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| **YEAR 2022-2023 Second TERM**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Waves** | |
| **Curriculum Intent** | **In addition to working further on objectives from Year 11 Physics, 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: wavelength, frequency, transverse, longitudinal, speed, stationary wave**  **Vocabulary Tier 3: node, antinode, modal dispersion, optical fibre, phase difference, polarization, pulse broadening, refractive index, Snell’s law, Young’s Double Slit experiment.**  **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:** Waves links in with music as well as light waves. All waves are explored here, from microwaves and their use in astronomy to their use in communications. |
| **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 and understand longitudinal and transverse waves, explaining the motion of the particles | | | * To be able to describe displacement - displacement graphs and displacement - time graphs | | | * To be able to explain phase difference in waves using degrees and radians. | | | * To be able to calculate wave speed | | | * To be able to understand and explain polarisation | | | * To be able to explain superposition of waves | | | * To be able to explain how stationary waves form | | | * To know about stationary waves in instruments. | | | * To be able to describe interference. | | | * To be able to explain what a coherent source is | | | * To understand Young's Double Slit Experiment | | | * To be able to apply the theory to the booklet/exam questions | | | * To know and understand diffraction | | | * To be able to draw and explain the intensity pattern for narrow and wide slits | | | * To derive and apply the diffraction grating equation | | | * To be able to apply the theory to the booklet/exam questions | | | * To know that waves can be transmitted, reflected or absorbs. | | | * To understand refraction | | | * To measure refraction of a Perspex block | | | * To know and apply Snell's Law | | | * To know, understand and apply TIR & critical angle. | | | * To complete exam questions on refraction | | | * To know the uses of optical fibres. | | | * To know and explain material dispersion. | | | * To know and explain modal dispersion. | | |  |  * Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | The students use this information in the quantum physics with de Broglie waves. |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |

