



**Engineering**  
**Year 10 & 11**  
**Curriculum Journey**  
**2021 – 2022**

<b>Subject: GCSE Engineering</b>		
<b>Year group: 10</b>		<b>Exam Board: AQA</b>
	<b>Content</b>	<b>Department Assessment</b>
<b>Autumn Term 1</b>	<p><b>Electronics and electrical principles</b></p> <p>Students will be introduced to: Electrical principles, e.g. Ohms law, resistance, potential dividers.</p> <p>Electronics components and how they function in circuits.            Designing (using a Systems approach), constructing, and testing electronic circuits.            Looking at circuit design in terms of input, process, output</p>	Assessment will be through Homework and end of term tests
<b>Autumn Term 2</b>	<p>Using a circuit design package and simulation package eg Circuit Wizard, Picaxe editor</p> <p>Physical, modelling, using prototyping board for circuit construction and testing.</p> <p><b>Working with metals.</b>            Students will learn about:            workshop processes</p> <ul style="list-style-type: none"> <li>• cutting</li> <li>• turning</li> <li>• drilling</li> </ul>	
<b>Spring Term 1</b>	<p>Quality control methods, working to tolerances, checking using Vernier calipers/micrometer.            Following production plans.</p> <p><b>Understanding materials such as:</b>            Students will learn about:            Polymers, types and properties            Composites and reinforcements            Timber: structural grade timber, selection and testing, uses            Ceramics: advantages and disadvantages            Heat treatment of metals.            Avoiding corrosion and finishes:            Make it go faster?</p> <p>Introduction to the aerodynamic concept of thrust, drag and lift and applications.</p>	

<p><b>Spring Term 2</b></p>	<p>Production methods, automation, robotics and their social impact. The environment/pollution in cities, visual impact in the countryside. Making a casting/moulding sand casting , terminology, incl. Building a bridge Calculating factor of safety, weight/load ratio, destructive testing</p>	<p>Assessment will be through Homework</p>
<p><b>Summer Term 1</b></p>	<p>Systems: building a small robot  Short task using a combination of mechanical and electronic devices, applying knowledge and understanding about: Sensing, using sensors (as available) to detect and measure.  Mechanisms: Transmitting power using shafts, gearing systems, belts and pulleys, chains and sprockets. Linkages, push-pull, bell crank, cranks and four bar mechanisms including crank-slider, parallel motion cams and bearings.  Pneumatics: single and double acting cylinders, control and check valves.</p>	<p>Short engineered project</p>
<p><b>Summer Term 2</b></p>	<p>Mock exam Revision and exam preparation starts Planning for the NEA Problem solving Using a logical and systematic approach to designing Analysing and evaluating existing solutions to problems</p>	<p>Monitoring coursework and providing generic feedback</p>
<p><b>Homework</b></p>	<p>Homework will be set weekly, depending upon the modules being taught</p>	
<p><b>Subject / Department KeyTerms</b></p>	<p>PEE (Point.Evidence.Explain); WISE (Write.identify.Substitute.Ensure) 123, FLE(Fulcrum, Load, Effort); Iterations; SCAMPER(Substitute, combine, adapt, modify, put to other uses, eliminate, rearrange) cope, drag, pourer, riser, factor of safety; Stress, Strain and Young’s modulus; FoS- factor of safety; PIC-peripheral interface controller.</p>	
<p><b>Recommended Reading / Viewing</b></p>	<p>My Revision Notes: AQA GCSE (9-1) Engineering Student eTextbook; Paul Anderson, David Hills-Taylor; ISBN: 9781398315297;  AQA GCSE (9-1) Engineering Paperback – 29 Mar. 2018; Paul Anderson (Author), David Hills-Taylor (Author), Mark Griffiths (Contributor)</p>	
<p><b>How can technology help in this subject?</b></p>	<p>Internet: -research and investigation. CAD – Designing and simulating: circuits; mechanisms and products CAM- for programming CNC machinery to produce products. BBC micro/RaspberryPi /arduino/ -controlling devices.</p>	

<b>Skills required to succeed in this subject...</b>	Problem solving skills; Good English, Mathematical, Coding, investigative, an ability to use tools and equipment safely and accurately; Computer literacy
<b>Vision for this subject...</b>	<p>Pupils will develop their understanding of engineering and go on to study a level 3 engineering or product design course, leading to a career in engineering or designing.</p> <p>This course will provide pupils with skills valued by engineering employers and so it will help pupils towards attaining an engineering, or an allied field, apprenticeship.</p>

## Subject: GCSE Engineering

Year group: 11

Exam Board: AQA

	Content	Department Assessment
<b>Autumn Term 1</b>	NEA problem description & analysis and specification. Methods of developing ideas. Drawing Techniques Generating design ideas – circuits, systems blocks; including Testing and evaluation. <b>Looking at Mocks-ups and Models Design Development, Mock-ups and Models. Circuits and system blocks; Testing and evaluation.</b> Materials and their properties. Looking at detailing of the solution and producing production drawings - CAD Production of Orthographic Drawings / Production drawing and cutting list Revision-Manufacturing techniques	Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements.
<b>Autumn Term 2</b>	Revision-Manufacturing, Measuring and comparator tools/ mechanical systems/structures Revision-Electronic Systems Y11 AUTUMN EXAMS Production of Orthographic Drawings / Production drawing and cutting list Developing a Manufacturing Specification / Developing Gantt Chart for Planning Production planning Assembly of Materials.	November Mock exam  Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements.
<b>Spring Term 1</b>	Production Suggested production methods (alternative methods to manufacture), processes and techniques for making the final outcome Final Hand in (completed CW folder with final Testing and evaluation)	Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements
<b>Spring Term 2</b>	Exam Revision Final Coursework Marks Given	
<b>Summer Term 1</b>	Exam Revision  Final Exam	

<p><b>Homework</b></p>	<p>Homework will be the reworking of specific pieces of coursework as directed by the teacher.</p>
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<p><b>How can technology help in this subject?</b></p>	<p>Internet: -Investigating and researching iterations</p> <p>CAD – Designing and simulating: circuits; mechanisms and products</p> <p>CAM- for programming CNC machinery to produce products.</p>
<p><b>Skills required to succeed in this subject...</b></p>	<p>Problem solving skills; Good English, Mathematical, Coding, investigative, CAD Draughting skills.</p>
<p><b>Vision for this subject...</b></p>	<p>Pupils will develop their understanding of engineering and go on to study a level 3 engineering or product design course, leading to a career in engineering or designing.</p> <p>This course will provide pupils with skills valued by engineering employers and so it will help pupils towards attaining an engineering, or an allied field, apprenticeship.</p>