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| **YEAR \_\_\_\_ 2022-2023 \_\_\_\_\_ TERM: Autumn 1 (Y11)**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Photosynthesis** | |
| **Curriculum Intent** | **In addition to working further on objectives from KS3 Photosynthesis and KS4 Topic 1 Cell Structure & Transport and Topic 9.1 Plant Transport, pupils will be taught, following National Curriculum guidelines, the following in this topic:**   * photosynthesis as the key process for food production and therefore biomass for life * the process of photosynthesis * factors affecting the rate of photosynthesis. |
| **Skills/National Curriculum Links** |
| **Spiritual, moral, social, and cultural development** | **SMSC:** Gardening – greenhouses and food production  **PSHE/British Values:**  Food production, UK farming  **Skills Builder:** |
| **Numeracy** | Calculations required in the topic include rate of photosynthesis, graphical skills including drawing graphs to illustrate the factors that limit the rate of photosynthesis |
| **Literacy** | **Vocabulary Tier 2:** Oxygen, carbon dioxide, glucose, limit, greenhouse, deficiency, agriculture, horticulture, germinate  **Vocabulary Tier 3:** Photosynthesis, limiting factor, auxin, phototropism, gravitropism, gibberellin, ethene,  **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 calculation of the rate of photosynthesis & (Bio only) the effect of light on seedling growth) |
| **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:  2.3.1.b I can explain how the structure of plant tissues are related to their function within the leaf, which is a plant organ  4.1.1.a I can describe what happens in photosynthesis, including using a word equation  4.1.1.b I can describe photosynthesis using a chemical equation  4.1.2.a I can state the limiting factors of photosynthesis  4.1.2.b I can explain how limiting factors affect the rate of photosynthesis, including graphical interpretation (limited to one factor)  4.1.2.c I can explain how the limiting factors of photosynthesis interact, including graphical interpretation involving two or three factors  4.1.2.d I can explain how limiting factors are important to the economics of greenhouses, including data interpretation  4.1.2.e (Higher) I can explain and use inverse proportion in the context of photosynthesis  4.1.3.a I can describe how the glucose produced in photosynthesis is used by plants  RP 6 I can investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed  *3.3.1.c (Biology only) I can give examples of plant ion deficiencies and their effects*  *3.3.2.a (Biology only) I can describe physical, chemical, and mechanical defence responses of plants*  *5.4.1.a (Biology only) I can describe hormone-linked plant responses, to include phototropism and gravitropism, and the role of auxin in controlling these*  *5.4.1.b (Biology only) I can describe the functions of gibberellins and ethene in plants, and the uses of plant hormones in agriculture, horticulture, and the food industry*  *RP 8 (Biology only) I can investigate the effect of light or gravity on the growth of newly germinated seedlings*  Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | Topic 13 Classification and Evolution |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |