



# YEAR 12 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).**

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**
- **brazing**
- **riveting**
- **temporary joining methods and fasteners:**
- **self tapping screws**
- **machine screws**
- **nuts and bolts.**

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**
- **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**
- **acrylic paint**
- **electro-plating**
- **dip coating**
- **powder coating**

### Skills/Assessment Objective Links

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