

# GCSE Design & Technology

|               | Exam   | Topic                   | Suggested revision strategy (with links)   | Suggested outcome from revision time this week (what a parent can expect to see)   |
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| <b>Week 1</b> | WJEC<br>EDUQAS<br>GCSE<br>DESIGN &<br>TECHNOLOGY | Manufacturing technique | <ul style="list-style-type: none"> <li>• Scales of production</li> <li>• CAD/CAM</li> <li>• Built in obsolescence</li> <li>• The impact of new and emerging technologies on industry and enterprise</li> <li>• Market pull, technology push</li> <li>• consumer choice</li> <li>• The Product Life Cycle</li> <li>• Global production</li> <li>• Legislation to which products are subject. · Consumer rights and protection</li> <li>• Moral and ethical factors related to manufacturing products and the sale and use of products.</li> </ul> | Revision book from exam board.<br>Teams resources:<br>PowerPoints<br>Question worksheets & answers<br>Eduqas blended resources |
| <b>Week 2</b> |  | Sustainability          | <ul style="list-style-type: none"> <li>• The importance of sustainability issues and environmental issues when designing and making. Social, cultural, economic and environmental responsibilities in designing and making products. The SIX R's</li> <li>• Life Cycle Analysis product.</li> <li>• Fair-trade policies and carbon footprint.</li> <li>• Ecological footprint</li> </ul>   | Revision book from exam board.<br>Teams resources:<br>PowerPoints<br>Question worksheets & answers<br>Eduqas blended resources |
| <b>Week 3</b> |  | Energy generation       | <ul style="list-style-type: none"> <li>• Types of renewable and non-renewable energy sources: wind, solar, geothermal, hydroelectric, wood/biomass, wave, coal, gas, nuclear and oil.</li> <li>• Issues surrounding the use of fossil fuels: coal, oil and gas.</li> <li>• The advantages and disadvantages of</li> </ul>  | Revision book from exam board.<br>Teams resources:<br>PowerPoints<br>Question worksheets & answers<br>Eduqas blended resources |

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|                      |  |                          | <p>renewable energy sources.</p> <ul style="list-style-type: none"> <li>• The use of renewable energy sources in modern manufacturing production systems: the use of solar panels and wind turbines in manufacturing sites.</li> </ul>  |   |
| <p><b>Week 4</b></p> |  | <p>Polymers / metals</p> | <ul style="list-style-type: none"> <li>• Categorisation and working properties of ferrous metals, non-ferrous metals and alloys.</li> <li>• Properties of metals: hardness, elasticity, conductivity, toughness, ductility, tensile strength and malleability.</li> <li>• Ferrous metals: cast iron, mild steel, medium carbon steel and high carbon steel.</li> <li>• Ferrous metals may require a protective finish and the finish is sometimes used to improve the aesthetic appeal.</li> <li>• Non-ferrous metals: aluminium, copper, brass, bronze.</li> <li>• Alloys of metals are a base metal mixed with other metals or non-metals to change their properties or appearance.</li> <li>• Non-ferrous metals may require a protective finish and the finish is sometimes used to improve the aesthetic appeal. Categorisation and physical properties of polymers.</li> <li>• The differences between a thermoforming (thermoplastic) and thermosetting material.</li> <li>• Properties of polymers: weight, hardness, elasticity, conductivity/insulation, toughness and strength.</li> <li>• The properties of thermoplastics: polythene, polystyrene, polypropylene and PVC.</li> <li>• The properties of the thermosetting plastics: UF (urea formaldehyde), MF</li> </ul> | <p>Revision book from exam board.<br/> Teams resources:<br/> PowerPoints<br/> Question worksheets &amp; answers<br/> Eduqas blended resources</p> |

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|               |  |                  | (melamine formaldehyde), PR (polyester resin) and ER (epoxy resin)   |   |
| <b>Week 5</b> |  | Papers/ textiles | <ul style="list-style-type: none"> <li>• The categorisation and properties of paper, cards and boards:</li> <li>• Papers, cards and boards can be laminated to improve strength, finish and appearance. • The standard ISO sizes of paper.</li> <li>• The use of grammage i.e. grams per square metre (gsm) to measure weight of paper.</li> <li>• The use of microns to measure thickness of card. The use of recycled materials to manufacture papers and boards.</li> <li>• The aesthetic and functional properties of common papers, cards and boards: layout paper, tracing paper, copier paper, recycled paper, corrugated board, cartridge paper, mounting board and folding boxboard. The categorisation and working properties of fibres and textiles.</li> <li>• The raw materials of textiles are classified according to their source.</li> <li>• Natural polymers:</li> <li>• Animal polymers: wool/silk</li> <li>• Plant polymers: cotton, linen hemp, jute.</li> <li>• Manufactured polymers:</li> <li>• Synthetic: polyester, polypropylene, nylon, acrylic, elastane, lycra, aramid fibres.</li> <li>• Microfibres – Tactel, Tencel (Lyocell).</li> <li>• The properties of textiles fibres: strength, elasticity, absorbency, durability, insulation, flammability, water-repellence, anti-static and resistance to acid, bleach and sunlight.</li> <li>• Blending and mixing fibres improves the</li> </ul> | <p>Revision book from exam board.<br/> Teams resources:<br/> PowerPoints<br/> Question worksheets &amp; answers<br/> Eduqas blended resources</p> |

|               |  |                               | properties and uses of yarns and materials  |   |
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| <b>Week 6</b> |  | Timbers                       | <p>The categorisation and properties of hardwoods and softwoods.</p> <ul style="list-style-type: none"> <li>• Properties to be considered: strength, grain structure, surface finish and absorbency.</li> <li>• Natural timber is harvested from deciduous (hardwoods) and coniferous (softwood) trees.</li> <li>• Natural timber is available in the following forms: plank, board, strip, square, and dowel.</li> <li>• Natural timber can be identified using a range of discriminators: weight, colour, grain, texture, durability and ease of working.</li> <li>• Natural timber is protected using different finishes and these finishes are sometimes used to improve aesthetic appeal.</li> <li>• Categorisation and properties of manufactured timbers.</li> <li>• Manufactured timbers are made from natural timbers and made from particles/fibres or laminates.</li> <li>• Manufactured timbers are available in standard sizes and forms: plywood, MDF (Medium Density Fibreboard), chipboard, hardboard and veneered boards.</li> <li>• Manufactured timbers can be protected using finishes and these finishes are sometimes used to improve the aesthetic appeal</li> </ul> | <p>Revision book from exam board.<br/>Teams resources:<br/>PowerPoints<br/>Question worksheets &amp; answers<br/>Eduqas blended resources</p> |
| <b>Week 7</b> |  | Mechanical/electrical systems | <p>Circuit diagrams, block diagrams and flowcharts.</p> <ul style="list-style-type: none"> <li>• The 'systems' approach – input; process; output.</li> <li>• Principles of a control system:</li> <li>• The importance of feedback within the system.</li> <li>• The methods of providing feedback in different systems.</li> <li>• Analogue and digital sensors as input components.</li> <li>• Sub routines or macros in control systems.</li> </ul>  | <p>Revision book from exam board.<br/>Teams resources:<br/>PowerPoints<br/>Question worksheets &amp; answers<br/>Eduqas blended resources</p> |

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|               |  |                                       | <ul style="list-style-type: none"> <li>• Programmable microcontrollers</li> <li>• Programmable Interface Controllers</li> <li>• Consider mechanical systems in terms of input; process; output.</li> <li>• Mechanical systems which: increase or decrease speed of movement/rotation; change magnitude/direction of force/movement/rotation.</li> <li>• Simple calculations involving mechanical systems.</li> <li>• Analyse the function of mechanical products that have: <ul style="list-style-type: none"> <li>• pulley systems</li> <li>• gear systems</li> <li>• levers and linkages</li> <li>• rack and pinion</li> <li>• cams</li> </ul> </li> </ul> |  |
| <b>Week 8</b> |  | Smart materials/<br>technical textile | Electroluminescent film or wire i.e. LCD. • Quantum Tunnelling Composite (QTC) • SMA – shape memory alloys. <ul style="list-style-type: none"> <li>• Polymorph.</li> <li>• photo-chromic;</li> <li>• thermo-chromic;</li> <li>• micro-encapsulation;</li> <li>• biometrics.</li> <li>• Carbon Fibre, Kevlar and GRP.</li> <li>• Interactive textiles</li> <li>• Micro-fibres in clothing manufacture.</li> <li>• Phase changing materials</li> <li>• Sun protective clothing.</li> <li>• Nomex.</li> <li>• Geotextiles for landscaping.</li> <li>• Rhovyl</li> </ul>   | Revision book from exam board.<br>Teams resources:<br>PowerPoints<br>Question worksheets & answers<br>Eduqas blended resources |