

## Hartford Church of England High School – Year 10 – Engineering Design

| Year 10           | HT1  | HT2  | HT3   | HT4  | HT5  | HT6   |
|-------------------|--|--|---|--|--|---|
| <b>Topic(s)</b>   | Skills Builder in Engineering – What is Engineering  | Skills Builder in Engineering – Communicating within 2D and 3D   | Skills Builder in Engineering- Manufacturing a prototype  | R039 Communicating Design Ideas – Sketching, initial design ideas and development of design ideas.                       | R039 Communicating Design Ideas – Technical drawings and Computer Aided Design   | R038 – Bespoke theory linked to the examination unit.   |
| <b>Focus</b>      | A study into what engineering is, the differing sectors, and key skills required to be a successful engineer.  | Development of key skills linked to communicating design ideas in 2D, 3D and using CAD Computer Aided Design,                        | Working to an engineering brief students manufacture a product that fully satisfies a product design specification.   | Working on controlled assessment students generate a range of sketches, design ideas drawings and development.           | Working on controlled assessment students generate technical drawings (isometric, oblique, assembly) and computer aided design drawings.   | Students completing a range of topics and focus practical tasks linked to the R038 examination unit.  |
| <b>Vocabulary</b> | Engineering Sectors: Chemical, Structural, Mechanical, Communication Skill, Graphical Skill, Organizational Skill  | Research, Isometric Drawing, Orthographic Drawing, Sectional Views, Freehand Sketching, CAD (2D & 3D Modelling)                      | Manufacturing, Technique, One Off Production, Batch Production, Mass Production, Quality Assurance, Risk Assessment, Health & Safety, Procedure             | Research, Engineering brief, Specification, Isometric Drawing, Orthographic Drawing, Sectional Views, Freehand Sketching | Engineering brief, Specification, CAD (2D & 3D Modelling)  | The Design Process, Sustainability, ACCESS FM, The 6R's, Manufacturing Techniques, Technical Drawing Techniques   |
| <b>Assessment</b> | Exam – End of Unit Knowledge Paper – focused on all prior learning at the end of the unit. A range of short knowledge recall questions and opportunity for extended writing in more complicated questions. | Assessed 'key pieces' of work including: isometric drawing, orthographic drawing, sectional views, freehand sketches and use of CAD. | Assessed Practical based on the quality of outcome made within lessons when modelling – focus on working to tolerance, quality of finish & health & safety. | R039 Communicating Design Ideas – Assessment Criteria<br>-Manual production of freehand sketches<br>-Design Development  | R039 Communicating Design Ideas – Assessment Criteria<br>-Manual production of engineering drawings<br>-Use of Computer Aided Design (CAD)<br>COURSEWORK SUBMISSION prior to Easter Holiday. | Exam – End of Unit Past Paper – focused on all prior learning at the end of the unit. A range of short knowledge recall questions and opportunity for extended writing in more complicated questions. |

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|                          |   |  |  |  | Teacher Assessment verified by external moderation (OCR)   |   |
| <b>Curriculum Thread</b> | Research into Engineering   | Communication Skills   | Manufacture & review   | Communicating Design Ideas   | Communicating Design Ideas   | Preparation for written exam  |
| <b>Wider Reading</b>     | STEM Careers: A student's guide to opportunities in science, technology, engineering and maths Paperback – 1 Sept. 2017 | Design Thinking Notebook: A step-by-step process to help innovators create solutions to everyday problems. Easy to use planning templates for ... creative kids in STEAM learning classrooms. Paperback – 11 Feb. 2024 | Engineers Making a Difference: Inventors, Technicians, Scientists and Tech Entrepreneurs Changing the World, and How You Can Join Them: Inventors, ... Changing the World, and How You Can Join Them | Level 1/Level 2 Cambridge National in Engineering Design (J822): Second Edition by Alex Reynolds | Level 1/Level 2 Cambridge National in Engineering Design (J822): Second Edition by Alex Reynolds | Cambridge National in Engineering Design Revision Guide and Workbook with Digital Access (2 Years): Level 1/Level 2 (Cambridge Nationals) Paperback – 18 Aug. 2022 by Claire Reet |