

Year 11 Guided Revision

Subject: Engineering Manufacturing



Wb 5th January	Interpreting orthographic third angle projection drawings Engineering drawings: Line types, Standard conventions, Abbreviations, Mechanical features. Recall, Identify and Explain	Useful links Introduction to orthographic drawing
Wb 12th January	Engineering Properties (Mechanical) • strength ○ yield/tensile ○ compressive • elasticity • ductility • Hardness. • malleability • machinability • cost ○ material ○ manufacturing • sustainability Recall and define each of the mechanical properties associated with engineering materials.	Material Properties 101 - YouTube
Wb 19th January	Engineering Materials Metals: Ferrous, Non Ferrous and alloys Caretergoies, types and uses. Plastics: Thermo & Thermosets and there applications Recall and explain the properties, typical forms of supply and processes that can be used with polymers. Give at least one common application of polymers. Ceramics: Recall and explain the properties, typical forms of supply and processes that can be used with ceramics and composites. Give at least one common application of ceramics and composites. Smart Materials: Recall and explain the properties, typical forms of supply and processes that can be used with smart materials. Give at least one common application of smart materials	Alloys - Metals and alloys - GCSE Combined Science Revision - BBC Bitesize (bbc.co.uk) Ferrous and non-ferrous metals - Material categories and properties - GCSE Design and Technology Revision - BBC Bitesize (bbc.co.uk) Thermoplastics (plasticseurope.org) Education Kits (bpf.co.uk) Ceramics - their properties, manufacture, and everyday uses (explainthatstuff.com) 10 Surprising Examples of Composite Materials – (smicomposites.com) Smart materials - Nanoscience and smart materials (bbc.co.uk) GCSE Chemistry Revision - BBC Bitesize (bbc.co.uk)

Wb 26th January	Types of manufacturing processes Wasting: Sawing, Filing, Shearing, Threading, Routing, Laser cutting, Turning, Milling Recommend and justify what the processes and what they are most suited to when creating a manufactured form.	Section A: Fact Files - Method of Processing Materials Part 1.pdf (ccea.org.uk) How to use a hacksaw - YouTube Skillbuilder: 5 Tips for Using Files - YouTube Everything You Need to Know About Taps & Dies - Gear Up With Gregg's - YouTube How to Cut Aluminum with a Router - YouTube (note use of the US term 'Aluminum' for Aluminium) How does laser cutting work - Basics explained - YouTube The Centre Lathe (technologystudent.com) Learning to Use a Lathe, Part 1: Basic operation and facing cut - YouTube The Vertical Miller (technologystudent.com) Vertical Mill Tutorial 1: The Basics - YouTube
Wb 2nd February	Types of manufacturing processes Shaping: Moulding, Casting Recommend and justify what the processes and what they are most suited to when creating a manufactured form.	Plastic Injection Moulding - YouTube Powder Metallurgy Process - YouTube Casting Metal: the Basics - YouTube (shows sand casting) What is the Die Casting Process? The High Pressure Die Casting Process - YouTube
Wb 9th February (PPE 2)	Types of manufacturing processes Forming: Forging, Pressing, Heating, Moulding composites. Recommend and justify what the processes and what they are most suited to when creating a manufactured form. Types of manufacturing processes Additive processes Recommend and justify what the processes and what they are most suited to when creating a manufactured form.	Blacksmithing - Forging An Axe - YouTube Top 5 Amazing Forge Videos - YouTube Factory to Forecourt - Press Shop - YouTube How to use the strip heater - YouTube Making Complex Carbon Fibre Tubes Using a Split-Mould - YouTube Fused Deposition Modelling (FDM) Technology - YouTube
Wb 16th February	Half term - independent revision Recap Term 3 content	
Wb 23rd February (PPE 2)	Types of manufacturing processes Joining: Riveting, Mechanical fastening, Brazing, Welding Recommend and justify what the processes and what they are most suited to when creating a manufactured form. Types of manufacturing processes Finishing Recommend and justify what the processes and what they are most suited to when creating a manufactured form.	Common Metal Shop Tools: Riveting - YouTube What is a Pop Rivet? Design Squad - YouTube Nuts and Bolts Sheet 1 (technologystudent.com) Types of Screws (technologystudent.com) What is Brazing? Skill-Lync - YouTube What is MIG Welding? (GMAW) - YouTube The Basics of How to Use an Automotive Paint Spray Gun - YouTube What Is Powder Coating? New Wheels For The S2000! - YouTube

Wb 2nd March	Scales of manufacture: One-off, Batch, Mass Recall and explain scales of production, identify at least one product under one-off, batch and mass. Describe how jigs, fixtures, templates, and moulds are used including advantages and limitations of each.	Scales of production STEM Learning (stem.org.uk) Templates, jigs and patterns - Making –GCSE Design and Technology Revision - BBC Bitesize (bbc.co.uk) Jigs and Fixtures for Machine Shops - Educational Video - YouTube (video is dated but very useful) Jigs & Fixtures - YouTube
Wb 9th March	Automation in engineering manufacturing: Describe different levels of automation with typical products manufactured using each.	The Future of Factory Automation - YouTube Computer Aided Manufacturing (CAM) - YouTube Industrial Robots have Transformed the Manufacturing Industry - A Galco TV Tech Tip - YouTube Design and Technology KS3/4: Why is CAD/CAM essential in design? - BBC Teach (bbc.co.uk) Advantages and Disadvantages of CAD/CAM - Advantages and disadvantages table in All Levels Design & Technology: Resistant Materials (getrevising.co.uk)
Wb 16th March	CAM (Computer Aided Manufacture) Recall and describe the advantages and limitations of CAM. Consolidate knowledge of the influences on scale of manufacture, solving example problems	Design and Technology KS3/4: Why is CAD/CAM essential in design? - BBC Teach (bbc.co.uk) Advantages and Disadvantages of CAD/CAM - Advantages and disadvantages table in All Levels Design & Technology: Resistant Materials (getrevising.co.uk)
Wb 23rd March	Quality systems Recall and explain the reasons for implementing quality systems. Recall and explain the difference between quality control and quality assurance. Explain how quality control is used as a reactive approach by measuring parts. Explain how quality assurance is used as a preventative approach to reduce occurrence of defects.	Audi Factory Quality Control - YouTube FAA reviews Boeing Dreamliner quality control lapses after production - YouTube The Cost of Poor Quality - YouTube 5 Major Differences between Quality Assurance and Quality Control Testing (rezaid.co.uk) Quality Control Process for QA1 Rod Ends - YouTube Quality Assurance (technologystudent.com) What to know about quality assurance (Monday.com blog) Factory to Forecourt - Quality Assurance - YouTube Top-10 Mechanical Measuring Instruments (Every Mechanical Engineer should know)) - YouTube Quality Management - Quality Assurance - YouTube

Wb 30th March	Inventory management Recall and briefly explain the meaning behind inventory management and lean manufacturing. Lean manufacturing JIT (Just In Time) Recall the definition of JIT. Explain JIT including its advantages and disadvantages. Material Requirements Planning (MRP) Recall the definition of MRP. Explain MRP including its advantages and disadvantages.	What is MRP (Material Requirements Planning)? Why is it Important? - YouTube What is Material Requirements Planning? - YouTube
Wb 6th April	Easter holidays - independent revision Recap term 4 content	
Wb 13th April	Easter Holidays - independent revision Recap term 4 content	
Wb 20th April	Lean manufacturing cntd Seven categories of waste Seven categories of waste: Recall and describe the seven categories of waste. • transportation • inventory • movement • waiting • over-processing • over-production • defects.	The seven wastes of lean (leanmanufacturingtools.org) The 7 wastes of lean - YouTube
Wb 27th April	• Globalisation • Recall and briefly explain the meaning behind globalisation in a manufacturing context. • • Transport & International standards • Explain how transportation and international standards impact global manufacturing. • • Employment • Explain the significance of employment to global manufacturing including opportunities and conditions. • • Product cost • Explain the impact of global manufacturing on product cost.	Effects of Economic Globalization National Geographic Society (nationalgeographic.org) Globalization and its effects on developing countries. - YouTube International Trade and Supply Chains - YouTube DHL Inbound to Manufacturing - Overview - YouTube Why Chinese Manufacturing Wins - YouTube Inside Apple's iPhone Factory In China - YouTube Costs and benefits of globalisation (Economics Help)
Wb 4th May	Globalisation cntd Product cost	Globalisation and product manufacture (stem.org.uk)

	Explain the impact of global manufacturing on product cost. Sustainability & Economic, social, ethical, environment Explain the impact of globalisation on sustainability, economics, social, ethical, and environmental considerations.	
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