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| **YEAR \_\_\_\_ 2023-2024 \_\_\_\_\_ TERM: Autumn 1 (Y10)**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Enzymes** | |
| **Curriculum Intent** | **In addition to working further on objectives from KS3 Digestion and KS4 Topic 1 Cell Structure & Transport, pupils will be taught, following National Curriculum guidelines, the following in this topic:**   * the fundamental units of living organisms are cells, which may be part of highly adapted structures including tissues, organs and organ systems, enabling life processes to be performed more effectively * cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells * enzymes * factors affecting the rate of enzymatic reactions * carbohydrates, proteins, nucleic acids and lipids as key biological molecules. |
| **Skills/National Curriculum Links** |
| **Spiritual, moral, social, and cultural development** | **SMSC:** Diet, digestive system  **PSHE/British Values:**  Peer review – the development of the lock and key theory of enzyme action  **Skills Builder:** Manipulation of |
| **Numeracy** | Calculations required in the topic include conversion between units of measurement (length) and magnification calculations. This also includes formula rearrangement using the formula magnification = size of image / size of real object, and expression of answers using standard form.  Calculation of surface area, volume, and surface area to volume ratio |
| **Literacy** | **Vocabulary Tier 2:** organ, organism, pH, digestion, carbohydrate, glucose, protein, fat, saliva, stomach, small intestine, large intestine, soluble, insoluble  **Vocabulary Tier 3:** enzyme, catalyst, active site, denature, lipid, glycerol, fatty acid, lipase, amylase, protease, amino acid, biuret, Benedict’s solution,  **Reading:** Students are given opportunity to develop their skills in specified tasks that develop disciplinary literacy. Throughout the GCSE Biology and Combined Science course they develop their understanding of the requirements of exam questions and the key terminology in questions. In addition, they read practical methodology and translate this to actions in laboratory tasks.  **Writing:** Students construct answers independently and through class teaching. Their answers range from single word answers to the planning and writing of 6-mark “extended writing” tasks that require linking of multiple concepts from a topic. These often develop students’ ability to construct written evaluations of contrasting situations, where the use of comparative connectives are required.  **Oracy:** Students are regularly given the opportunity to practice their scientific vocabulary in class discussion, through choral response and in giving instruction to others during practical activities. |
| **Becoming future ready** | **Careers/Employability:** Opportunity for development of communication, teamwork, and manual dexterity in the completion of practical activities (Required Practicals in testing for carbohydrates, proteins and lipids and measuring the effect of pH on amylase activity) |
| **Adaptation** | Throughout this topic, quality first teaching will provide differentiation:  **By product:** Assessments have opportunities for students to achieve all grades, with structured questions and opportunities for development of extended writing for all abilities.  **By resource:** Booklets are differentiated as appropriate, with ‘’Core’ booklets produced in conjunction with class teachers for students who would benefit from additional scaffolding of resources in order to achieve their potential.  **By Intervention**: by providing different levels of supervision and support, including the specific deployment of teaching assistants within lessons.  **By Progressive Questioning:** exploring pupils’ understanding through interactive dialogue.  **By Grouping:** according to prior attainment, gender, social preference.  **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:  2.1.1.a I can describe the levels of organisation within living organisms.  2.2.1.a I can describe basic features of enzymes.  2.2.1.b I can describe the lock and key theory as a model of enzyme action.  2.2.1.c I can explain the effect of temperature and pH on enzymes.  2.2.1.d I can describe the digestive enzymes, including their names, sites of production and actions.  2.2.1.e I can describe how the products of digestion are used.  2.2.1.f I can describe the features and functions of bile.  1.3.1.e I can explain how the effectiveness of an exchange surface can be increased, including examples of exchange surface adaptations.  RP.4 I can use qualitative reagents to test for a range of carbohydrates, lipids, and proteins.  RP.5 I can investigate the effect of pH on the rate of reaction of amylase enzyme.  Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | Topic 4 (Heart, Circulation and Respiration), Topic 11 (Hormones and Homeostasis), Topic 12 (Reproduction and Genetic Engineering), Topic 14 (Health Issues) |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |