechanisms	-Problem solving in making robot move around the road map	-Fakeaway Project	-Generating design ideas -Casting /mould making.	-Developing design nets	-Use knowledge of CAD CAM to produce a creative original outcome.		--Use knowledge of CAD CAM to produce a creative original outcome.	-Generating design ideas	
<ul style="list-style-type: none"> develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations 		-Design specification	-Design specification			-Design specification	Design specification					
<ul style="list-style-type: none"> use a variety of approaches [for example, biomimicry and user-centred design] to generate creative ideas and avoid stereotypical responses 		-Generating design ideas 3D drawing /shading -card prototypes / 2D design	-Generating design ideas Rendering techniques, CAD			-Generating designs / Isometric drawing / 2D design/ Shading skills.	-Generating designs / Isometric drawing / 2D design/ Shading skills.	-Develop new hand skills/ metal work. -Use knowledge of CAD CAM to produce a creative			-Generating design ideas / Sketch up	

									original outcome.				
<ul style="list-style-type: none"> develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations 		-Design annotations -plan for manufacture	-Generating design ideas - annotations	-Detailed flow chart & mathematical modelling in programming			-Generating design ideas -Design annotations -CAD design -plan for manufacture	-Generating design ideas -Design annotations	-Generating design ideas/ isometric drawing -Final design /sketchup		-3D modelling in sketch up -Designing using 2D design	-3D modelling in sketch up -Designing using 2D design	
Make													
<ul style="list-style-type: none"> select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture 		-Handmade product -Using machinery	-Card modelling /cutting shaping, folding.	-Introduction to programming /coding			-Planning for manufacture -Making/ wood work skills / casting / engraving	-Cutting skills -Cam skills	-Hand /machine skills, forming steel hook. -Use of CAD CAM to produce the back board.		-CAD CAM skills in manufacturing	-CAM skills in manufacturing -Soldering	
<ul style="list-style-type: none"> select from and use a wider, more complex range of materials, components and ingredients, considering their properties 	-smoothie -pizza wheels -chicken nuggets -egg fried rice -savory seasonal scones	-Plastics /Acrylic	-Card types			-Stir fry -life stage practical -fakeaways product	-Wood/ soft/hardwood and their origins?	-Packaging	-Materials and their properties -Metal forming, Plywood/acrylic.				
Evaluate													
<ul style="list-style-type: none"> analyse the work of past and present professionals and others to develop and broaden their understanding 		-Product analysis of existing products	-Product analysis of existing examples				-Product analysis of existing examples	-Product analysis of existing examples	-product analysis				-Product analysis
<ul style="list-style-type: none"> investigate new and emerging technologies 		-CAM skills		-How can programming & robotics change our society			-CAM skills	- Smart/modern materials					-CAD programming -Cam Skills.
<ul style="list-style-type: none"> test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups 		- Modelling card prototype	-Modelling card prototype	- Evaluate product performance against spec				- Modelling card prototype	-Prototyping -Evaluation				-Self evaluation
<ul style="list-style-type: none"> understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists 		-Impact of the selected materials	-Impact of the selected materials	-The impact of programming and robotic on society.			-Impact of the selected materials -Origins of selected materials		-impact of materials on the environment				
Technical knowledge													
<ul style="list-style-type: none"> understand and use the properties of materials and the performance of structural elements to achieve functioning solutions 		-Acrylic /forming & joining	-Card/ structural possibilities. movement				-Properties of hard / soft wood / pewter		-Material properties within practical work				-Joining methods
<ul style="list-style-type: none"> understand how more advanced mechanical systems used in their products enable changes in movement and force 			-Card mechanisms/ folding , transferring motion through mechanisms.	- Robotics -Transferring motion from motor to wheels.								-Mechanisms, moving parts within the product.	
<ul style="list-style-type: none"> understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs] 				-Programming input /output. -Line sensors.									-Electronical components -Soldering -inputs /outputs
<ul style="list-style-type: none"> apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors] and control outputs [for example, actuators] using programmable components [for example, microcontrollers] 				-Micro bits -Programming input /output. -Line sensors.							-CAD CAM skills Programming the laser cutter	-CAD CAM skills Programming the laser cutter	
Aims/Technical Knowledge: Cooking & Nutrition													
<ul style="list-style-type: none"> Understand and apply the principles of nutrition and health 	-Eatwell Guide, food diary -final design and make project -food allergy & intolerances						-Nutrients provided by the Eatwell Guide -Nutritional needs of different life stages -Fakeaway Project					-Spaghetti bolognese link -mini roast dinner link -chicken skewers -savory roly poly bread link	-food choice -multi-cultural cuisines -own choice menu
<ul style="list-style-type: none"> Cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet 	-pizza wheels -chicken nuggets -egg fried rice -savory seasonal scones					-Stir fry, -meatballs -spaghetti bolognese -Lasagne -cottage pie -fakeaways product					-spaghetti bolognese -mini roast dinner -chicken skewers -ravioli -Dim sum -chips & mayo -teriyaki chicken -savory roly poly bread -crumpets	-own choice dish has to be savoury product	
<ul style="list-style-type: none"> Become competent in a range of cooking techniques [for example, selecting and preparing ingredients, using utensils and electrical equipment. Applying heat in different ways, using awareness of taste, texture and smell to decide how to season dishes and combine ingredients, adapting and using their own recipes] 	-smoothie -pizza wheels -chicken nuggets -egg fried rice -savory seasonal scones					-Stir fry, -meatballs -spaghetti bolognese -Lasagne -cottage pie -fakeaways product					-spaghetti bolognese -mini roast dinner -chicken skewers -ravioli -Dim sum -chips & mayo -teriyaki chicken	-multi-cultural cuisines using a range of cooking methods	

	<p>End of Project Written Test / Practical Assessment which includes design brief, research, design development, making and evaluating.</p> <p>Knowledge: Hygiene & Safety Knife Skills – cutting techniques Nutrients provided by the Eatwell Guide Nutritional needs of different life stages Design brief, research, time planning and evaluation</p> <p>Skills: Weighing & Measuring – units of measurement, various measuring equipment (Stir fry, meatballs/spaghetti bolognese/lasagne/cottage pie, fakeaways product) Knife Skills – different grips and cutting techniques (Stir fry, meatballs/spaghetti bolognese/lasagne/cottage pie, fakeaways product) Food preparation – washing, peeling (Stir fry, meatballs/spaghetti bolognese/lasagne/cottage pie, fakeaways product) Applying heat – use of the hob, oven (Stir fry, meatballs/spaghetti bolognese/lasagne/cottage pie, fakeaways product) Awareness of taste (Stir fry, meatballs/spaghetti bolognese/lasagne/cottage pie, fakeaways product) Adapting/using own recipe – final design and make task (fakeaways product)</p> <p>GCSE Skill links for progression: S1: General Practical Skills, S2: Knife skills, S3: Preparing Fruit & Vegetables, S4: Use of the cooker, S5: Use of equipment, S6: Cooking Methods, S8: Sauce Making</p>	<p>Design development, making planning, making practical skills, Evaluating, and Technical knowledge.</p> <p>Knowledge: Knowledge of materials –Pine- soft & hard woods. Joining methods, wood glues, permanent and tempura fixture. Analysis of existing products. Generation of ideas and annotations. Planning for manufacture, selecting appropriate tooling and machinery. Metals and casting.</p> <p>Skills: A development of CAD CAM skills -2D design laser cutter. Lap joint, dowel joint mitre joints. Hand skills –cutting, shaping, and finishing techniques. Safe working with tools and machinery. Creative design. Evaluating.</p>	<p>Design development, making practical skills, Evaluating, and Technical knowledge.</p> <p>Knowledge: Creating a design brief and specification. Analysing existing products. CAD using 2D to plan and manufacture a product. Using the vacuum former to produce shapes.</p> <p>Creative design ideas of the packaging. Vacuum forming. Hand skills, clay modelling/ card prototyping. Use of CAD 2D design & Photoshop. Evaluating.</p>	<p>Client profile ,Design development, Orthographic drawing skill, Sketchup drawing /computer modelling ,2D design , making practical skills, Evaluating, and Technical knowledge.</p> <p>Knowledge: Client profile -identifying needs of the user. Varied methods of design techniques. Programming CAD CAM Materials knowledge Metals & Manufactured boards. Finishing skills</p> <p>Skills: Creative deign -generating design ideas using drawing skills and SketchUp Final design – orthographic drawing Working 2D design drawings for the laser cutter- use of varied colours. Operating the laser cutter. Marking /shaping /forming steal. Powder coating. Evaluation</p>
	<p>STEM links: Weigh & measure – reading scales Proportions – recipe modification/creation Use of charts and graphs Bacterial cross contamination Heat transfer Gelatinisation</p>	<p>STEM links: Origins of materials- Woods, metals – producing and casting. Environmental impact of the product Adhesives – PVA wood glue. Finishes – Polyurethane varnish plastics. Materials – Metals, pewter casting /forming. Practical skills – cutting, filling, joining methods, drilling. Measuring -making out Measurements / coordinates CAD Isometric drawing</p>	<p>STEM links: Environmental impact of the product – Printing process Adhesives Mechanisms – Transferring motion Measuring -making out Isometric drawing Drawing /measuring the box net</p>	<p>STEM links: Origins of materials- Manufactured boards, Steal. Environmental impact of the product Finishes – Polyurethane varnish plastics. Materials – Metals, Steal, acrylic Metal working skills, Material properties Knowledge of specialist workshop tools & equipment. CAM skills Measuring -Reading working drawings -making out Measurements / coordinates CAD Use of MM when designing in Sketchup.</p>
	<p>Cross curricular links: Science: Bacteria-cross contamination, Heat transfer Culture: range of ingredients, food choice – life stage Careers: food hygiene/industry, food nutrition</p>	<p>Cross curricular links: IT- 2D design /programming the laser cutter for engraving and mould making. Maths - Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing Science - Origins of materials- Woods, metals – producing and casting. Environmental impact of the product. Adhesives – PVA wood glue. Finishes – Polyurethane varnish plastics. Materials – Metals, pewter casting /forming. Art & design -generating design ideas</p> <p>Culture - material source, environmental impact, Carbon footprint, ethical design choices hardwood, softwood? Client /target market.</p>	<p>Cross curricular links: IT – 2D design / programming laser cutter for packaging. Designing packaging. Maths - Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing. Art & design -generating design ideas</p>	<p>Cross curricular links: IT- 2D design /programming the laser cutter Maths - Measurements, reading working drawings, marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing. Science - Origins of materials- Woods, metals –. Environmental impact of the product. Finishes – Polyurethane varnish plastics. Materials – Metals/ forming.</p>
	<p>Food & nutrition</p>	<p>Resistant Materials</p>	<p>Graphics</p>	<p>Cultural Food Project</p>
<p>Year 9</p>	<p>Food preparation and nutrition: Gold Level – working towards GCSE Assessment Task: End of Topic Test / Practical Assessment</p> <p>Knowledge: Students will learn the theory behind the 12 key practical skills as well as how to demonstrate them effectively and independently, linking these back to key concepts learned within Y7&8. S1: General Practical Skills – Spaghetti Bolognese: nutritional needs, traditional cuisines S2: Knife skills – Portioning a chicken: food provenance, food safety S3: Preparing Fruit & Vegetables – Mini roast chicken dinner: nutritional needs, seasonality, food provenance S4: Use of the cooker – Chicken Skewers: nutritional needs S5: Use of equipment – Ravioli Pasta: traditional cuisines S6: Cooking Methods – Dim Sum: Traditional cuisines S7: Prepare, shape & combine – Swiss roll: traditional cuisines, food choice S8: Sauce Making – Chips and Mayonnaise: food science, food choice S9: Tenderise & Marinade – Teriyaki Chicken: traditional cuisines S10: Dough – Savoury Roly Poly Bread: nutritional needs</p>	<p>How can mechanism give us a reward? Gumball dispenser Assessment Task: End of unit assessment Design development, making planning, making practical skills, Evaluating, and Technical knowledge.</p> <p>Knowledge: Mechanisms, modelling /prototyping, tool and technique selection CAD CAM 3.client profile 7.Design specification 8.Generating design ideas 21.Evaluationg against specification</p> <p>Skills: Problem solving, creative thinking. Specialist techniques. Tool selection – materials properties - manufacturing techniques.</p>	<p>How can we make materials talk? Speaker Assessment Task: End of unit assessment Design & making skills assessed by Design development, making planning, making practical skills, Evaluating, and Technical knowledge.</p> <p>Knowledge: Electronic - components, inputs & outputs. Knowledge of materials –acrylic and manufactured boards adhesives. 4.Product analysis 6.Design brief 8.Generating design ideas 20.Testing & evaluating Generation of ideas and annotations. Product evaluation.</p> <p>Skills: Electronics – soldering</p>	<p>Cultural Cuisines Assessment Task: Practical Assessment which includes design brief, research, design development, making and evaluating.</p> <p>Knowledge: Multi-cultural cuisine/traditional cuisines from around the world Multi-cultural ingredients Multi-cultural cooking methods Food Choice Menu Planning/time planning Evaluation and testing</p> <p>Skills: Research – multicultural foods/ingredients – develop into a focus on 1 culture Design – recipe choice and development to suit their brief Plan – time plan, possible problem solving Make – recipe 1 and 2 Evaluate – nutritional analysis, sensory analysis</p>

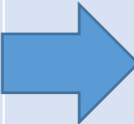

<p>S11: Raising Agents – Crumpets: traditional cuisine S12: Setting Mixture – Bread and butter pudding: seasonality, food science</p> <p>Skills: S1: General Practical Skills, S2: Knife skills, S3: Preparing Fruit & Vegetables, S4: Use of the cooker, S5: Use of equipment, S6: Cooking Methods, S7: Prepare, shape & combine, S8: Sauce Making, S9: Tenderise & Marinade, S10: Dough, S11: Raising Agents, S12: Setting Mixture.</p>	<p>A development of CAD CAM skills -Google SketchUp ,2D design laser cutter.</p>	<p>A development of CAD CAM skills -Google SketchUp ,2D design laser cutter. Creative design. Evaluating.</p>	<p>GCSE Skill links for progression: S1: General Practical Skills, S2: Knife skills, S3: Preparing Fruit & Vegetables, S4: Use of the cooker, S5: Use of equipment, S6: Cooking Methods, S7: Prepare, shape & combine, S8: Sauce Making, S9: Tenderise & Marinade, S10: Dough, S11: Raising Agents, S12: Setting Mixture.</p>
<p>STEM links: Weigh & measure – reading scales Proportions – recipe modification/creation Use of charts and graphs Bacterial cross contamination Heat transfer Emulsification</p>	<p>STEM links: Origins of materials- production of plastics Environmental impact Adhesives -liquid solvent Manufacturing skill – Machine /tool knowledge CAD CAM skills Measuring -making out Measurements / coordinates CAD Isometric drawing</p>	<p>STEM links: Electronics- soldering , components, inputs/outputs. Materials – environmental impact. Metal working skills, Material properties Knowledge of specialist workshop tools & equipment. CAM skills Measurements / coordinates CAD Use of MM when designing in Sketchup.</p>	<p>STEM links: Weigh & measure – reading scales Proportions – recipe modification/creation Use of charts and graphs Bacterial cross contamination Heat transfer</p>
<p>Cross curricular links: Science: Bacteria-cross contamination, Heat transfer, emulsification Culture: range of ingredients, food choice – life stage, celebration, traditional cuisines Careers: food hygiene/industry, food nutrition, food presentation</p>	<p>Cross curricular links: IT – Use of 2D design. Introduction to computer programming laser cutter. Maths – Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing Science - Origins of materials- production of plastics. Environmental impact . Adhesives -liquid solvent. Cultural – material source, environmental impact , ethical design choices , Client /target market,</p>	<p>Cross curricular links: IT- 2D design /programming the laser cutter for cutting box. Maths - Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing Science - Origins of materials- manufactured board , acrylic. Environmental impact of the product. Adhesives – PVA wood glue. Culture - material source, environmental impact, Carbon footprint, ethical design choices? Client /target market.</p>	<p>Cross curricular links: Science: Bacteria-cross contamination, Heat transfer, emulsification Geography: Multi-cultural foods Culture: range of ingredients, food choice – traditional cuisines Careers: food hygiene/industry, food nutrition, food presentation, recipe development</p>

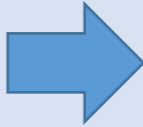
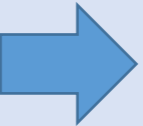
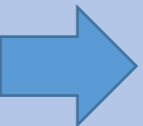
Related Documents


- Specification
- LTP's
- MTP's

Assessment Plan

<p>Curriculum Intent – Key Stage 4 Core</p> <p>1 – To enable pupils to develop a range of creative & practical skills, problem solving and confidence 2 – To build theoretical knowledge regarding materials to prepare for KS4 through homework tasks and testing 3 – To build confidence to allow pupils to be build their employability skills</p>	<p>Aims – National Curriculum</p> <p>1. Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. 2. Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users. 3. Critique, evaluate and test their ideas and products and the work of others.</p>	<p>Curriculum Intent – Key Stage 4 BTEC level 1&2 Technical awards On this course, you will:</p> <ol style="list-style-type: none"> learn about the key engineering sectors – mechanics, electrical/electronic and engineering design and how they contribute to industry develop key engineering practical and technical skills, such as research, observation, measurement, planning, making, using CAD and disassembly develop key skills for employment in engineering sectors, such as problem solving, design, creativity, communication and collaboration.
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Year 10				
	Autumn		Spring	Summer
<p>Year 10 Practical</p>	<p>Garden Hanging basket hook Creative design. Cutting shaping steel bar. Heating forming & finishing skills. CAD CAM</p>	<p>Bridge building analysing existing solutions Modelling ideas and testing Marking Cutting and shaping aluminium Riveting Team work Project planning product assembly</p>	<p>Component 1 Exploring Engineering sectors and design applications B1 Explore the design process Students will respond to a Customer design brief. They will: - research existing products -create a range of their own design ideas. -Model their ideas in both CAD and a range of materials. -identify QC areas -Manufacture product and review against the design brief.</p>	
<p>Year 10 Theory</p>	<p>Lesson focus Isometric drawing. Health & safety in workshop. Measuring & marking out. Tools and equipment in engineering. 2D design CNC router</p>	<p>Lesson focus Researching skill Collaborative working within engineering What is scale? Compression, tension and torsion. Joining methods Stages of manufacture.</p>	<p>Component 1 Exploring Engineering sectors and design applications While researching a local engineering project student will: A1 What are the different engineering sectors and how do they interconnect?</p>	

			-investigating the different engineering sectors, what role they play in the modern world, jobs that are available and potential career pathways. A2 Research Engineering organisations, functions, jobs and career progression.	
Year 10 Assessment	Yr 10 Autumn assessment Focus: Core principals /skills Materials and their properties. Manufacturing choices. Equipment.	Yr 10 Winter assessment Focus: Mathematics –Tech drawing 3 rd angle projection One point perspective Design/manufacture stages Percentages and ratios	Components 1 Learning aim A &B assessed against the examining body’s marking criteria.	
Year10 Homework	Creative homework Areas of Engineering Identify and explain 8 different areas of engineering. What jobs are available in each area? What role do they play in allowing us to go about our daily lives?	Creative homework Product disassembly With permission disassemble a produce from around your home. This could be anything from a very large or a tiny product. Photograph the product at various stages of assemble, label all components and suggest a material and method of manufacture	Controlled assessment Generating design ideas Developing design ideas Final design	Controlled assessment Realising design ideas
	STEM links: Origins of materials- Steal. Environmental impact of the product Finishes – Polyurethane varnish plastics. Materials – Metals, Steal, acrylic Metal working skills, Material properties Knowledge of specialist workshop tools & equipment. CAM skills Measuring -Reading working drawings -making out Measurements / coordinates CAD.	STEM links: Origins of materials- Manufactured boards, Steal. Environmental impact of the product Finishes – Polyurethane varnish plastics. Materials – Metals, Steal, acrylic Metal working skills, Material properties Knowledge of specialist workshop tools & equipment. CAM skills Measuring -Reading working drawings -making out Measurements / coordinates CAD Use of MM when designing in Sketchup.	STEM links: Exploring Engineering sectors and design applications	STEM links: Exploring Engineering sectors and design applications
	Cross curricular links: Maths – Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing Science - Origins of materials- production of metals. Environmental impact . Adhesives -liquid solvent. Cultural – material source, environmental impact , ethical design choices , Client /target market,	Cross curricular links: Maths – Measurements marking out practical work, measuring /estimating existing products. CAD drawing / coordinates. Isometric drawing Science - Origins of materials Cultural – material source, environmental impact , ethical design choices , Client /target market,	Cross curricular links: Careers – researching the different engineering sectors and jobs available within them. Business – Collaboration between companies. What do we class as small or large companies?	Cross curricular links: Careers – researching the different engineering sectors and jobs available within them. Business – Collaboration between companies. What do we class as small or large companies?
Year 11				
	Autumn		Spring	Summer
Year 11 Practical	Component 2 Investigating an engineering project C Plan the manufacture of and safely reproduce/inspect/test a given engineering component -Students will manufacture one aspect/component of the product that they disassembled. -Develop a production plan for the component they have made.		Component 3 Responding to an Engineering Brief B Provide a design solution for an engineered product against the needs of an engineering brief. -Interpretation of a given brief for an engineered product - Redesign - Evaluation C Provide solutions to meet the needs of an engineering brief -Analysing engineering information associated with the problem - Selecting a solution - Problem solution	
Year 11 Theory	Component 2 Investigating an engineering project A Understand materials, components and processes for a given engineering product. -Students will do this through investigating a given product -look at the components used to manufacture the product. -identifying the materials, manufacturing and assembly methods. B Investigate a given engineering product using disassembly techniques. -Students will do this through disassembling a given product. -Identifying properties of each of the individual components		Component 3 Responding to an Engineering Brief A Carry out a process to meet the needs of an engineering brief. - Carry out a process -Recording the process -Interpretation of data	

	-assessing design and specifics.		
Year 11 Assessment	Components 2 Learning aim A,B &C assessed against the examining body's marking criteria.	Component 3 Learning aim A , B & C assessed through mock exams provided by the awarding body. Practical investigations & recording results. Product development.	
Year11 Homework	Component 2 Investigating an engineering project Disassemble / assemble products	Component 3 Responding to an Engineering Brief Exam revision .	
	STEM links: Materials Properties of materials Design decisions Methods of manufacture – manufacturing processes Investigating an engineering project Measurements	STEM links: Graphs Recording results Interoperating results Interpretation of a given brief for an engineered product - Redesign - Evaluation Graphs Recording results Interoperating results	STEM links:
	Cross curricular links: Technology- Materials Properties of materials Design decisions Methods of manufacture – manufacturing processes Investigating an engineering project Mathematics- measurements	Cross curricular links: Science /Mathematics – Graphs Recording results Interoperating results Design Technology Interpretation of a given brief for an engineered product - Redesign - Evaluation	Cross curricular links: