**Year 9 Autumn 1 SoW and homework plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Chapter and Topic** | **Lesson** | **Outcomes** | **Suggested activities/resources** | **Homework** |
| B1 Cell structure and transport | Animal and plant cells | * Label and animal cell and plant cell * Compare the structure and function of animal and plant cells * Challenge: **Analyse** sizes of cells using units of length | 1. Give each student the cells with one part labelled, students trade information (without showing each other their sheet) to complete the labelling. 2. Facts with the functions of the parts of the cells, students match up the organelle with the function   Suggested song: <https://www.youtube.com/watch?v=-zafJKbMPA8>  Extension task  An average animal cell is about 15 μm long.   1. How many cells would you need to put in a line to make up a metre? 1 cm = 10,000 μm 2. Which do you think is bigger, a nucleus or a mitochondria? Why? One is about 10 μm, the other is 1-2 μm. 3. A plant cell can be up to 100 μm, what is the minimum number of plant cells you would need to line up to make a metre?   Homework: Learn the structure of the cells and the functions of the organelles. | **Embed**  Learn the structure of the cells and the functions of the organelles. |
| 2 | *Possible lesson: Making models of the plant and animal cells* | * Name the main parts of cells (Grade 2) * Compare plant and animal cells (Grade 4) * Evaluate the usefulness and accuracy of the models (Grade 6) | 1. Test on labelling the cells 2. Model making from jelly and sweets – see shared area for resources 3. Test on functions |  |
| 3 | Microscopes | * Compare the 2 types of microscope * Describe the difference in magnification and resolution of the different microscopes * Explain how to calculate the magnification, real size and image size of a specimen | Onion skin practical |  |
| 4 | Eukaryotic and prokaryotic cells | * Describe the similarities between prokaryotic and eukaryotic cells * Describe functions of plasmids and flagella * Calculate the size and scale of cells including order of magnitude | 1. Discussion on how a prokaryotic cell differs from a eukaryotic cell using diagrams as stimulus 2. Label a prokaryotic cell with names and functions   Eukaryotic cell and prokaryotic cell point questions (shared drive)  Orders of magnitude questions (extension sheet on shared drive)  Homework: Prokaryotes and eukaryotes quiz on kerboodle | Prokaryotes and eukaryotes quiz on kerboodle |
| 5 | Specialised animal cells | * Describe how cells differentiate to form specialised cells * Describe some specialised animal cells * Explain how the structure of different animal cells relates to its function | Market place activity on muscle cells, sperm cells, nerve cells |  |
| 6 | Specialised plant cells | * Describe some specialised plant cells * Explain how the structure of different plant cells relates to its function | Market place activity or presentations  Homework: Make a model cell (criteria on shared drive) | Apply:  Make a model cells following the success criteria |
|  | Mid topic assessment |  |  |  |
| 7 | Diffusion | * Define diffusion * Describe the factors that affect the rate of diffusion * Link diffusion with biological processes | How can sharks find injured prey so quickly?   1. Perfume spray 2. Diffusion of tea in different sized beakers/hot and cold water 3. Application of diffusion in small intestine to include structure of villi |  |
| 8 | Osmosis | * To define and compare diffusion and osmosis * To predict what happens to plant and animal cells when placed in different solutions * To evaluate why plant and animal cells behave differently. | 1. Place piece of potato in salty water and pure water. Compare ‘floppiness’ after 2. Define diffusion, osmosis, partially permeable membrane 3. **Higher only:** hypertonic, hypotonic and isotonic solutions. Give diagrams and get students to describe the movement of water 4. Compare animal and plant cells in each solution. Can model the action of a cell wall by blowing up a balloon in a cardboard box. |  |
| 9 | Osmosis required practical | * Set up an investigation to show osmosis in different concentrations of sugar solution (Ribena) * Analyse results through drawing a graph and identifying isotonic concentration. |  | **Challenge**  Draw a graph of the results of the osmosis experiment and identify the isotonic concentration. |
| 10 | Active transport | * Describe how active transport works * Explain the importance of active transport in cells * Analyse the similarities and differences between active transport, diffusion and osmosis | Acting out of the process:   * Row of people to make up the cell membrane * One person to be the protein molecule * People to be the molecules (6 inside the cell, 2 outside) * One person to be the energy supplier   Examples of active transport e.g. glucose absorption in the small intestine, absorption of mineral ions from the soil into the root hair cell  Summary table of diffusion, osmosis and active transport |  |
| 11 | SA:vol | * Calculate surface area * Calculate volume * Compare surface area:volume ratio of different sized object * Apply the idea of surface area:volume ratio to whether diffusion will be fast enough to transport materials in animals of different sizes | 1. Maths calculations of SA:vol. Use cubes from maths 2. Practical: diffusion of hydrochloric acid into agar cubes 3. Demonstration of the lungs to show why there are alveoli to increase surface area | **Independent work:**  Explain how the lungs are adapted for efficient gas exchange. |
|  | B1 test? |  |  |  |