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| **YEAR \_\_\_\_ 2023-2024 \_\_\_\_\_ TERM: Autumn 1**  **‘An ambitious curriculum that meets the needs of all’**  **Medium Term Planning - Topic: Cell Structure & Transport** | |
| **Curriculum Intent** | **In addition to working further on objectives from KS3 Cells (Year 7), 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 * the need for transport systems in multicellular organisms, including plants |
| **Skills/National Curriculum Links** |
| **Spiritual, moral, social, and cultural development** | **SMSC:** Microscopy 🡪 leading to knowledge of human body, diseases  **PSHE/British Values:** Teamwork, respect for others’ ideas.  **Skills Builder:** Manipulation of equipment |
| **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:** specialised, exchange, adaptation, focus, gradient, permeable  **Vocabulary Tier 3:** eukaryotic, prokaryotic, nucleus, ribosome, cytoplasm, cell membrane, cell wall, vacuole, mitochondria, chloroplast, flagella, magnification, resolution, objective lens, diffusion, active transport, osmosis  **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 microscopy and exchange) |
| **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:  1.1.1.a I can use the terms 'eukaryotic' and 'prokaryotic' to describe types of cells.  1.1.1.b I can describe the features of bacterial (prokaryotic) cells.  1.1.1.c I can demonstrate an understanding of the scale and size of cells and be able to make order of magnitude calculations, including the use of standard form.  1.1.2.a I can state the structures found in animal and plant (eukaryotic) cells.  1.1.2.b I can describe the functions of the structures in animal and plant (eukaryotic) cells.  1.1.4.b I can describe what a specialised cell is, including examples.  1.1.5.a I can define the terms magnification and resolution.  1.1.5.b I can compare electron and light microscopes in terms of their magnification and resolution, including the consequences of these differences for studying cells.  1.1.5.c I can carry out calculations involving magnification, real size and image size using the formula: magnification = size of image / size of real object, expressing answers in standard form if appropriate.  1.3.1.a I can describe the process of diffusion, including examples.  1.3.1.b I can explain how diffusion is affected by different factors.  1.3.1.c I can explain the term “surface area to volume ratio” and how this relates to single-celled and multicellular organisms.  1.3.1.d I can calculate and compare surface area to volume ratio.  1.3.1.e I can explain how effectiveness of an exchange surface can be increased, including examples of exchange surface adaptations.  1.3.2.a I can describe the process of osmosis  1.3.3.a I can describe the process of active transport, including examples  1.3.3.b I can explain the differences between diffusion, osmosis, and active transport.  RP.1 I can use a light microscope to observe, draw and label a selection of plant and animal cells.  RP.3 I can investigate the effect of salt or sugar solutions on plant tissue.  Red denotes interleaving; aspects of knowledge covered previously. |
| **Learning Outcomes (Knowledge)** |
| **Current learning to be developed in the future within:** | Topics: 2 (Enzymes and Digestion), Topic 4 (Heart, Circulation and Respiration), Topic 5 (DNA & Inheritance), Topic 6 (Cell Division), Topic 7 (Immunology and Disease), Topic 9 (Plants and Photosynthesis), Topic 10 (Nervous System), Topic 12 (Reproduction and Genetic Engineering) |
| **Assessment** | Refer to assessment maps for formative and summative assessment opportunities. |
| **Impact** | Attainment and Progress – Refer to assessment results / data review documentation. |