

## GCSE ENGINEERING UNIT 4 Overview – Completion date:

You will:

Learn how different structures are constructed and stressed.

Be able to analyse simple structures and use technical language to describe the forces acting.

Design and test structures to perform specific tasks and calculate safe loads.

Use sand casting techniques to produce aluminium parts.

Understand heat treatments and how metal properties can be changed.

<b>Lesson Overview</b>  <ol style="list-style-type: none"><li>1. Types of structures, space frame and monocoque, their advantages and disadvantages.</li><li>2. Designing and testing simple structures, calculating forces and safe loads.</li><li>3. Analysis of failed structures and joints, repeatability of testing and the reliability of our results.</li><li>4. Sand casting</li></ol>	<b>Key Words</b> <ul style="list-style-type: none"><li>• See key words lists in showbie.</li></ul> <table border="1"><tr><td>Compression</td><td>Load</td></tr><tr><td>Tension</td><td>Torsion</td></tr><tr><td>Stress</td><td>Shear</td></tr><tr><td>Strain</td><td>Crucible</td></tr><tr><td>Truss</td><td>Cope</td></tr><tr><td>Beam</td><td>Drag</td></tr><tr><td>Cantilever</td><td></td></tr><tr><td>Monocoque</td><td></td></tr></table>	Compression	Load	Tension	Torsion	Stress	Shear	Strain	Crucible	Truss	Cope	Beam	Drag	Cantilever		Monocoque	
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	<b>Cross curricular</b> <b>Science:</b> Metallurgy and heat treatments link to chemistry syllabus, crystal growth etc. <b>Physics:</b> calculations of stress and strain, moments and forces. <b>Maths:</b> Angles and trigonometry, calculating load factors and use of probability and statistics. <b>SMSC:</b> Safe loads bring out the discussion of the responsibility and accountability of engineers and their designs. Integrity of testing and reporting, the balance between cost and risk. <b>Literacy links:</b>																