



YEAR 12 2023-2024 TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Metals and Processes



Curriculum Intent

In addition to working further on objectives from Year 9 , pupils will be taught, following National Curriculum guidelines, the following this term:

To know different **stock forms** of metals i.e. **sheet, plate, tube, structural**.

To understand the difference between the categories of metals

To know in full four different types of **ferrous, non-ferrous and alloys**

To know the **performance characteristics** of different types of metals and the uses e.g. **hardness, toughness, elasticity**, ect...

To know and understand the methods of treating metals by **case hardening and tempering**.

To know the different processes to join metals

To understand how metals can be shaped into 3D products

To be able to describe

- **press forming, spinning, cupping, forging, drop forging, bending, rolling, casting: sand casting, die casting, investment casting. low temperature casting (pewter).** ^{[1][1]}_[SEP]

To know the suitability of the different joining methods for a range of specific products and scales of production.

- **Specific processes to include:**
- **addition/fabrication processes:**
- **MIG/TIG welding**
- **Spot welding**
- **Oxy-acetylene**
- **soldering** ^{[1][1]}_[SEP]
- **brazing** ^{[1][1]}_[SEP]
- **riveting** ^{[1][1]}_[SEP]
- **temporary joining methods and fasteners:**
- **self tapping screws**
- **machine screws** ^{[1][1]}_[SEP]
- **nuts and bolts.** ^{[1][1]}_[SEP]

To be able to explain the suitability of the different **wasting processes** for a range of specific components and products.

- **Specific processes to include:**
- **milling** ^{[1][1]}_[SEP]
- **turning**
- **punching/stamping**
- **flame/plasma/laser cutting.**

To be aware of the ways that metals can be finished to enhance their **appearance** or prevent **corrosion**.

- **Specific finishes to include:**
- **cellulose paint** ^{[1][1]}_[SEP]
- **acrylic paint** ^{[1][1]}_[SEP]
- **electro-plating** ^{[1][1]}_[SEP]
- **dip coating** ^{[1][1]}_[SEP]
- **powder coating** ^{[1][1]}_[SEP]

Skills/Assessment Objective Links

	<ul style="list-style-type: none"> galvanising sealants preservatives anodising plating coating cathodic protection
Spiritual, moral, social, and cultural development	SMSC: PSHE/British Values: Links to British industries and products Skills Builder: Linking product with the type of material and the reasons why the material is used.
Numeracy	
Literacy	Vocabulary Tier 2: See highlighted above Vocabulary Tier 3: See highlighted above Reading: exam style question, text book terminology Writing: use of technical tier 3 vocabulary within an exam question and annotation Oracy: when questioned pupils are able to use technical subject specific language
Becoming future ready	Careers/Employability: Knowledge of metals, metal industries and processes
Adaptation	Throughout this topic, quality first teaching will provide differentiation:
QFT/SEND Provision	By product: By resource: A Level books, Online resources, Powerpoints By Intervention: by providing different levels of supervision and support By Progressive Questioning: exploring pupils' understanding through interactive dialogue. By Grouping: according to prior attainment, gender, social preference, preferred learning style. By Task: Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range. By Offering Optional Activities: In class or as homework, to extend learning. This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.
Implementation Curriculum Delivery	<ul style="list-style-type: none"> See Above
Learning Outcomes (Knowledge)	Red denotes interleaving; aspects of knowledge covered previously. Only a small amount of knowledge covered at GCSE
Current learning to be developed in the future within:	
Assessment	End of Unit assessment – use of AQA Exampro questions
Impact	Students to have knowledge and understanding of metals, processes and finishes in order to be able to answer exam style questions and apply knowledge and understanding to NEA tasks.