



Curriculum Intent

Subject: Engineering

Year 9

	What?	Why?	National Curriculum Links
Term 1-1	<ul style="list-style-type: none"> Producing freehand sketches of design ideas – 2D and 3D Annotating and labelling a range of techniques CAD/CAM understanding Building knowledge of a range of assembly drawings 	<ul style="list-style-type: none"> Be able to select tools & equipment correctly Analysis of existing products for quality and understanding Knowledge of material properties with an understanding of suitability Developing quality sketching Quality measuring and drawing to produce quality practical work Mathematical modelling (2d design and sketchup) with industrial application 	<ul style="list-style-type: none"> N/A



YEAR 9 – R039 Communicating Design

Building the core design communication skills students will need for future units.

Autumn Term

- Introduction to Engineering Design
- Sketching skills:
 - 2d thumbnail and 3d freehand sketches
 - Isometric
 - Thick and thin lines on 3d sketches
 - Orthographic
 - Rendering & shading to show form
 - Using annotations effectively
 - Design communication theory: why engineers communicate ideas
 - Exploded diagrams

Spring Term

- 2D CAD introduction
- 3D CAD basics: simple components
- Creating engineering drawings from CAD
- Using symbols, dimensions, scale
- Modelling ideas with simple card or foam prototypes
- Communicating design intent to a client
- Finishing off a design portfolio for a simple product
- Assessment for R039 completed

Summer Term

- Prepare students for the design development they'll do in Year 10
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YEAR 10 – R040 Design, Evaluation & Modelling

Applying design skills to develop, test, and refine solutions.

Autumn Term

- Understanding client requirements
- Analysing existing products
- Developing design criteria
- Sketch → Refine → Develop workflows
- Iterative design cycles

Spring Term

- Modelling techniques:
 - Computer modelling - CAD
 - Physical modelling (wood, foam, 3D printing if available)
- Evaluating prototypes
- Measuring performance against design criteria
- Making improvements based on testing
- Final design solution
- Presenting design justification
- Completion of R040

Summer Term

- Start early revision of R038 for Year 11
 - Introduce exam-style questions and terminology
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YEAR 11 – R038 Principles of Engineering Design + January Exam

Bringing everything together, then preparing for the exam early in the year.

Autumn Term (September–December)

Unit R038 content:

- Design briefs and specifications
- Iterative vs. linear design processes
- Materials, manufacturing processes, and why engineers choose them
- Evaluating designs and products
- Sustainability and engineering considerations
- Exam practice every 2–3 weeks
- Mock exam in November/December

January

- **Official R038 Exam (external assessment)**
 - Last-minute revision
 - Exam command words training (Explain, Evaluate, Describe, Justify)
 - Past papers and mark schemes focus
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