

# Knowledge Organiser

Learners will explore the links between the various engineering sectors and the role of design in the production of engineered products

## Learning Aim A

Learners will present a detailed evaluation of why an engineered product is made collaboratively by a number of different organisations of different sizes. Learners will show a detailed understanding of specialist engineering organisations in given sectors and the reasons why they are needed when producing a complex product. Learners will present detailed reasons why engineers from different sectors, such as mechanical and electrical/electronic, cooperate to produce an engineered product that contains numerous components that link together. Learners will present detailed explanations of why certain job roles are required when producing an engineered product so that activities can be carried out at the correct time and in the correct manner, and the skills of those involved are best utilised.

## Learning Aim B

Learners will produce sketches of a minimum of two design proposals. They will be detailed and include sufficient information so that a third party can make an informed decision about which proposal to develop into a detailed final design, meeting the requirements of the engineering brief. Learners will produce sketches that are fully dimensioned and set out to an appropriate standard. They will prepare design proposals that are significantly different.

Learners will display detailed annotation of sketches that show how each design fully meets the requirements of the engineering brief. They will select and justify the design proposal and present further ideas for its development. Learners will produce a final 2D CAD design using a full range of commands to a suitable standard. They will model a physical 3D solution that is accurate, using materials and techniques that are the most appropriate for the chosen design. Learners will present detailed, accurate reasons for their decisions when specifying materials, making processes and quality requirements. Learners will evaluate the successful features of the design process, such as interpreting the brief, preparing design proposals, utilising all types of feedback and using a range of modification tools, again with reference to the engineering brief. Learners will provide detailed feedback to other learners about their chosen design solution and justify how it relates to all elements of the engineering brief. Feedback will take the form of written commentary, graphics and verbal communication.

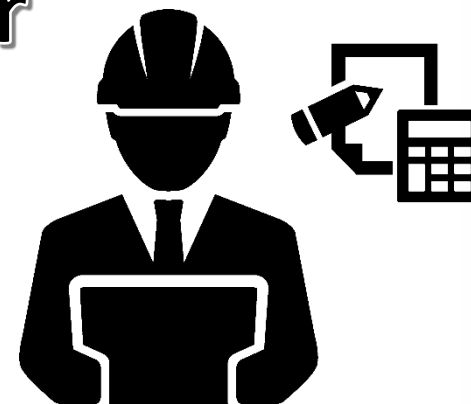
## Unit Overview

A range of people with different skill sets work together during the production of electrical, electronic and mechanical engineered products, such as mobile phones and mountain bikes. In this component, you will develop knowledge and understanding of the engineering industry, the interconnections within engineering sectors, and how these are integrated to enable organisations to find solutions to real-life problems. You will explore the role that design applications play in the production of engineered products. Through practical exercises, you will produce solutions to problems using different combinations of design and modelling engineering skills. This component will support you in progressing to a Level 2 or 3 qualification in a range of engineering sectors, for example aerospace, automotive, electrical, electronic, manufacturing, marine, mechanical or telecommunications. You will develop transferable skills such as problem solving, communication and aspects of critical thinking, all of which will support your progression to Level 2 or 3 vocational or academic qualifications.

## Learning Aims:

**A** Understand engineering sectors, products and organisations, and how they interrelate

**B** Explore engineering skills through the design process.



## Recourses

For this component, learners must have access to:

- the internet to carry out research about engineering organisations
- case studies for a number of well-known companies – national and local to centre
- 2D and 3D CAD packages, e.g. AutoCAD®, SolidWorks®, Pro/DESKTOP, Multisim™, DraftSight®
- modelling materials such as card, moulding compound
- an interactive presentation facility.

## Key Vocabulary

CAD, CAM, Datum, tolerances, Lead times

## Numeracy links:

Working with timings and costs to understand business practice

## Work Related Learning:

Directly learning how an engineering company functions gives students a head start on life in industry.

## SMSC and British Values

Understanding the importance that good design can have to solve critical issues in the world.