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**Knowledge Rich Curriculum Plan**

SCIENCE- Changes in an organism’s life

| ***Lesson/Learning Sequence***  | ***Intended Knowledge:****Students will know that…* | ***Prior Knowledge:****In order to know this, students need to already know that…* | ***Working Scientifically*** | ***Tiered Vocabulary and Reading Activity*** | ***Assessment***  | ***Support*** |
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| ***1) Retrieval of cells*** | *Students will know that the nucleus contains DNA, the cytoplasm is a jelly substance where chemical reaction occur, cell membrane control what goes into and out of the cell, mitochondria release energy in a process called respiration, the ribosomes are where proteins are made, the cell wall is made of cellulose and gives the cell strength, the vacuole stores sap and the chloroplasts contain a green pigment called chlorophyll which absorbs sunlight.**Students will define the following: Respiration is a chemical reaction what happens in cells to release energy. Cellulose is a sugar and this is what the cell wall is made from. A pigment is a coloured substance (in the case of chlorophyll this is green)* | *Students will recall that living organisms are made of cells. Students will recall that plant cells consist of a nucleus, cell membrane, cytoplasm, mitochondria, ribosomes, a cell wall, vacuole and chloroplasts. Students will know how to label these parts on a diagram**Students will know that the nucleus contains DNA, the cytoplasm is a jelly substance where chemical reaction occur, cell membrane control what goes into and out of the cell, mitochondria release energy in a process called respiration, the ribosomes are where proteins are made, the cell wall is made of cellulose and gives the cell strength, the vacuole stores sap and the chloroplasts contain a green pigment called chlorophyll which absorbs sunlight.* | *Analysis: comparison of components within different groups of cells.* | *Nucleus- Carries genetic information and controls what happens inside the cell**Organelle-  a subcellular structure that has one or more specific jobs to perform in the cell**Genetic material-The genetic material is in the nucleus of a cell and is composed of a chemical called DNA* | *Retrieval questions**Simple exam questions**End of topic test* *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zyhrng8/revision/1*](https://www.bbc.co.uk/bitesize/guides/zyhrng8/revision/1) |
| ***2) Growth of multicellular organisms*** | *Students will learn that unicellular organisms are living organisms made up of only one cell- Examples include- Bacteria, algae, amoeba. Students will learn that animals and plants are multicellular organisms as they are made of many different cells. Students will learn that cells are the tiny building blocks, tissues are a group of cells, organs are a group of tissues and organs form organ systems.*  | *Students will recall that animal and plant cells have differences between them. A plant cell has the same parts as an animal cell but in addition, plant cells have a cell wall, vacuole and chloroplasts.* | *Communicate: articulate the connection between T3 vocabulary (cell, organ, organism) and multicellular.* | *Growth- the process of increasing in size**Organelle- Part of a cell**Unicellular- are made up of only one cell that carries out all of the functions needed by the organism**Multicellular- are organisms that consist of more than one cell* | *Retrieval questions**Simple exam questions**End of topic test* *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/zprxsbk/revision/1*](https://www.bbc.co.uk/bitesize/guides/zprxsbk/revision/1) |
| ***3) Cell division*** | *Students will distinguish between ‘getting bigger’ (an increase in size) and growth (an increase in the number of cells) in multicellular organisms.**Students will define the following: cell division is the series of events that take place in a cell that cause it to divide into two daughter cells, genome as a copy of all your chromosomes. cells enlarge and then divide to replace damaged cells and to make new ones for growth of an organism.**During the cell cycle, division takes a short period of time and the greater period of time is dedicated to DNA replication.* | *Students will recall that organelles are a sub cellular structure that has one or more specific jobs to perform in the cell; that growth is the increase in size due to increased numbers of cells.* | *Communicate: construct explanations that involve appropriate T3 vocabulary* | *Cell division- The series of events that take place in a cell that cause it to divide into two daughter cells**Constantly- continuously over a period of time; always.* | *Retrieval questions**Simple exam questions**End of topic test* *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/guides/z6gr92p/revision/1*](https://www.bbc.co.uk/bitesize/guides/z6gr92p/revision/1) |
| ***4) Life cycles of plants and animals*** | *Students will recall that organisms are alive during all stages of a life cycle and describe the life cycles of different plants and animals (e.g. a flowering plant, a human and a butterfly).* | *Characteristics of living things are MRS GREN**Move, reproduce, sense, grow, reproduce, excrete and nutrition.**Life cycles from KS2: frog spawn, tadpole, frog. Egg, caterpillar, chrysalis and butterfly, seed, seedling, plant; acorn, sapling, tree. In particular that the adult will start the cycle over when reproduction occurs.* | *Analysis of information to identify similarities and differences between organisms and their life cycles.* | *Dormancy-the state of having normal physical functions suspended or slowed down for a period of time**Germinate- begin to grow and put out shoots after a period of dormancy**Embryo- an unborn offspring in the process of development human offspring 2-8 weeks after fertilization* | *Retrieval questions**Simple exam questions**End of topic test* *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)*[*https://www.bbc.co.uk/bitesize/topics/zdqdcqt/articles/zyv3jty*](https://www.bbc.co.uk/bitesize/topics/zdqdcqt/articles/zyv3jty) |
| ***5) Roles and importance of structures involved in life-cycle development*** | *Students will apply the idea that growth by cell division is an important part of the life cycle of multicellular plants and animals. Describe the role and importance of development in the life cycles of plants and animals (e.g. flowering plants producing flowers, butterflies undergoing metamorphosis and humans going through puberty). Explain the role of gametes (sex cells) in the life cycles of plants and animals.* | *Recall of sexual characteristics of female and male.**Recall of terms multicellular, organism, life cycle.*  | *Analyse: look for patterns in life cycles that are common changes.*  | *Gamete-a mature haploid male or female germ cell which is able to unite with another of the opposite sex in sexual reproduction to form a zygote* | *Retrieval questions**Simple exam questions**End of topic test* *Summative assessment 1* | *Knowledge organiser (provided on Teams and in class)**https://www.bbc.co.uk/bitesize/articles/zj67wnb* |