

## KS4 - GCSE Resistant Materials

GCSE Resistant Materials is an option subject at Key Stage 4 and is suitable for those who have enjoyed **both** the design and practical elements of Technology at Key Stage 3 and may be considering future careers in design based disciplines – product design, furniture design, architecture, 3D design, etc.

Students will be involved in a wide range of projects to build their skills throughout the course which will culminate in a GCSE coursework project of the students choosing, based on given theme areas, that will use all of the learnt skills to produce a design portfolio showing research, design, development and practical skills and a practical outcome.

Students should be fully aware that this IS NOT just a practical subject, as it involves a wide range of written, analytical, design and documentary elements that must be completed if a student is to access higher level marks/grades, as well as a 1.5 hour exam at the end of the course to test the student's knowledge and understanding of the theory aspect of Resistant Materials.

Following GCSE, students can go on to study an A Level in Product Design with a Resistant Materials bias or follow other Further Education routes in design and art & design.



### Formal Assessment



#### 5RM01 - Unit 1 - Creative Design & Make Activity

- This is produced as a coursework portfolio that documents a Design Activity (50% of total mark) and a Make Activity (50% of total mark) these can be treated as two separate elements or as an overall project. The coursework portfolio is **60% of the total GCSE mark**.

The exam board is Edexcel

Exemplar work can be found on the VLE in the Shared Document Drive under GCSE Resistant Materials and Graphic Products



#### 5RM02 - Unit 2 - Knowledge and Understanding of Resistant Materials

- This is a 1.5 hour exam undertaken in the summer exam season of Year 11 and tests theory understanding of materials, processes and techniques through a range of question styles, from multiple choice to long answer written questions. The exam also includes a design question that requires students to design two outcomes to match a given design specification. The exam accounts for **40% of the total GCSE mark**.

The exam board is Edexcel

Past exam papers can be found on the VLE in the Shared Document Drive under GCSE Resistant Materials and Graphic Products

## GCSE Resistant Materials

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<b>Year 9</b>					
<p><b>Bright Mild Steel Sliding Bevel</b></p> <ul style="list-style-type: none"> <li>• Introduction to GCSE RM</li> <li>• Introduction to working with metal, working with precision and use of working drawings</li> <li>• Marking out metals</li> <li>• Use of tools</li> <li>• Use of jigs</li> <li>• Use of micromill</li> <li>• Use of tap and die</li> <li>• Riveting</li> </ul> <p>Full plan of manufacturing and tool identification and practical outcome</p>	<p><b>Pencil Box</b></p> <ul style="list-style-type: none"> <li>• Introduction to woods</li> <li>• Producing working drawings</li> <li>• Understanding wood joints</li> <li>• Use of templates</li> </ul> <p>Accuracy of working drawing, step by step plan for producing finger joints and practical outcome</p>	<p><b>Post-it-note holder</b></p> <ul style="list-style-type: none"> <li>• Introduction to plastics</li> <li>• Use of jigs and formers</li> <li>• Understanding of batch production</li> <li>• Use of linebender</li> </ul> <p>Plastic types booklet and Processes for working with plastics information sheet and practical outcome</p>	<p><b>Post-it-note holder modification</b></p> <ul style="list-style-type: none"> <li>• Analysis of post it holders areas for improvement</li> <li>• Design ideas for improvements that could be made</li> <li>• Production of improved post it note holder using scrap material.</li> <li>• Analysis of improvements undertaken</li> </ul> <p>Development ideas and improved product and final analysis of improvements made</p>	<p><b>Metal Decoration Book Cover</b></p> <ul style="list-style-type: none"> <li>• Introduction to decorating metals using a range of techniques – hammer finish, grinding paste, multitool decoration, scribed marks.</li> <li>• Use of shear, brake and press</li> <li>• Use of riveting</li> <li>• Application of protective materials</li> <li>• Introduction to plastic coating</li> <li>• Introduction to vinyl sticker cutting</li> </ul> <p>Design work of metal decoration, Focus on Metals booklet and practical outcome</p>	<p><b>Batch Production CD Rack</b></p> <ul style="list-style-type: none"> <li>• Group work to make decisions on intended user, theme, relevant data collection and design ideas</li> <li>• Introduction to 3D drawing skills – planometric and isometric</li> <li>• Production of jigs, templates and formers to ensure all members of group produce identical product outcomes.</li> <li>• Understanding of vacuum forming</li> </ul> <p>Focus on RM Processes, Focus on Smart Materials, Quality of research and presented design ideas</p>
<b>Year 10</b>					
<p><b>Laser Maze Puzzle</b></p> <ul style="list-style-type: none"> <li>• Research work for intended user, relevant data, anthropometric data, questionnaire data</li> <li>• Introduction to design idea presentation drawing techniques</li> </ul> <p>Focus on RM Processes, Focus on Smart Materials, Quality of research and presented design ideas</p>	<p><b>Laser Maze Puzzle (cont...)</b></p> <ul style="list-style-type: none"> <li>• Introduction to CAD (Computer Aided Design)</li> <li>• Use of 2D Design V2 to generate maze puzzle</li> <li>• Use of CAM (Computer Aided Manufacture) – laser cutter – to produce practical outcome</li> </ul> <p>Use of CAD CAM and practical outcome</p>	<p><b>Coursework Introduction Project</b></p> <ul style="list-style-type: none"> <li>• Students working in groups to make decisions on outcomes, but all students to produce work for all aspects of the project. Introduction to requirements of GCSE Coursework:</li> <li>• Coursework research skills</li> <li>• Writing a Design Specification</li> <li>• Design Idea generation and presentation techniques</li> <li>• Modelmaking and design idea development</li> </ul> <p>Verbal feedback throughout tasks</p>	<p><b>GCSE Coursework Section 1 - Analysing the Brief</b></p> <ul style="list-style-type: none"> <li>• Choice of individual project theme</li> <li>• Analysing the Brief</li> <li>• Investigation – Identifying intended user, questionnaire data collection and analysis, relevant data collection, product analysis</li> <li>• Design Specification</li> </ul> <p>Hand in deadline and formative written feedback</p>	<p><b>GCSE Coursework Section 2 - Design Ideas with review of ideas</b></p> <ul style="list-style-type: none"> <li>• Design idea generation and presentation with some small scale practical tasks to confirm students decisions on use of joining methods, use of materials, etc</li> </ul> <p>Hand in deadline and formative written feedback</p>	<p><b>GCSE Coursework Section 2 - Design Ideas and Section 3 - Development</b></p> <ul style="list-style-type: none"> <li>• Design idea generation and presentation with some small scale practical tasks to confirm students decisions on use of joining methods, use of materials, etc</li> <li>• Design idea development</li> </ul> <p>Hand in deadline and formative written feedback</p>

## Year 11

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<p><b>GCSE Coursework Section 3 - Development</b></p> <ul style="list-style-type: none"> <li>Design idea development</li> <li>Modelmaking</li> <li>Testing practical elements of developed idea to ensure understanding of materials, joining methods, finishes, etc</li> <li>Working drawing of final design</li> <li>Materials/Cutting List for final design</li> </ul> <p><b>Hand in deadline and formative written feedback</b></p>	<p><b>GCSE Coursework Section 4 - Planning and Section 5 - Manufacture</b></p> <ul style="list-style-type: none"> <li>Initial planning of practical outcome manufacturing</li> <li>Practical outcome manufacture</li> </ul> <p><b>Ongoing verbal feedback</b></p>	<p><b>GCSE Coursework Section 5 - Manufacture and Section 6 - Testing &amp; Evaluating</b></p> <p><b>Revision for Exam</b></p> <ul style="list-style-type: none"> <li>Practical outcome manufacture</li> <li>Evaluation of practical outcome</li> <li>Final coursework hand in including all coursework sections, Sections 1-6</li> <li>Exam revision following exam board specification for Unit 2 – Knowledge and Understanding</li> </ul> <p><b>Final coursework mark submitted to exam board, with sample students portfolios submitted for moderation.</b></p> <p><b>Testing of theory understanding throughout revision process</b></p>	<p><b>Exam Revision for 1.5 hour exam</b></p> <ul style="list-style-type: none"> <li>Exam revision following exam board specification for Unit 2 – Knowledge and Understanding</li> </ul> <p><b>Testing of theory understanding throughout revision process</b></p>	<p><b>Exam Revision for 1.5 hour exam</b></p> <ul style="list-style-type: none"> <li>Exam revision following exam board specification for Unit 2 – Knowledge and Understanding</li> </ul> <p><b>External Examination of Unit 2 – Knowledge and Understanding of Resistant Materials</b></p>	

## Additional Information

From the start of the course students will be given written/design/research work that they will be expected to undertake to support their understanding of the practical work they are undertaking. This will be submitted at the end of the practical project and marked alongside the practical outcome with formative written feedback given. Students should expect to be undertaking at least 1 hour of independent learning per week for Graphic Products throughout their studies in Year 9 and the first part of Year 10. Once students have started on their GCSE Coursework Project they should expect to be completing 2 hours per week of coursework 'homework' to ensure they are able to achieve the regular deadlines and quality of work required for their GCSE project.

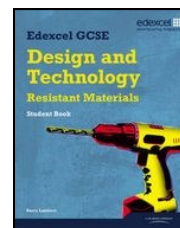
Students are NOT set within GCSE Graphic Products, the group they are allocated too will be dependent on their other option choice subjects.

Special considerations – It would be useful for students to purchase basic drawing equipment such as fineliner pen, a range of pencil weights – 2B, HB, 2H - colouring pencils, basic drawing equipment – protractors, 30/60 and 45 set square and ruler - rubber and sharpener, although there will be access to equipment within lessons. Coursework portfolios on the whole will be produced digitally in Microsoft Publisher, so if a student is able to access this, this will be of benefit when presenting work. Students will also have access to ProDesktop and 2D Design V2 for use on their home computer. If students wish to take the disks home to load this onto their home computer they need to pay a £5 deposit, which will be returned on return of the disk/s. Students will also be asked to make a contribution towards the materials used for their GCSE coursework project, as opposed to going out and buying their own materials. A letter will be sent to the students in the initial term of Year 11 to state the preferred contribution. This will allow students to access materials held by the school only, any specialist materials a student decides to use, not held by school, would be purchased by the student.

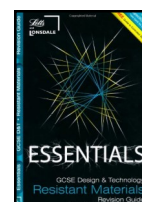
Support – If a student is struggling within lessons, or with work set as homework/independent research their first point of contact should be their class teacher who has their best interests at heart and will make attempts to clarify what is required of a given task. If the student or parent still feels there is an issue or problem they can speak to Mrs W H Hayes as Head of Department, or make contact via e mail, whayes@parkhouseschool.org

Students may wish to purchase the course text book to assist with their coursework, but specifically with their exam revision. This can be purchased from a range of suppliers and costs new, between £15 and £20. The book details are as follows:

Edexcel GCSE Design and Technology Resistant Materials Student Book [PAPERBACK] - Mr Barry Lambert  
 Publisher: Edexcel, 1 Edition (21 May 2010) ISBN-10: 1846907551 ISBN-13: 978-1846907555



Although not specific to the Edexcel specification, (but somewhat cheaper!!!) there is also the Letts Lonsdale Revision Guide for GCSE Resistant Materials, that will provide a good overview of key theory that will be useful in the exam, but may not cover all elements required. This is also available from a range of suppliers and costs between £3 and £5.



Collins GCSE Essentials - Resistant Materials: Revision Guide [PAPERBACK] - VARIOUS  
 ISBN-10: 1906415439 ISBN-13: 978-1906415433