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| **YEAR 2022-2023 First TERM**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Mechanics** | |
| **Curriculum Intent** | **In addition to working further on objectives from GCSE Maths and 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: magnitude, speed, distance, acceleration, equilibrium,**  **Vocabulary Tier 3: scalar, vector, displacement, velocity, instantaneous velocity, resultant, resolving components, tangent, linear motion, freefall, drag, air resistance, terminal speed, trajectory, center of mass, projectile motion, coefficient of friction, contact force, equilibrium, polygon of forces, principle of moments, couple, torque, momentum, impulse,**  **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:**  There are many links to different parts of engineering: mechanical, civil, aeronautical. |
| **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:  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | ***Lesson Objectives*** | | 1. To recap on scalars and vectors | | 2. To recap on adding and subtracting vectors. | | 2. To recap on trigonometry: sin, cos and tan. | |  | | 1. To know how to add vectors at an angle and calculate the angles. | | 2. To know how to add vectors at angles. | | 3. To know how to resolve forces along a slope. | |  | | 1. To know how to complete the parallelogram of forces. | | 2. To complete the practical on resolving forces. | | 3. To apply this information to exam questions. | |  | | 1. To know how to resolve forces when objects are in equilibrium. | | 2. To know how to complete the examples covered in the booklet | | 3. To apply this information to exam questions. | |  | | 1. To know the definition for a moment. | | 2. To know the definition of the centre of mass. | | 3. To understand and explain the principle of moments. | |  | | 1. To apply the knowledge on moments to the exam questions. | |  | |  | | 1. Complete the practical on moments. | | 2. Complete the exam questions on moments. | |  | | 1. To know the definition of displacement, velocity and acceleration. | | 2. to know how to describe displacement time graphs. | | 3. To know how to describe velocity time graphs. | |  | | 1. To know the definition of displacement, velocity and acceleration. | | 2. To derive the SUVAT equations | | 3. To apply the equations to the exam style questions. | |  | | 1. To apply the SUVAT equations to the exam style questions. | |  | | 1. To understand how free fall affects the SUVAT equations. | | 2. To apply the free falling knowledge to a parachute. | |  | | 1. To complete the required practical: Determination of g by free fall. | |  | | 1. To know the properties of the vertical and horizontal components in projectile motion. | | 2. To explain the Monkey and Hunter experiment. | | 3. To complete the exam questions on projectile motion. | |  | | 1. To complete the questions on projectile motion and free fall. | |  | | 1. To know and explain Newton's First Law | | 2. To know and explain Newton's Second Law. | | 3. To apply the knowledge to the exam questions. | |  | | 1. To know and explain Newton's Third Law. | | 2. To complete the exam questions on Newton's Laws | |  | | 1. To know and understand momentum and its units. | | 2. To know the conservation of momentum. | | 3. To apply the knowledge to the exam questions. | |  | | 1. To know and explain Impulse. | | 2. To know and explain elastic and inelastic collisions. | | 3. To explain momentum and car safety. | |  | | 1. To complete exam style questions on momentum. | |  | | 1. To know how to calculate work done at an angle. | | 2. To know and use Power = Force x velocity. | | 3. To know how to calculate GPE and KE plus knowing how to equate them. | | | |  |  * Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | Mechanics is explored further in the Further Mechanics and throughout all of the fields topics when particles move in projectile motion in different force fields. |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |

