Ian Ramsey CE Academy: Vocational Engineering Manufacture Curriculum Progression Model

CURRICULUM OVERVIEW

Curriculum What we study. Why study it. Why study it now.

What we need pupils to have learnt at each point/end of each year and the logical connection and the sequential learning between what is studied in the different terms and between years. This is what is to be covered and when, effectively creating the idea that the intent *is* the curriculum. The intent is everything up to the point of teaching. The purpose of our curriculum and the knowledge we want our pupils to go away with in their working memory.

Vocational engineering manufacture is a hands-on practical subject for pupils interested in manufacturing in metals and polymers. Projects are focussed practical tasks with an emphasis on learning new manufacturing skills with very high levels of accuracy. Industrial standards are used to prepare pupils for the world of work using hand skills and CAD/CAM equipment. NEA tasks are set from the exam board and technical drawings are provided for pupils to manufacture from.

How we teach the curriculum

How we make learning memorable and how we support our pupils to remember it. How we use rote, retrieval, interleaving, metacognition etc. in our teaching; why we teach in the way we are and justify decisions around how and why it's being taught this way.

What we expect from the curriculum

How we make it challenging and ambitious for our pupils. How we assess learning, knowledge and understanding; what have they learnt and how well have they learnt it? Consider what assessments we use, when we use them and how and why we assess this way?

OCR Vocational Engineering Manufacture

Setting		Designing		Planning		Delivering	
What: Desk Tidy and Phone Stand Project	**What:** Headphone stand project.	**What:** Tool tray and amplifier.	**What:** Complete R110 NEA	**What:** R110 NEA and R109 Revision	**What:** Complete exam 109, then study CAD/CAM	Teaching and learning is predominately practical. Pupils will learn a wide variety of skills which will be repeated to increase skill level and accuracy. Diagrammatic reference materials are used to reinforce recall of process, tools, and equipment. Pupils draw on principles of manufacture introduced in KS3 such as scale, industrial practice and quality control and assurance.	Assessment for Learning is used in all lessons to provide evidence for use by pupils and teachers to decide where pupils are in their learning, where they need to go and how best to get there. **Formative Assessment** This is used to provide information about what pupils know, understand, and can do. This is used by both the teacher and the pupil to determine where pupils are in their learning and how to continue to develop their knowledge and skills within the subject. This will include: • Questioning • Effective teacher feedback (written and verbal) • Peer feedback. • Pupil self-assessment **Summative Assessment** This is also used at key points in each year to evaluation pupils' achievement. These allow a holistic view of pupils' performance and support the identification of areas requiring additional focus to improve learning overall.
What: Introduction to engineering materials and basic hand processes in preparation for R109 LO1 and LO2. Gain a working knowledge of metals and polymers, marking out, cutting, and filing tools, and drilling. Understand how metals and polymers are shaped. Learn essential workshop health and safety.	**What:** Introduction to orthographic drawing and risk assessments in preparation for NEA. Practical develops knowledge of using the laser cutter, manual lathe, and quality control in preparation for R109 and R110.	**What:** An introduction to the use of tolerances, Jigs, templates, quality control and use of the milling machine for R109 and R110. Practical knowledge of sheet metal work, using the guillotine, box folder, joining methods and riveting for R109.	**What:** This is the unit requiring manufacturing with machinery. Practical skills will focus on QC, working within tolerance, introduction to practical milling and turning. The learning for R109 will continue with LO1 – properties of materials and LO2 – Engineering processes.	**What:** Completion of required unit for internal assessment. Exam revision of R109 LO4 to cover new technology and the impact on manufacture. Revision and exam practise is needed for June's exam, and it also helps prepare for R111 NEA which is CAM.	**What:** Final revision, then sit R109 examination June series for attempt 1 of 2. Preparation begins for R111. R109 LO3 - The developments in engineering will be covered to include CAD/CAM and CNC. This will also prepare for NEA R111.		
Why now: Intro to workshop environment and engineering materials. Preparation for R109 in June.	**Why now:** Preparation for R109 & R110. Gain knowledge in preparation for NEA.	**Why now:** Preparation for R109 in June. Knowledge gained in preparation for R110.	**Why now:** Content for R110 has been covered. Continued preparation for R109.	**Why now:** Revision is needed for 1st attempt of exam unit in May/June. LO4 covered as has not been covered so far.	**Why now:** Sitting R109 in June in Year 10 allows for a second entry in Year 11. Preparation for NEA R111 in Year 11.		
What: Ear bud holder	**What:** Complete R111 NEA	**What:** Dog Tags	**What:** Machine Vice	**What:** Revision			
What: Learn about additive manufacture, rapid prototyping, and CAD/CAM in preparation for R109 LO3. Learn moulding processes for R109 LO2. Gain working knowledge of creating a 3D CAD model, using the 3D printer and vacuum former. Practice use of CNC machine for R111.	**What:** Unit requiring manufacturing with CNC machinery, building on their prior learning. Practical skills will focus on QC, working within tolerance, introduction to CNC milling and turning. The learning for R109 will continue with LO1, 2 & 3. Mini project to be completed between mock exams.	**What:** Unit requiring knowledge of quality control, quality assurance and testing. The learning for R109 will continue with LO1 and LO4. Mini project to be completed between mock exams.	**What:** Introduction to threading, moulding, and casting in preparation for R109 LO1 & LO2. Gain working experience of using a tap and die to create a thread, temporary fixings, pewter casting, and injection moulding in preparation for R109. Mini project to be completed between mock exams.	**What:** This learning is recall, revision and extension of all 3 LO in R109. This will be done with a focus on completing past paper questions to further develop exam technique.			
Why now: Producing artefacts using CAD/CAM milling and turning teaches the basics for R111 sat in November of Y11 to relieve DT NEA congestion in May.	**Why now:** Pupils now have the knowledge needed to complete NEA R111. Continued preparation for R109. Mini project between mock exams and prepare for R109.	**Why now:** Pupils now have the knowledge needed to complete NEA R112. Continued preparation for R109. Mini project between mock exams and prepare for R109. .	**Why now:** By now, we have completed all 3 NEA modules. Mini project between mock exams and prepare for R109.	**Why now:** R109 sat in June to give the second examination chance to students to improve their grades.