

<b>Topic: Engineering Design – Isometric Drawing and Using a Lathe SUM 1</b>			<b>Duration: 12 lessons</b>	<b>Composite:</b>
<b>Key vocabulary:</b>	<b>Core knowledge Components</b>		<b>Powerful knowledge components crucial to commit to long term memory</b>	<b>Links to previous and future topics</b>
Isometric. stencil, compass, drawing board, protractor, set square, isosketch. Crating. Epoxy resin, contact adhesive, tensol cement. Emergency stop, guards, safety, goggles, sturdy footwear, microswitch. Coolant, toolpost, headstock, tail stock, dead centre, chuck key, 3 jaw chuck, auto-traverse, parting tool, morse taper. Turning, knurling, facing off, High speed steel, cutting, feedrate, data sheet,	<ul style="list-style-type: none"> <li>• How do you use isometric paper?</li> <li>• What is a stencil, compass, drawing board, protractor, set square, isosketch?</li> <li>• How can crating help you draw isometric?</li> <li>• How do you dimension an isometric drawing?</li> <li>• What shape is a circle in isometric?</li> <li>• When and how are the adhesive epoxy resin, contact adhesive and tensol cement used?</li> <li>• Why is a coolant used?</li> <li>• What does the toolpost do?</li> <li>• Where is the headstock? Where is the tail stock?</li> <li>• Why is the material held at both end, by a dead centre, when turning a long piece of material?</li> <li>• Why must material be held at both ends when knurling? Is knurling done at a fast or slow speed?</li> <li>• What are the tools used on a lathe made from?</li> <li>• What factors affect the cutting and feedrate of a lathe?</li> <li>• How do you know what cutting and feedrate to set a lathe at?</li> <li>• Why does the chuck key have a spring on it?</li> </ul>		<ul style="list-style-type: none"> <li>• What angle is isometric drawn at?</li> <li>• IS isometric 2 D or 3D?</li> <li>• Which part of an isometric sketch is facing you?</li> <li>• What is crating?</li> <li>• What is an isosketch?</li> <li>• Must be able to generate a range of realistic design ideas in isometric and annotate them (using isometric paper/isosketch or 3D software).</li> <li>• What materials / program can be used to produce a 3D?</li> <li>• What does a lathe do?</li> <li>• Name 5 specific safety requirements when on a lathe?</li> <li>• What ppe must be worn when using a lathe?</li> <li>• What is facing off? What is turning? What is knurling?</li> <li>• What is a 3 jaw chuck?</li> <li>• What is auto-traverse?</li> <li>• Which is the x, y and z axis?</li> <li>• What are cutting rate and feed rate?</li> </ul>	<p>Application of core drawing skills previously taught in year 9.</p> <p>Further extending knowledge of machinery, covered a wide range of tools and techniques in year 9.</p> <p>Further extension of technical software, covered in year 8 and 9.</p> <p>Maths use of set squares (angles).</p>
<b>Impressive reading</b>	<b>Impressive speaking</b>	<b>Impressive writing</b>	<b>Resilience</b>	<b>Employability via:</b>
Understanding requirements of tasks.	Using appropriate technical terms when answering questions.	Use of appropriate technical terms in annotation.	Find and correct own mistakes and problem solve	Independent time management. Independent decision making and problem solving Using key skills used by engineers. Later visit to college.
<b>SEND</b>				
<b>Key Vocabulary introduced using precision teaching prior to new topic.</b>				
<ul style="list-style-type: none"> <li>• Linked to prior knowledge from year 8 and 9 to aid independence. Repeating of keywords.</li> <li>• Additional curriculum time allocated to those authorised by exam board, to support processing speed.</li> <li>• Project chosen to aid visit to Marches, so that pupils feel some familiarity when go to outside College.</li> <li>• Learners asked to complete work that will enable them to get Dist * grade, supporting learner aspirations</li> <li>• Project chosen to support supporting non-verbal reasoning</li> <li>• Technology: software (3D design software) used to support accessibility. An option for those that struggle with drawing.</li> <li>• Skills ordered logically and as individual tasks to support accessibility</li> <li>• Opportunities for low entry/high ceiling activities (grading from Level 1 to Level 2 Dist *)</li> </ul>				

