

Medium Term Planning

<p style="text-align: center;">Rotations: 10 x lessons Autumn 1 (8 weeks), Autumn 2 (7 weeks), Spring 1 (5 weeks)</p> <p style="text-align: center;"><i>Options rotations – broad overview of what the course contains:</i></p> <ul style="list-style-type: none"> • <i>What is engineering?</i> • <i>LEAN processes.</i> • <i>Reverse Engineering.</i> • <i>Lego production line</i> <ul style="list-style-type: none"> • <i>Mini Project 3.4.1 Basic Modelling and calculating & Introduction to SOLIDWORKS. (Computer room needed)</i> • <i>CAD & manufacturing a simple part for Greenpower F24+ car. (Nylon steering wheel plug).</i> 							
Learning Objectives	Lesson task	Resources & equipment	Homework	Assessment	Textbook references	CLEAPSS	
	<i>Training day</i>						
	<i>Year 9 not in school</i>						
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1	<p>Understand the expectations of the GCSE Engineering course.</p> <p>Understand the LEAN process</p> <p>Analyse the current NEA to come up with initial solutions to the issue.</p>	<p><i>Single lesson</i></p> <p>Starter: Seating plan, hand out paper get equipment ready.</p> <p>Main: Get students to write down what they think engineering is. Introduce GCSE Engineering course using the power point. Discuss how the course is set up and delivered. Assessment, Core and Specialist Technical principles.</p> <p>Explain what engineering is.</p> <p>Discuss LEAN Practice.</p> <p>Introduce the NEA question: 'Problem Many people need reliable devices to help improve their independent living or to cope with medical conditions. Your task is to engineer a device or system that would help support independent living. Three examples of possible solutions Engineer a prototype device that would retrieve an object that the user could not reach or hold without the device. Engineer a prototype device that would aid memory and support cognitive thinking. Engineer a device or system that would help someone to be more active when living independently.</p> <p>Plenary: Discuss the needs of the people seen in the video clip.</p>	<p>Power point</p> <p>Paper</p> <p>Paper clips</p> <p>Rulers</p> <p>Text books</p>		<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of the analysis</p>	<p>Page 190 - 193</p>	
2	<p>Intro to reverse engineering.</p> <p>Understand how to de-assemble a computer mouse.</p>	<p><i>Single lesson</i></p> <p>Starter: How do you build a computer mouse?</p> <p>Main: Reverse engineering an item (eg, Computer mouse) take it apart logically, set out and</p>	<p>Power point</p> <p>A3 Paper</p> <p>Rulers</p> <p>Drawing equipment</p>	<p>Gather a wide range of images of reverse engineering, include detailed annotation and</p>	<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of technical ability and</p>		<ul style="list-style-type: none"> • Hand tools, • Screwdrivers, • Mini screw drivers.

	<p>Create a logical set of instructions to re-assemble the computer mouse.</p> <p>Understand how this process could be Improved.</p>	<p>label the parts, photograph as you go along and then re-assemble correctly.</p> <p>Plenary: Use ACCESS FM approach to decide on how to improve design. Eg, could you do it simpler and achieve same product, could it be done cheaper and more efficiently?</p>	<p>Pencil Crayons & Felt tips</p> <p>Item to reverse engineer.</p>	<p>methods on how to do so.</p>	<p>logical processing.</p>		
3	<p>Recall previous lessons skills on reverse engineering.</p> <p>Able to reverse engineer different everyday items.</p> <p>Explain logically how to put them back together correctly.</p>	<p><i>Single lesson</i> Starter: How do you build a computer keyboard in order?</p> <p>Main: Reverse engineering an item – randomly assigned on desk. Students then make a set of instructions to put it back together in order.</p> <p>Plenary: Using ACCESS FM how could the process be improved?</p>	<p>Power point A3 Paper Rulers Drawing equipment Pencil Crayons & Felt tips</p> <p>Items to reverse engineer.</p>		<p>Response to questioning. Observation</p> <p>Teacher assessment of technical ability and logical processing.</p>		<ul style="list-style-type: none"> • Hand tools, • Screwdrivers, • Mini screw drivers.
4	<p>LEAN LEGO aircraft manufacturing.</p>	<p><i>Single lesson</i> Starter: How are cars built – does one person build the whole thing?</p> <p>Main: Find effective ways to create a manufacturing line, how do you make the process more efficient. Student lead and solution lead. Winner to be decided for most efficient, controlled and productive line.</p> <p>Plenary: <i>How did the winning team achieve their success?</i></p>	<p>Power point A4 Paper Rulers Drawing equipment Pencil Crayons & Felt tips</p> <p>LEGO sets</p>		<p>Response to questioning. Observation</p> <p>Teacher assessment of technical ability and logical processing.</p>		
5	<p>Introduction to CAD (Solidworks)</p> <p>Able to create 2D drawings</p>	<p><i>Two lessons</i> Starter: What is CAD and its uses?</p> <p>Main: Follow instruction of teacher – step by step.</p>	<p>Computer room. Solidworks software.</p>		<p>Response to questioning. Observation</p> <p>Teacher assessment of technical ability and logical processing.</p>		
6	<p>Able to create 3D parts</p> <p>Able to create and assembly from 2 or more parts</p> <p>Create technical drawings from CAD parts.</p> <p>Able to use a technical drawing to create a 3D part in CAD.</p>	<p>- Making simple 2D shapes. - Creating 3D shapes - Advanced 2D & 3D features - Making an assembly from 2 parts. - Creating a part drawing. - Creating a part from technical drawing.</p> <p>Plenary: N/A</p>			<p>Finished drawing / model.</p>		
7	<p>Create a real-world object in</p>	<p><i>One lesson</i> Starter:</p>	<p>Computer room</p>		<p>Response to questioning.</p>		

	CAD – eg, your mobile phone.	Name some CAD features we used last lesson. Main: Using measuring tools create a 2D and then 3D CAD model of your mobile phone. Then create a drawing from this part. Plenary: N/A	Paper Drawing tools Solidworks software.		Observation Teacher assessment of technical ability and logical processing. Finished drawing.		
8	Design and Manufacture a part for the Greenpower F24 car. (Steering wheel bung) Able to take measurements from an object. Able to translate these into CAD software. Manufacture the object from your drawings to tolerance.	2 lessons Starter: Name some CAD features we used last lesson. Main: Measure the gap on top of steering wheel and create a CAD model, print off drawings and then manufacture. Plenary: N/A	Computer room Solidworks software Workshop Steering wheel F24 car Nylon rod Lathe Hack saw Steel Rulers Compasses		Response to questioning. Observation Teacher assessment of technical ability and logical processing. Finished product.		Lathe Hacksaw
9							
10	Fill in lesson if required	<i>CAD modelling challenge</i> <i>Create assembly from drawings.</i> <i>First to complete.</i>	Computer room.		Response to questioning. Observation Teacher assessment of technical ability and logical processing. Finished model.		
End of Rotations Spring 2 (5 weeks) 22 x Lessons? Introduction to Engineering. Lab/workshop safety 3.1 Engineering materials. - 3.1.1.1 Metals and Alloys - 3.1.1.2 Polymers - 3.1.1.3 Composites - 3.1.1.4 Other Materials 3.1.2 Material Costs and supply. 3.1.3 Factors influencing design of solutions.							
	Learning Objectives	Lesson task	Resources & equipment	Homework	Assessment	Textbook references	CLEAPSS
1	Introduction to Engineering. Lab/workshop safety	Starter: <i>Hand out specifications and folders etc, Front of folders they write what type of engineering is the most interesting to them and why?</i> Main: <i>Talk through course plan and what is expected.</i>	Folders Lined paper punched ream. Any Hodder workbooks students have bought.		Response to questioning.	Teacher 200 -214	

Commented [JB1]: Useful links

[Specialist technical principles - GCSE Design and Technology Revision - AQA - BBC Bitesize](#)

		<p>Students need calculators and drawing equipment every lesson!</p> <ul style="list-style-type: none"> - Key words/Terms are to be boxed and highlighted neatly. <p>Lab and workshop safety briefing and best practice.</p> <ul style="list-style-type: none"> - Students complete risk assessment. 	Specifications printed.				
2	3.1.1 Materials and their properties.	<p>Starter: What are material properties – can you give any?</p> <p>Main: Groups/classifications of engineering materials based upon their physical appearance and properties.</p> <p>Understanding the behavioural characteristics of these materials during machining/handling.</p> <p>Plenary: Identify 5 engineered products in the classroom. For each identify the properties that are important for the product to be able to carry out the task it was designed to do.</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>Hodder textbooks Class and revision.</p>	Page 2	<p>Response to questioning.</p> <p>Observation</p> <p>Plenary – peer assessed.</p>	<p>Teacher 2-5</p> <p>Student 1-2</p>	N/A
3	3.1.1.1 Metals and Alloys Types of metals and alloys	<p>Starter: Identify some Ferrous and non-ferrous metals. Can you identify any alloys?</p> <p>Main: Identifying ferrous and non-ferrous metals and alloys including properties of each.</p> <p>How does the addition of materials to form alloys effect mechanical properties - Watch alloy types video Alloys: Types and Examples - YouTube</p> <p>Product research / design task – ironing board frame.</p> <p>Plenary: Activity on Page 8</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>Hodder textbooks Class and revision.</p>		<p>Response to questioning.</p> <p>Observation</p> <p>Self-assessed</p>	<p>Teacher 5-8</p> <p>Student 3-4</p>	
4	3.1.1.1 Metals and Alloys Changing the properties and structure of metal products	<p>Starter: Uses of metals.</p> <p>Main: How to modify the structure of metal and why it is done.</p> <p>How to change surface chemistry and why it is done.</p> <p>Addition and subtraction of carbon in steels.</p> <p>Plenary: Motorbike rear wheel sprocket – what would you make it out of and what treatment would you give it?</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>Hodder textbooks Class and revision.</p>	Page 5	<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of technical ability and logical processing.</p>	<p>Teacher 8-11</p> <p>Student 4-5</p>	

5	3.1.1.2 Polymers Thermoplastics and Thermosetting polymers	<p>Starter: <i>Uses of polymers.</i></p> <p>Main: <i>What are polymers</i> <i>Examples and properties of thermoplastics.</i> <i>Examples and properties of thermosetting polymers.</i> <i>Effects of heat on thermosets and thermoplastics.</i> <i>Structure of thermoplastics and thermosetting polymers.</i></p> <p>Plenary: <i>Examples of around the room – identify 5 products made from polymer. Activity Page 14</i></p>	Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision. Examples of polymers thermoplastic and thermosetting.	Page 7	Response to questioning. Observation Teacher assessment of technical ability and logical processing.	Teacher 12-14 Student 6-7	
6	3.1.1.3 Composites Composites	<p>Starter: <i>Identify examples of composites.</i></p> <p>Main: <i>What are composites & why are they used?</i> <i>Examples of composites.</i> <i>Changing properties of materials through direction/alignment, matrix, amount of reinforcement used as well as the size/shape used.</i></p> <p>Plenary: <i>Use the fact sheets & highlight / pick out key bits of technical information. Write why each type of composite it relevant for each of their potential uses outlined.</i></p>	Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision. Examples of composites My motorbike gloves.		Response to questioning. Observation Teacher assessment of technical ability and logical processing.	Teacher 15-16 Student 8	
7	3.1.1.4 Other Materials Timbers & Ceramics	<p>Starter: <i>What other materials are there?</i></p> <p>Main: <i>What is timber?</i> <i>What are ceramics?</i> <i>Properties of timber and ceramics and their uses due to these.</i></p> <p>Plenary: <i>Page 18 textbook.</i></p>	Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision. Examples of timber and ceramics.	Page 9	Response to questioning. Observation Teacher assessment of technical ability and logical processing.	Teacher 17-18 Student 9	
8	3.1.2 Material Costs and Supply Cost, Availability, Form & Supply	<p>Starter: <i>What is more expensive to buy? (Multiple choice questions).</i></p> <p>Main: <i>The comparative costs of different materials.</i> <i>Benefits to designers and manufacturers of having choice of materials to work with.</i></p>	Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision.	Page 11	Response to questioning. Observation Teacher assessment of technical ability and logical processing.	Teacher 19, 21, 22 Student 10-11	

		<p>Research task based around different countries and their native material resources / structures.</p> <p>Plenary: Provide and discuss three different examples to real world engineering problems around the world.</p>	Computer room.				
9	<p>3.1.2 Material Costs and Supply</p> <p>Calculation of costs to manufacture / produce items to inform the development of an engineering solution in industry.</p>	<p>Starter: How do we reduce costs of production?</p> <p>Main: Basic recap and worded calculations involving;</p> <ul style="list-style-type: none"> - E1 – Area of Rectangle, - E2 – Volume of Cuboid, - E3 – Area of Circle, - E4 – Volume of Cylinder, - E5 – Area of Triangle. <p>Available stock sizes and supply.</p> <p>Using economies of scale to reduce costs (Price breaks based on quantity).</p> <p>Waste produced and its affects.</p> <p>Plenary: House building sites are well known for producing large volumes of waste. In the current economic climate of falling house prices and rising costs, how can we reduce the cost of production?</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>Hodder textbooks Class and revision.</p>		<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of mathematical, technical ability and logical processing.</p>	<p>Teacher 19-20</p> <p>Student 10-11</p>	
10 (2 Lessons)	3.1.2 Material Costs and Supply	<p>Starter: Outline the research task – hand out product to each student along with a technical drawing (annotated)</p> <p>Main: Using the product, they were given at start of lesson and Table 1.2.1 on pg 21 of class text book to decide which materials they are going to use, the amount of material they will need and the costs.</p> <p>Plenary: Write an engineering report outlining their design intentions. Print this and put into folder.</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>Hodder textbooks Class and revision.</p> <p>Computer room.</p>		<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of technical ability and logical processing.</p>	<p>Teacher 19-23</p> <p>Student 10-11</p>	
11 (2 Lessons)	The ability of engineering materials to be machined, treated, shaped and recycled.						
12	<p>3.1.3 Factors Influencing Design of Solutions</p> <p>Energy Production methods</p>	<p>Starter: Thinking back to science lessons – how many energy production methods can you recall?</p> <p>Main: Energy Requirements for production.</p>	<p>Lined paper Punched Ream.</p> <p>Calculators</p> <p>Folders</p> <p>A3 paper</p>	Page 13	<p>Response to questioning.</p> <p>Observation</p> <p>Teacher assessment of technical ability and</p>	<p>Teacher 24 - 29</p> <p>Student 12-13</p>	

		<p>Sources of energy and their relevant advantages / disadvantages.</p> <p>Plenary: For each company and their location what energy sources are they going to use for production?</p>	<p>Hodder textbooks Class and revision.</p>		<p>logical processing.</p>		
13	<p>3.1.3 Factors Influencing Design of Solutions</p> <p>Engineering lifespans</p>	<p>Starter: List any products you use that you believe have engineering lifespans and what do you think their lifespan is?</p> <p>Main: Why do products have lifespans? What is planned obsolescence? Sealed parts. Maintenance requirements due to engineering lifespans. Real world examples.</p> <p>Plenary: Thinking back to starter, can you answer the activity on page 29.</p>	<p>Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision.</p>		<p>Response to questioning. Observation Teacher assessment of technical ability and logical processing.</p>	<p>Teacher 28 - 29 Student 14</p>	
14	<p>3.1.3 Factors Influencing Design of Solutions</p> <p>The need for and methods of maintenance of engineered products.</p>	<p>Starter: What is maintenance and why do we need to carry it out?</p> <p>Main: The need for maintenance of engineered products to; - Ensure safety in operation - Enable efficiency of operation. Types of maintenance work and their reasons; - Lubrication - Corrosion avoidance - Wear compensation - End of life (EOL), disposal and recovery of materials. - Real world examples in the aviation sector. Not just distance, but also hours flown and general passing of time.</p> <p>Plenary: Page 30 question.</p>	<p>Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision.</p>		<p>Response to questioning. Observation Teacher assessment of technical ability and logical processing.</p>	<p>Teacher 29 - 30 Student 14 - 15</p>	
15	<p>3.1.3 Factors Influencing Design of Solutions</p>	<p>Starter: What could affect the cost of a material?</p>	<p>Lined paper Punched Ream.</p>		<p>Response to questioning.</p>	<p>Teacher 19-23, 31</p>	MRAT037
16	<p>Engineering solutions to user requirements and how these can be inhibited by availability and forms of materials.</p>	<p>Main: Case study around F24 car – students are to address my teams F24 requirements and budget and come up with a solution to my design conundrum (Could change yearly) whilst addressing my needs and if not possible, giving me valid engineered solutions in response.</p>	<p>Calculators Folders Hodder textbooks Class and revision. F24 car tech drawings.</p>		<p>Observation Teacher assessment of technical ability and logical processing.</p>	<p>Student 10,11, 15</p>	
17							

		Plenary: <i>Print off and put into folder.</i>	Computer room. Workshop				
18	End of Term project assessment & Feedback	Main: <i>Make corrections to assessment.</i>				Teacher Student	
Summer 1 (7 weeks) 22 x Lessons? 3.3 Systems - 3.3.1 Mechanical Systems - 3.3.2 Electrical Systems - 3.3.3 Electronic Systems - 3.3.4 Structural systems - 3.3.5 Pneumatic systems							
19	3.3 Systems 3.3.1 Mechanical Systems (2 lessons?)	Starter: <i>Complete flow chart for quality control process. Using the following statements.</i> - Start - Is it too rough? - Inspect surface finish - Stop - File the part down - Yes - No - Accept and move to next process Main: - 3 common types of linkage and how they work (Make them also) - Calculating mechanical advantage - Four main types of motion - How gear trains work - Gear ratio calculations - Alternatives to gear trains / chain and sprockets - Types of cams and followers and their uses. (demo) - How pulleys work - Pulley systems: Velocity ratios - Lifting loads with pulleys and calculating their mechanical advantage. (practical) - Types of bearings and their uses. Plenary: <i>Q 1 – 5 Page 79 class book</i>	Lined paper Punched Ream. Calculators Folders Hodder textbooks Class and revision. Lollypop sticks (drilled either end) & Split pins Cams and followers demo models. Pulleys, string & slotted masses			Teacher 72-79 Student 38-41	
20							
21	3.3 Systems 3.3.2 Electrical Systems (2 lessons?)	Starter: <i>Draw a simple circuit for how to power a lamp that can be turned on and off.</i> Main:				Teacher 80-84 Student 42-43	

22		<ul style="list-style-type: none"> - What is electrical current & its equation. - Ohms Law - AC vs DC - Types of power supply (mains / battery) - Input control devices - Output devices - Buzzers and bells - Lamps <p>Plenary: Q1-4 Page 84</p>				
23	3.3 Systems	<p>Starter: Recall Questions</p> <p>Main: Analogue and digital signals</p> <ul style="list-style-type: none"> - Sensor inputs (LDR, Thermistors) - Process devices (Timers, Counters, Comparators) - Logic Gates (AND, NOT, OR) - Programmable Devices (Microcontrollers, Peripheral interface controller, Analogue to digital conversion) - Interfacing components (Transistors, Field effect transistors). - Output components (LEDs, 7 segment displays, Piezo sounder) - Discrete components within a circuit (Resistors, variable resistors, diodes, capacitors) - Simple programming for monitoring and control processes. <p>Plenary: Q1-5 Page 96</p>			Teacher 85-96	
24	3.3.3 Electronic Systems (3 lessons)				Student 44-49	
25						
26	3.3 Systems	<p>Starter: Recall Qs</p> <p>Main:</p> <ul style="list-style-type: none"> - Structural systems - Load and stress - Static and dynamic loads - Structural stresses (tensile & compressive) - Space frame structures - Monocoque structures <p>Investigate the use of space frame and monocoque structures – give advantages and disadvantages of each.</p> <p>Lesson 3 - Bridge Building Project</p> <ul style="list-style-type: none"> - Working in teams, build a trussed 			Teacher 97 – 99	
27	3.3.4 Structural systems				Student 50 - 51	
28	Project – Bridge Building and testing					

		<p>structure from lightweight materials e.g., balsa, paper and thin card, and destructively test.</p> <ul style="list-style-type: none"> - Calculating factor of safety, weight/load ratio. - Analysing failed structure for evidence of compression failures, distortion and buckling under load. <p>Plenary: Qs 1-3 Page 99</p>				
27	3.3 Systems	<p>Starter: Recall Qs</p> <p>Main:</p> <ul style="list-style-type: none"> - Difference between Pneumatic and hydraulic systems <p>Pneumatic systems</p> <ul style="list-style-type: none"> - Single and double acting cylinders - Calculating force - Delay circuits, Logic circuits - Applications of Pneumatics <p>Plenary: Qs 1-4 Page 103</p>			Teacher 100 - 103	
28	3.3.5 Pneumatic systems				Student 52 - 53	
29	Assessment Engineering Materials and Systems	Pages 32 & 104 from class textbook			Teacher	
<p>Summer 2 (7 weeks) 22 x Lessons?</p> <p>3.2 Engineering Manufacturing Processes.</p> <ul style="list-style-type: none"> - 3.2.1 Additive Manufacturing - 3.2.2 Material Removal - 3.2.3 Shaping, Forming & Manipulation - 3.2.4 Casting & Moulding - 3.2.5 Jointing and Assembly - 3.2.6 Heat and Chemical Treatment - 3.2.7 Surface Finishing. <p>3.5 The impact of modern technologies</p> <p>Solidworks workshop and CAD Project (Basics).</p>						
30	3.2 Engineering manufacturing processes.	<p>Starter: Recall Q's</p> <p>Main:</p> <ul style="list-style-type: none"> - How metal products are made by sintering - Rapid prototyping processes used with polymers. - How fused deposition is used to make products. - How stereolithography is used to make polymer products. <p>Plenary: Write an article on how rapid prototyping will change the</p>			Teacher 34 – 36	
	3.2.1 Additive Manufacturing				Student 17 - 18	

		way we manufacture products in the future.				
31	3.2 Engineering manufacturing processes. 3.2.2 Material Removal	<p>Starter: Recall Q's</p> <p>Main:</p> <ul style="list-style-type: none"> - The tools and machines used to cut material by sawing, shearing and laser cutting. - The uses of a lathe including turning and boring. - The uses of a mill including facing and slotting. - Types of drill. - How chemical etching is used to manufacture printed circuit boards. <p>Plenary:</p> <ul style="list-style-type: none"> - Refer to pages 37 to 43 of textbook and complete the "Material Removal" worksheet. - To help with understanding of chemical etching visit link below: Technology Student - PCB Manufacture - Complete "Check your knowledge & understanding" on page 43 of textbook. <p>Practical (assessment) –(3 - 4 Lessons)</p> <ul style="list-style-type: none"> - Lathe turning aluminium round bar - Sheet aluminium box 			Teacher 37 – 43 Student 19 - 21	- MRAT 037 - MRAT 154 - Bench-Mounted Cutting Tools - MRAT 012 - Cutting and Shaping Metal By Hand - MRAT 204 - General Hand Tools
32	3.2 Engineering manufacturing processes. 3.2.3 Shaping, Forming & Manipulation	<p>Starter: Recall Q's</p> <p>Main:</p> <ul style="list-style-type: none"> - The equipment used to bend and fold sheets of material. - How press forming, punching and stamping are used to manufacture parts. - How composite materials are manufactured using lay-up method. <p>Plenary:</p> <ul style="list-style-type: none"> - Refer to pages 44 to 48 of textbook and complete the "Shaping by Forming & Manipulation" worksheet. - Complete "Check your knowledge & understanding" on page 48 of textbook in your exercise book. 			Teacher 44 – 48 Student 22 - 24	-
33	3.2 Engineering manufacturing processes.	<p>Starter: Recall Qs</p> <p>Main:</p>			Teacher 48 – 52 Student	

	3.2.4 Casting & Moulding	<ul style="list-style-type: none"> - How sand casting and pressure die casting are used to make products from metal. - The differences between the moulds used for sand casting and pressure die casting. - How injection moulding is used to make products from polymer. <p>Plenary:</p> <ul style="list-style-type: none"> - With reference to pages 49 to 52 of textbook, complete the "Casting & Moulding" worksheet. - With reference to pages 49 to 52 of textbook, complete the workbook questions on Casting and Moulding. 				25 - 29	
34	3.2 Engineering manufacturing processes. 3.2.5 Jointing and Assembly	<p>Starter: Recall Qs.</p> <p>Main:</p> <ul style="list-style-type: none"> - The types of threaded fastenings used to attach materials together and the reasons why they may be selected for an application. - How riveting is used to join sheets of material together. - The differences between soft and hard soldering, brazing and welding and how these processes are used to join materials together. <p>Plenary:</p> <ul style="list-style-type: none"> - Read through the following pages and text book pages 53 to 59. Complete Joining & Assembly worksheet. - Complete "check your knowledge & understanding" questions from green box on page 59. Complete the table activity too. 				Teacher Student 30 - 32	
35	3.2 Engineering manufacturing processes. 3.2.6 Heat and Chemical Treatment	<p>Starter:</p> <p>Main:</p> <p>Plenary:</p>				Teacher Student 33 - 34	
36	3.2 Engineering manufacturing processes. 3.2.7 Surface Finishing.	<p>Starter:</p> <p>Main:</p> <p>Plenary:</p>				Teacher Student 35 - 36	

37	Assessment – Engineering Manufacturing Processes						
38	3.5 The impact of modern technologies	<u>Starter:</u> <u>Main:</u> <u>Plenary:</u>				Teacher Student	