Curriculum Sequencing - Year 9

<table>
<tr><th colspan="4">Year 9: Cells (including Triple)</th></tr>
<tr><td colspan="2">Topics covered:
Cell Structure
Microscopy
Cell differentiation and specialisation
Chromosomes
Mitosis
Binary Fission
Culturing Microorganisms
Stem Cells
Diffusion, Osmosis and Active Transport
Exchange surfaces and substances</td><td>How it links to what has been studied before:

You will have learnt about cell structures in yr. 7 and about the difference between plant and animal cells, how cells can become specialised and been introduced to using a microscope.</td><td>How it links to what will be studied:

In Bioenergetics you will use what you have learnt to further understand respiration and photosynthesis.

In Inheritance you will compare mitosis and meiosis, what happens in the ribosomes and what chromosomes are used for.</td></tr>
<tr><td colspan="2">Key words:
Prokaryotic, Eukaryotic, magnification, resolution, nucleus, Chromosomes, mitosis, control, inhibition, therapeutic cloning, diffusion, osmosis, concentration, Active transport, surface area to volume ratio.</td><td colspan="2">Key skills:
Working scientifically:
- Setting up slides
- Aseptic techniques
- Evaluating ethical issues in Stem cell research
- Identifying variables in RPAs
Maths Skills:
- Estimating size and area of cells
- Estimating cell cycle length
- Calculating rate of diffusion
- Osmosis concentration graphs
- Calculating area and volume</td></tr>
<tr><td colspan="2">Assessment focus
Microscopy RPA
Osmosis RPA
Culturing microorganisms - Triple
End of topic test
Formative assessment</td><td colspan="2">Revision tips
- Learn the microscopy equation
- This topic contains lots of comparisons, make sure you can compare different types of cells and different ways to transfer substances.</td></tr>
<tr><td colspan="4">Why we study it:
Cells are the building blocks of life, from single celled organisms, to humans who are made up of 37 trillion cells, we need to understand how each part of a cell works to be able to understand all of life's processes.</td></tr>
<tr><td colspan="4">Mastery in this subject
To Master this topic, you need to be able to explain how stem cells can be used in therapeutic cloning and how different substances can be exchanged via different tissues and how these tissues are adapted to allow for optimum exchange rates.</td></tr>
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Energy 1. Energy Types and Resources:

Topics covered:	How it links to what you have studied before:	How it links to what you will study:
Energy stores **Conservation of Energy** **Energy types** **Efficiency** **Energy and Power** **Non-Renewable Energy** **Renewable Energy** **Pros and Cons of Energy sources** **Generating Electricity and National Grid**	**KS2: Energy types and stores. What objects these might be found in.** **KS3. Energy stores, transfers, calculating energy and converting to kilowatts. Conservation of energy. This has been taught at a lesser depth but is part of the spiral curriculum. These lessons sit alongside the ks3 national curriculum.**	**It will link in with the second energy topic later on in the year and discuss the movement of energy mathematically and at a particle level. This topic has been split into two, this one the first one, to lay the foundations for the second part of the energy topic (energy 2)**

Key words:	Key skills:
Energy stores **Conservation of Energy** **Energy types** **Efficiency** **Energy and Power** **Non-Renewable Energy** **Renewable Energy** **Kinetic** **Gravitational energy** **Chemical Energy** **Mechanical energy** **Heat energy** **percentage**	**Discussion and oracy skills when reflecting on the pros and cons.** **Practical skills and investigation work. Measuring current and using multimeters, linking this to real world issues.** **Literacy and written skills. Using keywords and written comparisons, with the aim getting students to do this fluently.**

Assessment focus	Revision tips.
End of unit test	**Use a checklist to guide what aspects student know and don't know - then to focus on areas they do not know.** Exam questions, revision guide and BBC Bitesize.

Why we study it:
Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce our energy usage.

Mastery in this subject

To master this topic you will need to explain and compare the use of renewable energy types fluently and logically. You should be able to mathematically compare the efficiency of the use of energy and discuss ways that transporting energy to consumers has been made more efficient.