Topic: Engineering, Problem Solving. Exam Revision (*exam taken in year 10)* **SPR 2**		**Duration: 12 lessons**	**Composite:**
Key vocabulary:	**Core knowledge Components**	**Powerful knowledge components crucial to commit to long term memory**	**Links to previous and future topics**
Ferrous, Non-ferrous, alloy, thermosetting, thermoplastic, smart material, composite material, tensile strength, compressive strength, hardness, malleable, ductile, corrosion resistant, elasticity, conductivity, Efficiency, area, volume, Ohms Law environmental impact, sustainability, raw materials, ore, extraction, modular, repair, recycle, re-use, re-think, reduce, disposal, transportation, pollution, green house gases, packaging. Solder, simulation, uv-sensitive, ,etch, ferric chloride, track, pad, multimeter, Aluminium, mild steel, stainless steel. Copper,Cast iron. ABS, HIPS, Acrylic, CAD/CAM, Orthographic Isometric, Section View	• What are the key engineering developments of the 21st century? • What are the effects of engineering achievements in the home, industry and society? • How can a designer reduce the environmental impact of their design? • How can manufacturing reduce the environmental impact of production? • Choose and justify a material choice for a Structural, mechanical or electronic product? • What is the name of the tool/equipment? • What is the name of the measuring equipment? • What is the name of the process? (• How are specific materials properties tested in a school workshop? • Identify appropriate permanent or temporary fixings for an application • What are the advantages/disadvantages of CAD/CAM to a designer/ manufacturer? • What is the area ot the shape? • What is the volume of the shape? • What is the current, voltage or resistance using Ohms Law? • What is the efficiency of the machine? Draw a component in isometric Draw a component in 3rd angle orthographic Convert a drawing between isometric and orthographic	• What is a definition for each key classifications shown (Ferrous, Non-Ferrous, Thermoplastic, Thermosetting, Smart, Composite, Modern)? • Name materials and material key properties in each material classification groups? • What is a definition for each property shown? Tensile strength, compressive strength, torsion, hardness, malleable, ductile, conductive, corrosion resistant, elasticity. • What is the difference between a destructive and non-destructive test? • What forms can each material type be purchased in (metal, plastic)? • What are the names of the 5 plastic forming processes? • What is the equation for efficiency? • What is the equation for area of square, triangle, circle, parts of circles? • What is the equation for calculating volume of square, cylinder, prism? • What does sustainability mean? What does bio-degradable mean? • What are the 5 stages of a product life cycle? • What technological developments have enabled new/modern products? • What are annealing, normalising, hardening, tempering, case hardening, anodising and galvanising? • How is a pcb produced? How do you solder safely? What does each universal symbols represents? What is the equation for Ohms Law? • What are the following processes, drilling turning, milling, brazing, welding, tapping)? Where and how do you do them safely? • Name a selection of temporary and permanent joints • What is a section view? What are construction lines, centre lines, hidden detail and standard conventions? What is the symbol for 3rd angle orth.? • What is included in a title block? • What are isometric and orthographic drawings? How are they different? • What is CAD/CAM? Name specific examples where it is used? • What does CNC stand for?	Using knowledge learnt throughout years 7, 8, 9 and 10. Year 7- material, material groups properties, Year 8 Electronics Year 9- Drawing, tools, equipment, processes, inspection, area, units. Year 10 – Electronics Drawing, structures, mechanisms, environment. Links to science, geography.

Impressive reading	**Impressive speaking**	**Impressive writing**	**Resilience**	**Employability via:**
Reading and understanding of exam questions.	Taking part in class discussions.	Use of appropriate technical terms exam answers	Confident choices when answering practise exam questions. Find and correct own mistakes on practise questions.	Independent decision making and problem solving Using technical language that shows maturity, confidence and understanding. Applying skills to problem solving questions

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- Linked to prior knowledge from year 7,8, 9 and 10 to aid independence. Repeating of key themes.

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- Additional curriculum time allocated to those authorised by exam board, to support processing speed.
- Project chosen so that work produced can be used at apprenticeship or engineering interviews, work-related to support the pathway into adulthood
- Project chosen to support cross curricular links maths and science, supporting non-verbal reasoning
- Technology: software (word, powerpoint) used to support accessibility
- Skills ordered logically and as individual tasks to support accessibility
- Opportunities for low entry/high ceiling activities (grading from Level 1 to Level 2 Dist *), supporting learner aspirations