

**Where this unit fits in****This unit builds on:**

unit 58 the concepts that living things have processes in common, and that plants and animals have structures with specific functions (3B, 5B, 1A, 4A, 5A).

The concepts in this unit are:

cells. Pupils are introduced to the concept of cells as the basic unit of life.

This unit leads onto:

units 7B Reproduction, 8B Respiration and 9C Microbes and Disease.

Prior learning

To make good progress, pupils starting this unit need to understand:

- how to recognise living things and distinguish them from things that are not living
- that plants and animals are made up of structures, e.g. muscles and roots, that fulfil specific functions.
- the functions of a flower (reproduction).

Framework yearly teaching objectives – Cells

- Describe a simple model for cells that recognises those features all cells have in common and the differences between animal and plant cells.
- Explain that some living organisms are only one cell but that others are multicelled.
- Explain that growth means an increase in the size and number of cells.
- Explain that similar specialised cells can be grouped together to form tissues, that tissues can form organs, and that these do not all develop and grow at the same time; use this to explain why and how some organisms care for and protect their offspring.

Expectations from the QCA Scheme of Work

At the end of this unit ...

... most pupils will ...	... some pupils will not have made so much progress and will ...	... some pupils will have progressed further and will ...
In terms of scientific enquiry NC Programme of Study Sc1 1c; 2a, c, d, e, h, j, k, o		
• describe some earlier ideas about the structure of living things and relate these to evidence from microscopic observations • make observations using a microscope and record them in simple drawings • suggest a question about pollen tubes that can be investigated and use an appropriate sample • present results in an appropriate graph and explain what these show.	• relate drawings to observations made using a microscope and describe what they found out during their investigation.	• explain how evidence from microscope observations changed ideas about the structure of living things • estimate sizes of specimens viewed under the microscope and justify the sample chosen in an investigation of pollen tubes.
In terms of life processes and living things NC Programme of Study Sc2 1a, b, c, d, e		
• identify and name features of cells and describe some differences between plant and animal cells • explain that growth occurs when cells divide and increase in size • describe how cells are grouped to form tissues.	• recognise that all organisms are made from cells • name some parts of a cell.	• recognise that viruses are not cells • describe how some cells in an organism are specialised to carry out particular functions.

Suggested lesson allocation (see individual lesson planning guides)

Direct route →					
A1 Organs, cells, tissues	A2 Building blocks	A3 Cells and growth	A4 Scaling up and down: Think about scales	A5 Flower cells	
Extra lessons (not in pupil book)					
A1 Organs, cells, tissues. Extra lesson may be needed depending on choice of main activities.	A2 Building blocks. Extra lesson may be needed depending on choice of main activities.			A5 Investigate: What makes pollen tubes grow?	Review and assess progress (distributed appropriately)

Misconceptions

Pupils often do not relate the 2D diagrams to a 3D shape, so work with models is essential. They think of cells as unmoving and unchanging, which does not help them understand that cells are the basic unit of life. They often think that bacteria and yeast are not cells. They often think that plant cells do not have a cell membrane, because of the presence of the cell wall.

Additional information

Some schools have experienced difficulties with the pollen tube investigation suggested in the QCA Scheme. Activity A5c has therefore been designated as a planning investigation activity. There will be other opportunities in the course to discuss sampling.

Health and safety (see activity notes for further risk assessment)

Microscopes should not be used with sunlight as the light source. Pupils should wash their hands after handling any biological material.

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