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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y12** | **Topic: 3.4.2 Materials** |

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| ***What and Why*** “What are the required properties of materials for specific tasks. Requirements could include the object been elastic, brittle, ductile, malleable, strong or tough. Why is it important to know the strength of a material and how it behaves under various conditions? A method to investigate these factors involves knowing the Young’s modulus of the material.” |

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| **Key terms**  Alloy  Breaking stress  Brittle  Density  Ductile | Elastic deformation  Elastic energy  Elastic limit  Extension  Hooke’s law  Limit of Proportionality | Mass  Load  Pascal  Plastic deformation  Spring constant  Stiffness | Strong  Tensile strain  Tensile stress  Ultimate tensile stress  Volume  Yield point  Young’s Modulus |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.4.2.1:** I can determine the density of regular and irregular objects.  I can apply the Hooke’s law equationand plot a graph and find the spring constant.  I can determine the elastic energy and by using a graph or by calculation.  I can describe elastic, plastic, fracture and brittle behaviour.  I can interpret stress-strain graphs  **3.4.2.2:** I can calculate the Young’s modulus mathematically and graphically.  To describe a method to determine the Young’s modulus | Use the Oxford AQA AS textbook p.184-193. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) Young’s modulus, required practical  <https://www.youtube.com/watch?v=aGS_tYML3HQ>  (2) Brittle and ductile failure  (3) Hooke’s law: mechanical properties of solids    **Websites:**  <http://physicsnet.co.uk/a-level-physics-as-a2/materials/young-modulus/>  <https://coolscienceexperimentshq.com/simple-experiments-to-learn-about-density/> | **Practicals:**  (1) Required Practical 4:  Determination of the Young’s modulus of copper  (2) Determine the spring constant using Hooke’s law  **Assessment**:  Minitest on Materials (4th week Jan)  Multiple choice test on Mechanics (1st week Feb) | (1) Review the key terms  (2) Research and produce a report on the use of materials (CPAC 5)  Make notes on each topic and complete the exam style practice questions | (1) School visit: Millennium  Bridge. Measurements to  analyse data in the lab  **Reading:**  Blade of Light: The Story of the  Millennium Bridge  By Deyan Sudjic |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment | | |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs | Timed conditions |
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