

# Engineering Design Key Stage 4 Curriculum Learning Journey



## Engineering Design essential knowledge:

- The design cycle.
- Factors that affect design
- Different methods of design
- Properties of materials.
- Sustainability and environmental impact.
- Knowledge of manufacturing processes.
- An understanding of how things are made
- Methods of manufacture.
- An understanding of how things work.

## Engineering Design essential skills:

- Designing skills – 2D and 3D, freehand and CAD.
- Annotation of ideas, designs or products.
- Working with materials – processes, manufacturing, measuring, etc.
- Practical skills – manufacturing hand and CAM.
- Solving problems.
- Understanding and answering technical questions.
- Present information accurately, using a wide range of technical language
- To be able to critically analyse products
- To be able to form critical judgements and draw conclusions.



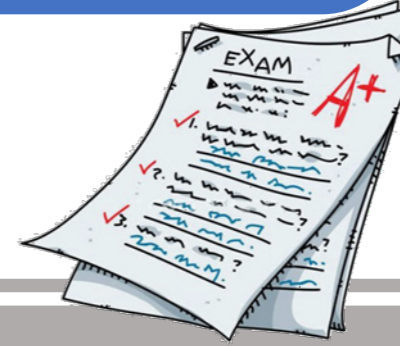
**R038:** Design requirements; user needs and manufacturing considerations

**R038:** Revision of topic areas

**R040:** Physical modelling activity



**R038** Revision of topic areas/exam revision  
**R038** Examination (final opportunity)  
**R040:** Physical modelling activity (continues)  
**R040:** NEA Assessment (submit for moderation)



**Key Stage 5**  
 Choose to continue studying  
 A Level/BTEC Engineering  
 A Level/ CNAT Engineering Design  
 A Level Product Design  
 Engineering apprenticeship



**R039:** NEA Assessment (resubmit for moderation)1  
**R040:** NEA Assessment (submit for moderation) 1  
**R038:** Examination (early opportunity)

**R038** Design considerations; user needs and manufacturing requirements  
**R040:** Virtual CAD/Physical modelling activity



**R038:** Evaluating design ideas and outcomes

**R040:** Virtual CAD modelling activity

**R040:** NEA Assessment (working on)

**R038:** Design requirements; user needs and manufacturing considerations

**R040: Design, evaluation and modelling**  
 For this unit students will learn how to create and test models of their designs.

- product evaluation
- modelling design ideas.

**R040 Design, evaluation and modelling**

R040: Product analysis and disassembly activity

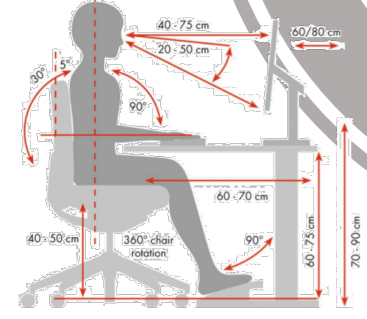
**R038 Principles of engineering design**



**R038:** Make, model and evaluate; virtual and physical prototypes  
**R039:** NEA Assessment (submit for moderation)

**R038:** Influences on engineering product design  
**R039:** NEA Assessment (working on)

**R038 Principles of engineering design**



**R039: Communicating designs**  
 In this unit students will learn how to use sketching and engineering drawings to communicate design ideas.

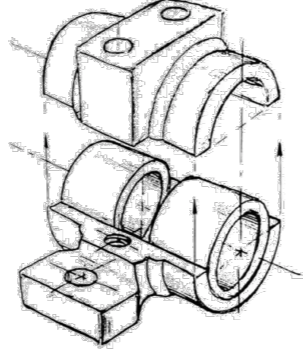
- manual production of freehand sketches
- manual production of engineering drawings
- use of computer aided design (CAD).

**R038:** Sketching and drawing, CAD  
**R039:** Drawing design ideas activity  
**R039:** NEA Assessment (working on)  
 Producing CAD models activity



**R039 Communicating designs**

R038: Sketching and drawing, CAD



R038: Designing processes; stages and strategies, cyclic approach

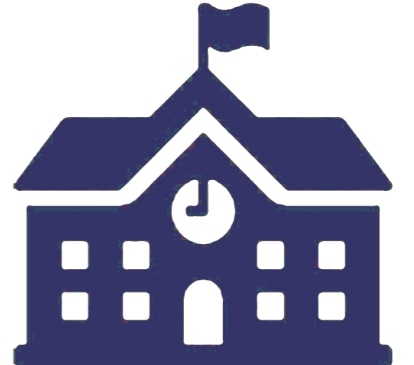
**R038 Principles of engineering design**



**R038:** In this unit students will learn about the design process and all the stages that are involved.

- designing processes
- designing requirements
- communicating design outcomes
- evaluating design ideas

**OCR-set assignment**  
 Approx. 10-12 hours



**Key Stage 3**

**Key Stage 3**