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| **YEAR \_\_\_\_ 2023-2024 \_\_\_\_\_ TERM: Autumn 2**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Environment** | |
| **Curriculum Intent** | **In addition to working further on objectives from KS3 Variation and Interdependence & Wonders of the Natural World, pupils will be taught, following National Curriculum guidelines, the following in this topic:**   * Living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways. * Living organisms are interdependent and show adaptations to their environment * Life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen * levels of organisation within an ecosystem * some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community * how materials cycle through abiotic and biotic components of ecosystems * the role of microorganisms (decomposers) in the cycling of materials through an ecosystem * organisms are interdependent and are adapted to their environment * positive and negative human interactions with ecosystems |
| **Skills/National Curriculum Links** |
| **Spiritual, moral, social, and cultural development** | **SMSC:** Care for the environment, understanding of human impact on the environment, ecological communities and interdependence  **PSHE/British Values:**  Care for the environment, understanding of human impact on the environment  **Skills Builder:** |
| **Numeracy** | Interpretation of predator-prey graphs.  Calculations required in the topic include percentage efficiency of energy transfer through an ecosystem (Bio only). |
| **Literacy** | **Vocabulary Tier 2:** stable, competition, distribution  **Vocabulary Tier 3:** community, ecosystem, biotic, abiotic, population, interdependence, extremophile, biomass, producer, consumer, predator, prey, herbivore, carnivore  **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. |
| **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:  7.1.1.a I can state what an ecosystem is, including different levels of organisation in ecosystems  7.1.1.b I can describe which resources animals and plants compete for, and why they do this  7.1.1.c I can explain the terms 'interdependence' and 'stable community'  7.1.2.a I can name some abiotic and biotic factors that affect communities  7.1.2.b I can explain how a change in an abiotic or biotic factor might affect a community given appropriate data or context  7.1.4.a I can describe structural, behavioural and functional adaptations of organisms  7.2.1.a I can represent the feeding relationships within a community using a food chain, including the use of scientific terms to describe these relationships  7.2.1.b I can explain how and why ecologists use quadrats and transects  7.2.1.c I can understand and interpret predator-prey cycles  7.2.2.a I can describe the processes involved in the carbon cycle  7.2.2.b I can describe the processes involved in the water cycle  7.4.1.a I can describe the different trophic levels and use numbers to represent them  7.4.1.b I can describe what decomposers are and what they do  *7.2.3.a (Biology only) I can explain how temperature, water and availability of oxygen affect the rate of decay of biological material*  *7.2.3.b (Biology only) I can explain how the conditions for decay are optimised by farmers and gardeners, and the reasons for this*  *7.2.3.c (Biology only) I can describe how methane gas can be produced for use as a fuel*  *7.2.4.a (Biology only) I can explain how environmental changes can affect the distribution of species in an ecosystem*  *7.4.2.a (Biology only) I can construct a pyramid of biomass and explain what it represents*  *7.4.3.a (Biology only) I can state how much energy producers absorb from the Sun*  *7.4.3.b (Biology only) I can explain how biomass is lost between trophic levels, including the consequences of this*  *7.4.3.c (Biology only) I can calculate the efficiency of biomass transfers between trophic levels by percentages or fractions of mass, and explain how this affects the number of organisms at each trophic level*  *7.5.1.a (Biology only) I can explain the term 'food security' and factors that affect it*  *7.5.2.a (Biology only) I can explain how the efficiency of food production can be improved*  *7.5.3.a (Biology only) I can explain the importance of maintaining fish stocks at a level where breeding continues*  *7.5.3.b (Biology only) I can explain some methods that can help to conserve fish stocks*  *RP 10 (Biology only) I can investigate the effect of a factor on the rate of decay of fresh milk by measuring pH change*  Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | Topic 8 (Biodiversity), Topic 9 (Plants & Photosynthesis) |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |