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| **YEAR 2021-2022 \_\_\_\_\_ TERM**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Materials** | |
| **Curriculum Intent** | **In addition to working further on objectives from Year 12, pupils will be taught, following National Curriculum guidelines, the following this term:** |
| **Skills/Assessment Objective Links** |
| **Spiritual, moral, social, and cultural development** | **SMSC:**  Listening to each other and valuing each person’s contributions in discussions, working together in lessons to problem solve and achieve a shared goal. Learning about different scientists and learning how their understanding of the world evolved.  **PSHE/British Values:**  Working together in practical and problem-solving work. The practical work in this section requires two people to work together to take the measurements whilst holding the equipment in place.  **Skills Builder:** development of practical skills through the numerous practical activities. |
| **Numeracy** | Constant numerical development in every lesson. Measuring skills, graph skills, problem solving. Exam questions build on topics with mechanics components frequently brought in. |
| **Literacy** | **Vocabulary Tier 2:** density, weak, strong, stiff, tough, brittle, Hooke’s Law  **Vocabulary Tier 3:** Limit of proportionality, eureka can, plastic deformation, elastic limit, yield point, UTS, elastic potential energy, Young modulus, tensile stress, tensile strain, hysteresis.  **Reading:** Reading of the booklet and questions. Students need to be able to read the methods for practical lessons and ensure they complete them in the right order, using the right equipment.  **Writing:** Students are exposed to a number of questions, both numerical and short and long written answers. Students need to be able to write in a concise way whilst using the key words.  **Oracy:** Class discussions are incredibly important in physics where students regularly participate in class discussion to discuss abstract concepts. Students need to be able to express their understanding of concepts and theories. |
| **Becoming future ready** | **Careers/Employability:** The topic of materials is key for engineering, specifically civil engineering plus architecture. |
| **Adaptation** | Throughout this topic, quality first teaching will provide differentiation:  **By product:**  different learners are asked different questions, different level of detailed responses are expected and the level of scaffolding for the problem solving questions are varied.  **By resource:**   All resources are the same, however, extra scaffolding may be provided if necessary.  **By Intervention**: by providing different levels of supervision and support  **By Progressive Questioning:** exploring pupils’ understanding through interactive dialogue.  **By Grouping:** according to prior attainment, gender, social preference, preferred learning style.  **By Task:**Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.  **By Offering Optional Activities:** In class or as homework, to extend learning.  This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work. |
| **QFT/SEND Provision** |
| **Implementation**  **Curriculum Delivery** | * To be able to:  |  | | --- | | * To know how to calculate the density of a regular shaped object. | | * To know how to calculate the density of an irregular shaped object. | | * To know how to calculate the density of an alloy. | | * To know how to use and apply the formula for Hooke's Law | | * To determine the spring constant of a spring | | * To be able to sketch a Force - extension graph and label key points | | * To know the definitions and formulas for stress and strain | | * To know that different materials respond in different ways. | | * To know what brittle, ductile, strong materials are the know how to draw the graphs. | | * To know how to conduct the practical on different materials safely. | | * To understand how each object behaves under tensile stress. | | * To draw the tables and graphs appropriately for the stretchy men practical. | | * To understand Young's Modulus. | | * To know how to rearrange the equation & understand the formulas | | * To complete the example exam questions on the topic with confidence. | | * To complete the practical on The Young Modulus of a Wire |   Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | The topic of materials comes up with mechanics too, with the questions often being linked. Materials is also linked in with waves, when the composition of waves produced on stringed instruments are analysed. |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |

