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| **YEAR 2022-2023 First TERM**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning – Topic: Gravitational and Electric Fields** | |
| **Curriculum Intent** | **In addition to working further on objectives from Year 12 Gravitational and Electric Fields, 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: gravity, fields, uniform, gravitational constant, gravitational field strength, infinity, electric fields, attraction and repulsion,**  **Vocabulary Tier 3: radial, inverse square law, gravitational potential, equipotential, synchronous orbits, escape velocity, circular motion, electric field strength, electric potential, electrostatic repulsion, trajectory, equipotential.**  **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:**  Links to GPS, satellite design and orbit paths, electric fields uses involved particle acceleration and link to CERN trip, astrophysics and charged particle research, |
| **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:  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | 1. To know what a field is. | | 2. To know and apply Newton's Law of Gravity | | 3. To know and apply the inverse square law. | |  | | 1. To know and apply graviational field strength in uniform and radial fields. | | 2. To be able to draw graphs of gravitational field strength and radius. | | 3. To be able to combine gravitational field strengths as vectors. | |  | | 1. To know and define gravitational potential. | | 2. To be able to draw the graph of graviational potenial and radius plus the meaning of the gradient. | | 3. To be able to calculate the graviational potential energy. | |  | | 1. To know and explain the importance of geostationary orbits | | 2. To prove and use the relationship between T and R. | | 3. To calculate escape velocity (formula not on the sheet). | |  | | 1. Go through main areas of concern in HW | |  | |  | | 1. To recall the formulas from Electricity to use in this topic. | | 2. To know that the force may be attractive or repulsive. | | 3. To calculate the electrostatic force between two charges. | |  | | 1. To know how to draw the field strenght around positive and negative charges. | | 2. To calculate the electric field strength in a radial field. | | 3. To calculate the electric field strength in a uniform field. | |  | | 1. To know and define electric potential. | | 2. To be able to draw the electric potential around positive and negative particles. | | 3. To know how to calculate the motion of charged particles in a uniform electric field. | |  | | 1. Go through main areas of concern in HW | | | |  |  * 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. |

