

## Cycle 3 & 4 : Emerging technologies and systems & Metals

<b>My Expected Grade</b>				
<b>Teacher Assessed Grade (circle)</b>				
SBE	BE	E	AE	SAE
<b>Comment:</b>				

Grade		Prior	Know
8 - 9	<p>I..</p> <p>Understand and can explain why materials and components are available in standard forms and sizes</p> <p>Know of school- and commercial-based cutting, forming and processing techniques, tools and equipment</p> <p>Know the primary sources of materials for producing metals and alloys and can provide examples</p> <p>Recognise and characterise different types of metals and alloys and know of their properties</p> <p>Understand how the physical and working properties of a range of metals and alloys affect their performance</p> <p>Understand contemporary and potential future use of automation, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM)</p>		
6 –7	<p>I ..</p> <p>Know why materials and components are available in standard forms and sizes</p> <p>Understand some of the commercial-based cutting, forming processes, techniques, tools and equipment</p> <p>Know some of the primary sources of metals and alloys</p> <p>Understand some of the working properties of some metals and alloys affects their performance</p> <p>I have knowledge of contemporary and potential future use of automation</p> <p>Am able to use hot metal working equipment with skill</p>		
4 –5	<p>I can...</p> <p>List some standard stock forms</p> <p>Understand there are different processes for cutting and forming</p> <p>Explain what a primary source of a material is</p> <p>List some properties of metals</p> <p>Explain what automation is</p> <p>Am able to use hot metal working equipment safely</p>		

# Emerging Technologies 3.1.1

## Project Brief

You are to learn about new and emerging technologies, processes and systems. You are also going to learn more about metals and make a pewter cast keyring using CAD CAM.

## Project Context

Technology is always advancing, products are being made through quicker, safer and more efficient means. Computers and manufacturing machines are now an integral combination in a factory but they provide us with their advantages and disadvantages.



Why learn about emerging technologies?

- To keep up to date with the latest and most efficient manufacturing techniques
- To develop your own personal CAD & CAM skills in preparation for what is required at GCSE level and beyond

Week	Content	Completed?	
		Y / N	EFFORT
Cycle 3 1&2	<p>Lesson 1</p> <ul style="list-style-type: none"> <li>• New &amp; Emerging Technologies</li> </ul> <p><i>Homework 1: Complete the Question sheet on the topic of Industry &amp; Enterprise</i>  <i>Challenge: Research examples of automation - a particular company or product manufacture</i>  <i>Further Challenge: Create a table and record all the advantages and disadvantages that you can think of when using automation instead of jobs being done by hand</i></p> <p>Lesson 2</p> <ul style="list-style-type: none"> <li>• Production Techniques and Systems</li> </ul> <p>Lesson 3</p> <ul style="list-style-type: none"> <li>• Homework 1 review</li> <li>• Introduction to pewter casting project</li> <li>• Metal sub groups research task</li> <li>• Inspiration board—Design Movements</li> </ul> <p><i>Homework 2: Complete the table of information: Ferrous &amp; Non Ferrous metals.</i>  <i>Challenge: Add further research to the homework task, this could include images of different metal types and images of metal products.</i>  <i>Further Challenge: Identify and explain why the product may be made from each metal type - what properties are required</i></p> <p>Lesson 4</p> <ul style="list-style-type: none"> <li>• Product Analysis</li> <li>• Design development</li> <li>• Card modelling</li> <li>• Pewter casting process</li> </ul> <p>Lesson 5</p> <ul style="list-style-type: none"> <li>• Homework 2 review</li> <li>• Metal stock forms</li> <li>• 2D Design—CAD drawing of mould</li> </ul>		

Week	Content	Completed? Y / N      EFFORT
3&4	<p>Lesson 6</p> <ul style="list-style-type: none"> <li>2D Design—CAD drawing of mould—completed</li> <li>Start of ROTATION activities: theory; laser cutting &amp; pewter casting</li> </ul> <p><u>Homework 3:</u> Complete the worksheet for People Culture &amp; Society  <u>Challenge:</u> Research and find a product example that has been developed due to Market Pull or Market Push (Present your research to a high standard.)  <u>Further Challenge:</u> What future products do you think will need to be developed? Have you spotted a gap in the market?</p> <p>Lesson 7</p> <ul style="list-style-type: none"> <li>ROTATION activities: theory; laser cutting &amp; pewter casting</li> </ul> <p>Lesson 8</p> <ul style="list-style-type: none"> <li>Homework 3 review</li> <li>ROTATION activities: theory; laser cutting &amp; pewter casting</li> </ul> <p>Lesson 9</p> <ul style="list-style-type: none"> <li>ROTATION activities: theory; laser cutting &amp; pewter casting</li> </ul> <p><u>Homework 4:</u> Complete the worksheet Informing Design Decisions  <u>Challenge:</u> How many products can you identify that have 'built in or planned obsolescence'? Present your list using images if possible  <u>Further Challenge:</u> Can you analyse a product that has been 'designed for maintenance'?</p> <p>Lesson 10</p> <ul style="list-style-type: none"> <li>Homework 4 review</li> <li>End of Unit test for New &amp; Emerging Technologies</li> </ul>	
5&6	Work Experience	
Cycle 4 1&2	<p>Lesson 11</p> <ul style="list-style-type: none"> <li>Sources and origins of metals—PGOnline</li> </ul> <p><u>Homework 5:</u> Complete the worksheet Origins of Metals  <u>Challenge:</u> How are metals recycled or re-used? What is the process? Can you research and incuse images/diagrams?  <u>Further Challenge:</u> Can you find an example product and explain it's LIFE CYCLE?</p> <p>Lesson 12</p> <ul style="list-style-type: none"> <li>Practical—metal finishing skills: drilling and shaping</li> </ul> <p>Lesson 13</p> <ul style="list-style-type: none"> <li>Homework 5 review</li> <li>Working with metal based materials and fixings—PGOnline</li> </ul> <p><u>Homework 6:</u> Complete the worksheet Metal Based Materials  <u>Challenge:</u> Research the following metal casting processes: sand casting; dye casting.  <u>Further Challenge:</u> Include example products made using the different types of metal casting - do you know WHY they have been used for that specific product?]</p> <p>Lesson 14</p> <ul style="list-style-type: none"> <li>Practical—metal finishing skills: drilling and shaping—complete practical</li> <li>Hand in of pewter cast project</li> </ul> <p>Lesson 15</p> <ul style="list-style-type: none"> <li>Homework 6 review</li> <li>Commercial Manufacturing methods and surface finishing treatments—PGOnline</li> </ul>	

Week	Content	Completed?	
		Y/N	EFFORT
3&4	<p>Lesson 16</p> <ul style="list-style-type: none"> <li>• Mini test—pewter project –metals &amp; CAD</li> <li>• Material properties</li> </ul> <p><u>Homework 7:</u> Complete the test paper for the end of Unit 5C - Metals  <u>Challenge:</u> Use examination question preparation techniques - identify the <b>COMMAND</b> word, underline keywords/points; assess how many marks - make notes and structure your answers for longer worded responses  <u>Further Challenge:</u> Make flash cards as revision for this topic.</p> <p>Lesson 17</p> <ul style="list-style-type: none"> <li>• Metals and alloys—PGOnline</li> </ul> <p>Lesson 18</p> <ul style="list-style-type: none"> <li>• Homework 7 review</li> <li>• Mock exam &amp; revision techniques</li> </ul> <p><u>Homework 8:</u> Complete evaluation for pewter keyring project.  <u>Challenge:</u> Create a 'PRODUCTION PLAN' for the making of the keyring - this is a step by step guide of making  <u>Further Challenge:</u> Put your steps into a FLOW CHART, search the web for guidance if you are unsure</p> <p>Lesson 19</p> <ul style="list-style-type: none"> <li>• Health &amp; Safety considerations</li> <li>• Soldering process—examination style question</li> </ul> <p>Lesson 20</p> <ul style="list-style-type: none"> <li>• Homework 8 review</li> <li>• Wasting &amp; Addition Processes</li> </ul> <p><u>Homework 9:</u> Complete the research on waste and addition processes  <u>Challenge:</u> Add images to aid your understanding - remember this will be YOUR revision  <u>Further Challenge:</u> Add example products where possible</p>		



## LEARNING TOOLS

Tick when you think you are able to define the meaning of the keyword

KEYWORDS	FMS	CAD	CAM	JIT
Mass	Batch	Standardisation	CNC	PPE

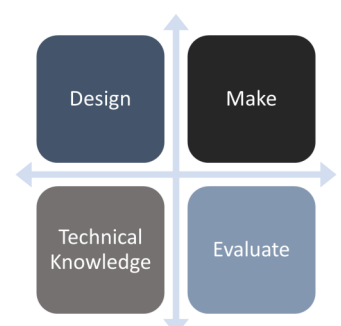
**Challenge!** Can you add more keywords you have covered?



## Challenge!

What areas of the four key concepts for Design & Technology have you worked in during this cycle?

Circle your response



Week	Content	Completed?	
		Y/N	EFFORT
5&6	<p>Lesson 21</p> <ul style="list-style-type: none"> <li>• Movement</li> <li>• Forces &amp; Stresses</li> </ul> <p><i>Homework 9: Complete the worksheet—flipped learning topics</i>  <i>Challenge: Add further components to INPUT &amp; OUTPUT</i>  <i>Further Challenge: Add Dis/Advantages to types of energy sources</i></p> <p>Homework topics:</p> <ul style="list-style-type: none"> <li>• <i>Systems: inputs; Outputs and Processes</i></li> <li>• <i>Quality Control &amp; Quality Assurance</i></li> <li>• <i>Energy Generation &amp; storage</i></li> </ul> <p>Lesson 22</p> <ul style="list-style-type: none"> <li>• Homework review</li> <li>• Environmental considerations</li> <li>• Drawing: isometric &amp; orthographic</li> </ul> <p><i>Homework 9: Complete the worksheet—flipped learning topics</i>  <i>Challenge: Research specific properties of different materials</i>  <i>Further Challenge: Create own revision for Mock 1</i></p> <p>Homework topics:</p> <ul style="list-style-type: none"> <li>• <i>Material properties</i></li> <li>• <i>Papers &amp; boards</i></li> <li>• <i>Kevlar</i></li> <li>• <i>Primary &amp; secondary data</i></li> </ul> <p>Lesson 23</p> <ul style="list-style-type: none"> <li>• <i>Homework review</i></li> <li>• <i>Revision mock test</i></li> </ul> <p><i>Mock exam week 6</i></p>		

## Student Self Evaluation

Cycle 3

WWW	
EBI	

Cycle 4

WWW	
EBI	