

# Year 10 Engineering—Key Components Autumn 1

Key Vocabulary – Understanding Engineering Disciplines (LO1)	
Vocab	Definition
Mechanical	Hydraulics (Pascal's principle), gears and pulleys
Electrical and Electronic	Power station, household appliances, integrated circuits
Aerospace	Aircraft, space vehicles, missiles
Communications	Telephone, radio and fibre optic
Chemical	Pharmaceuticals, fossil fuels, food and drinks
Civil	Bridges, roads and railways
Automotive	Cars, motorcycles and trains
Biomedical	Prosthetics, medical devices and radiotherapy
Software	Applications, systems and computer programming.
HASAWA	Health and Safety at Work Act etc
PPE	Personal Protective Equipment at Work regulations
MHOR	Manual Handling Operations Regulations
COSHH	Control of Substances Hazardous to Health
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

## Learning outcome 1: Understand engineering disciplines

In this learning outcome, the learner will know and understand how different engineering disciplines are applied to projects and products. The learner will know and understand the health and safety legislation that influences engineering.

### 1.1 Engineering Disciplines through Projects and Products

In this learning outcome, the learner will understand different engineering disciplines and how their application has solved problems and shaped the modern world through projects and products.

### 1.2 The Health and Safety Legislation Governing Engineering

The learner will understand how the engineering industry complies with government legislation.

Key Vocabulary – Reading Engineering Drawings (LO3)	
Vocab	Definition
Line	Visible, hidden, centre, construction, dimension
Tolerance	+ or – dimensioning, limits of size
Content of title block	Author, drawing number, date, title, materials, scale, sheet number, system of measurement, projection
Scale	Ratio
System of measurement	Imperial and metric, conversion
Two-dimensional projection	First angle projection and symbol, third angle projection and symbol
Three-dimensional projection	Axonometric, isometric, two-point perspective.
British Standard BS 8888	purpose of the standard, how it fits with the ISO standards, how the standard is applied to engineering drawings.

## Learning outcome 3: Reading engineering drawings

In this learning outcome the learner will be able to read and interpret engineering drawings accurately. The learner will be able to understand specific drawing conventions used throughout the engineering industry, and the purpose of using British Standards.

### 3.1 Reading Engineering Drawings

#### 3.1.1 Drawing conventions

#### 3.1.2 British Standards



You will use a variety of tools to shape plywood, concrete, steel, acrylic and electronics to make a desk lamp.

You will develop your practical skills along side your knowledge of engineering.

You will need to accurately read engineering drawings to manufacture your lamp.

# Year 10 Engineering—Key Components Autumn 2

## Key Vocabulary - Understand the properties and characteristics of engineering materials and why specific materials are selected for engineering applications LO4

Vocab	Definition
Chemical	Heat of combustion, toxicity, oxidation state
Electrical and Magnetic	Conductivity, resistance, magnetism
Mechanical	Strength, hardness, toughness, elasticity, plasticity, ductility, durability, malleability
Optical	Reflectivity, photosensitivity
Thermal	Flammability, thermal conductivity, melting point
Aesthetic	Colour, surface texture, finish effect
Environmental impact	Extraction of raw material, fossil fuels, sustainability
Metals	Ferrous alloys— mild steel, cast iron, stainless steel: pure non-ferrous – aluminium, copper, lead: non-ferrous alloys – brass, pewter, solder
Polymers	Thermoset – epoxy resin, urea formaldehyde, polyester resin: thermoplastic – acrylic, polypropylene, high-impact polystyrene: elastomers – rubber, neoprene, silicone
Wood	Hardwood – oak, ash and balsa: softwood – Scots pine, cedar, spruce: manufactured board – plywood, MDF, chipboard
Ceramics	Glass, cement, brick, diamond, pottery
Composite	Concrete, glass reinforced plastic (GRP), carbon fibre reinforced polymer (CFRP).

### Learning outcome 4: Understand the properties and characteristics of engineering materials and why specific materials are selected for engineering applications

In this learning outcome, learners will know and understand the properties and characteristics of materials and why they are selected for engineering products and projects.

#### 4.1 Properties and Characteristics of Materials

Learners will understand how materials exhibit properties and characteristics in engineering products and projects.

## Key Vocabulary - Understand engineering tools, equipment, and machines LO5

Vocab	Definition
Marking out	Scriber, Steel rule, Engineer's square, Marking gauge, Centre/dot punch, Calipers
Modification	Hacksaw, Junior hacksaw, Tenon, Coping, Jigsaw, Scroll saw, Tin snips, Computer-Aided Manufacture laser cutter, Pliers, Ball-peen hammer, Claw hammer, Cordless drill, Angle grinder, Router, Lathe, Pillar drill, Computer Numerical Control milling machine, Computer Numerical Control lathe, File.
Joining	Riveting gun, Screwdriver (Phillips, Torx, slotted, Pozidriv), Spanner, Hot glue gun, Soldering iron, Nail gun, Components (nails, screws, rivets, nuts and bolts).
Finishing	Hand sander, Disc sander, Buffing wheel.
Control Measures	Training requirements, Risk assessment, Guards and safety zones, Isolation and emergency power cut off, Personal protective equipment (PPE) (eyes and ears, head and face, respirator, gloves, clothing, footwear), Extraction and ventilation for each piece of equipment.

### Learning outcome 5: Understand engineering tools, equipment and machines 5.1 Tools, Equipment and Machines

Learners will know and understand the health and safety, control measures, safe and correct use of common tools, equipment and machines used in the engineering industry for manufacturing including those used for marking-out, cutting, modifying, joining and finishing

#### 5.2 Safe and Correct Use

The learner will understand the safe and correct use of common tools, equipment and machines used in the engineering industry.



You will use a variety of tools to shape plywood, concrete, steel, acrylic and electronics to make a desk lamp. You will develop your practical skills along side your knowledge of engineering. You will need to accurately read engineering drawings to manufacture your lamp.