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| **YEAR 2022-2023 First TERM**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Further Mechanics** | |
| **Curriculum Intent** | **In addition to working further on objectives from Year 12 Further Mechanics, 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: time period, speed, velocity, banked track, horizontal components, vertical components, restoring force, displacement, amplitude.**  **Vocabulary Tier 3: angular displacement, angular velocity, angular speed, orbital speed, radian, periodic motion, mechanical oscillation, simple harmonic motion, angular frequency, phase difference, free oscillation, critically damped, damping, natural frequency, forces oscillation, driving frequency, resonance, resonant frequency, stationary waves.**  **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:**  mechanics is key for engineering and maths. The building |
| **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 booklets are the same, however, extra scaffolding and extension may be provided from the new Kerboodle resources.  **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 apply Newton's Laws | | To recall and know how to derive Newton's second law. | | To know and apply momentum and impulse to the exam questions. | | To know how to convert from radians to degrees. | | To understand and apply the formulas for linear and radial speed. | | To explain the difference between radial and linear speed. | | To understand and apply the centripetal force formula to exam questions | | To apply centripetal force and acceleration to a Banked Track, vertical circle and Conical Pendulum | | To apply the knowledge to the exam questions (continue questions into next lesson). | | To understand the conditions for SHM & formulas | | To explain SHM for a pendulum bob (equations and energy). | | To explain SHM for a mass on a spring (equations and energy). | | To be able to draw and derive the graphs for displacement, velocity and acceleration. | | To apply the knowledge and formulas of SHM to the exam questions | | To derive the formula for the time period for a mass on a string. | | To analyse what the graph will look like and compare to y = mx+c | | To derive the formula for the time period for a pendulum bob | | To analyse what the graph will look like and compare to y = mx+c | | To be able to draw the graphs of GPE and KE for SHM. | | To understand damping and why it might be used. | | To understand and explain resonance. | | To watch the video of the slow mo tennis ball and look at what happens during resonance. | | To explain the Barton Pendulum | | To Complete the required practical | |  * Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** |  |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |

