GES Year 12 Half Termly 2 Topic sheet for January - March 2020

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| TOPIC: Cell Structure, Reproduction and Development |

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| Theme: To further explore life processes  | Level: Year 12 |
| Objectives: To further develop an understanding of the scientific concepts in life processes. |

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| Focussing Questions | Key Words |
| 1. **Observing Cells**
2. Describe how living organisms are made of cells, sharing some common features
3. Describe how magnification and resolution can be achieved using light and electron microscopy
4. Explain the importance of staining specimens in microscopy
5. **Describe the ultrastructure and function of eukaryotic cells?**
6. List the ultra structure of eukaryotic cells, including the nucleus, ribosome, mitochondria, centrioles, and lysosomes.
7. **Describe the ultrastructre and function of prokaryotic cells?**
8. List the ultrastrucrte of prokaryotic cells, including the cell wayll , capsule, plasmid, flagellum, pili, ribosomes and circular DNA
9. Describe the function of these structures in prokaryotic cells.

. 1. **The Organization of Cells**.
2. Explain how the cells of multicellular organisms are organised into tissues, tissue into organs and organs into organ systems
3. **The cell cycle**
4. Describe the role of the cell cycle in producing genetically identical daughter cells for growth and asexual reproduction
5. Explain the role of mitosis in producing genetically identical daughter cells for growth and asexual reproduction
6. Calculate mitotic idices
7. Explain the role of meiosis in ensuring genetic variation through the production of non-identical gametes, as a consequence of:

√ The independent assortment of chromosomes in metaphase 1√ The crossing over of alleles between chromatids in prophase 11. **Gametes: Structure and Function**
2. Explain the role of meiosis in ensuring genetic variation through the production of non-dentical gametes
3. Explain how mammalian gametes are specialised for their functions
4. Describe the process of fertilisation in mammals
5. Describe the process of fertilisation in flowering plants.
6. **Cell Differentiation**
7. Explain linkage of genes on a chromosome
8. Explain how cells become specialised through differential gene expression, producing active mRNA leading to the synthesis of proteins which in turn control cell processes or determine cell structure in animals and plants
9. Explain how some phenotypes are affected by multiple alleles for the same gene, or by polygenic inheritance.
10. **Interaction between genes and the environment**
11. Explain how phenotype is the result of an interaction between genotype and the environment
12. Describe how some phenotypes are affected by multiple alleles for the same gene, or by a polygenic inheritance, as well as the environment, and how polygenic inheritance can give rise to phenotypes that show continuous variation.
13. **Stem Cells**
14. Explain what is meant by the terms stem cell, pluripotent and totipotent, morula and blastocyst
15. discuss the ways in which society uses scientific knowledge to make decisions about the use of stem cells in medical therapies
 | CellNucleusCytoplasmCell membraneCell wallChloroplastPermanent vacuoleMitochondriaBacteriaFungiDifferentiationDiffusionConcentration gradientMulticellularTissueOrganOrgan system | **Explaining words**These are examples of….There is a relationship between…….A correlation exists between….To calculate…..In order to…..The equations states….This is caused by….However….…because…This explains….. |

**Resources: departmental textbooks and worksheets/exam board resources**