

# Subject Curriculum Information Pack



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# Curriculum Intent



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## **Curriculum statement: GCSE Engineering Design**

### **Intent**

We are surrounded by products that have been created to solve a particular problem. These engineering designs do not magically appear; they are typically developed by following a design strategy or process. GCSE Engineering Design inspires and equips students with the confidence to use skills that are relevant to the sector and more widely. It covers the design process, types of drawings, influences on design, and the use of computer-aided design (CAD) in Engineering.

### **Implementation**

On this course students will learn about the different design strategies and where they are used, they will learn about the type of information needed to develop a design brief and specification, and the manufacturing and other considerations that can influence a design. They will develop knowledge of the types of drawing used in engineering to communicate designs, as well as the techniques used to evaluate design ideas and outcomes, including modelling methods.

Our curriculum will provide students with opportunities to:

- Develop lifelong practical skills that will enable them to repair, design and make in their lives outside of Pedmore High School
- Engage in hands on learning in workshops, design studios and ICT suites
- Develop underlying knowledge of the theory that clearly relates to the practice taking place
- Witness their teachers modelling best practice, whether designing or making
- Work alongside teachers who actively challenge and support them to achieve their potential
- Engage in educational visits where they get to see the subject in real life, therefore leading to greater understanding of careers and exposing them to potential jobs or further education
- Develop their knowledge, understanding and skills that will enable them to pursue their dreams and ambitions beyond Pedmore High School

Assessment is carried out throughout the year through regular and timely formative assessments in class as well as summative assessments linked to the individual Non-Examined Assessment (NEA) unit of study.

### **Impact**

This qualification also allows students the opportunity to gain broad, transferable skills and experiences that can be applied as they progress into their next stages of study and life and to enhance their preparation for future employment. Students will have the opportunity to develop the following skills that are transferable.

These skills will help students to progress onto further study in the engineering design and development sector. This may be Level 3 vocational qualifications, such as the Cambridge Technical in Engineering, A Levels, such as A Level Design and Technology, or one of the number of Design and Development Technician Apprenticeships.

# Year 10 Curriculum Assessment Map



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## Curriculum Assessment Map: Year 10 Engineering Design

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Topic	R038 & R039	R038 & R039	R038 & R039	R038 & R039	R038 & R039	R038 & R039
<b>Key Learning &amp; Skills</b>	<p>R039: Introduction to manual production of freehand sketches Introduction to isometric drawing using perspective. Design strategies that include: linear, iterative, inclusive, user-centered, sustainable and ergonomic design. Stages and strategies of the design process.</p> <p>Use of computer aided design (CAD)</p>	<p>R038: Sketching and drawing, CAD. Researching production, analyse products through disassembly, brief and specification, modelling design ideas, ACCESS FM, Production methods and processes, standards, sustainability, types of modelling, user testing, evaluation.</p> <p>R039: Sketching design ideas activity</p> <p>Manual production of engineering drawings Stages and strategies of the design process.</p> <p>Use of computer aided design (CAD)</p>	<p>R038: Sketching and drawing, CAD R039: Drawing design ideas activity</p> <p>R039: NEA Assessment (working on)</p> <p>Principles of engineering design In this unit you will learn about the design process, and all of the stages that are involved. Topics include:</p> <ul style="list-style-type: none"> <li>o Designing processes</li> <li>o Designing requirements</li> <li>o Communicating design outcomes</li> <li>o Evaluating design ideas</li> </ul>	<p>R038: Sketching and drawing, CAD</p> <p>R039: Producing CAD models activity</p> <p>3D Printing concepts.</p> <p>R039: NEA Assessment (working on)</p> <p>Introduced to Health and Safety in the workshop and PPE.</p> <ul style="list-style-type: none"> <li>-Planning stages for practical's.</li> <li>-The use of different hand tools/machines.</li> <li>- PPE when working with tools, machines, materials, chemicals, finishes &amp; solvents</li> </ul>	<p>R038: Influences on engineering product design</p> <p>R039: NEA Assessment (working on)</p> <ul style="list-style-type: none"> <li>-The importance of design around anthropometric and ergonomics.</li> <li>-6 R's and learning in depth around sustainability and the importance of it.</li> <li>- Practical's in the workshop, building skills using hand tools and industrial machines to construct their prototype.</li> </ul>	<p>R038: Make, model and evaluate; virtual and physical prototypes</p> <ul style="list-style-type: none"> <li>-Practice exam past papers. Revise topics for R038 exam</li> <li>-Learning and understanding new and emerging materials and explain what their uses are.</li> <li>-Function, safety &amp; how they are influenced by the target audience.</li> <li>-6 R's and learning in depth around sustainability and the importance of it.</li> <li>-Students to research and create exam style questions for peers to complete.</li> </ul> <p>R039: NEA Assessment (submit for moderation)</p>
<b>End points</b>	Ongoing assessment of coursework	End of unit tests where applicable	Ongoing assessment of coursework	End of unit tests where applicable	Ongoing assessment of coursework	End of unit tests where Applicable and mock exam
<b>Informal (formative) Assessment</b>	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions
<b>Formal (summative) Assessment</b>	<ul style="list-style-type: none"> <li>- R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>	<ul style="list-style-type: none"> <li>-R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>	<ul style="list-style-type: none"> <li>- R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>	<ul style="list-style-type: none"> <li>- R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>	<ul style="list-style-type: none"> <li>- R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>	<ul style="list-style-type: none"> <li>- R038 Topic tests and past papers</li> <li>- Year 10 end of summer mock</li> <li>- Completion of R039 NEA</li> <li>- Homework tasks</li> </ul>

# Year 11 Curriculum Assessment Map



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## Curriculum Assessment Map: Year 11 Engineering Design

	<b>Autumn Term 1</b>	<b>Autumn Term 2</b>	<b>Spring Term 1</b>	<b>Spring Term 2</b>	<b>Summer Term 1</b>
<b>Topic</b>	<b>R108: 3D design realisation</b>	<b>Unit R106: Product analysis and research</b> <b>Unit R105: Design briefs, design specifications and user requirements</b>	<b>Unit R106: Product analysis and research</b> <b>Unit R105: Design briefs, design specifications and user requirements</b>	<b>Unit R106: Product analysis and research</b> <b>Unit R105: Design briefs, design specifications and user requirements</b>	<b>Unit R105: Design briefs, design specifications and user requirements</b>
<b>Key Learning &amp; Skills</b>	3D Design Realisation LO1: Know how to plan the making of a prototype LO2: Understand safe working practices used when making a prototype LO3: Produce a prototype of a children's camera set dimensions and tolerances using a detailed specification LO4: Evaluate the success of the manufacture of the camera against set criteria including dimensions and quality of finish	R106: LO1 Learn commercial production methods, quality and legislation and their impact on products and components R105: -Preparation for exam based unit  Students continue building on revision -New and emerging technologies -Use of materials at end of life	R106: LO2 Be able to research existing products (x6 bike lights) R106: LO3 Be able to analyse existing products through disassembly -Preparation for exam based unit  Students continue building on revision	R106: Completion of unit R105: Preparation for exam based unit Design briefs, design specifications and user requirements <b>APPLIES ONLY FOR SITTING OF SECOND EXAM AND RESUBMISSION OF OTHER UNITS</b>  Students continue building on revision	R105: Preparation for exam based unit  Design briefs, design specifications and user requirements
<b>End points</b>	Students to complete R108 3D design realisation  -Know how to plan the making of a prototype - Understand safe working practices used when making a prototype - Be able to produce a prototype - Be able to evaluate the success of a prototype	Unit R106: Product analysis and research  - Know how commercial production methods, quality and legislation impact on the design of products and components - Be able to research existing products - Be able to analyse an existing product through disassembly -Sustainable design -Life Cycle Analysis (LCA)	Unit R106: Product analysis and research  - Know how commercial production methods, quality and legislation impact on the design of products and components - Be able to research existing products - Be able to analyse an existing product through disassembly	Students to have completed all of <b>NEA R106 unit and final teacher assessment</b>  Unit R105: Design briefs, design specifications and user requirements -Understand the design cycle and the relationship between design briefs and design specifications	Unit R105: Design briefs, design specifications and user requirements -Understand the requirements of design specifications for the development of a new product -Know about the wider influences on the design of new products
<b>Informal (formative) Assessment</b>	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions	Starters and plenaries, paired work, GRIT tasks and verbal feedback, practice questions
<b>Formal (summative) Assessment</b>	- R105 Topic tests and past papers - Year 11 exam - Completion of R108 NEA - Homework tasks	- R105 Topic tests and past papers - Year 11 exam - Completion of R106 NEA - Homework tasks	- R105 Topic tests and past papers - Year 11 exam - Completion of R106 NEA - Homework tasks	- R105 Topic tests and past papers - Year 11 exam - Completion of R106 NEA - Homework tasks	- R105 Topic tests and past papers - Year 11 exam - Completion of R106 NEA - Homework tasks



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