

Strengthening teaching and learning of cells in Key Stage 3 science

Through attending this training, you will be better prepared to teach the key idea of cells as described in the yearly teaching objectives. You will have examined cell theory and undertaken practical activities at an appropriate level for Key Stage 3 pupils.

Progression in the teaching of cells can be mapped out using the yearly teaching objectives to provide the following learning experiences for pupils during this stage.

Cells and systems

Pupils need to be aware of basic cell structure in order to understand the way in which cells work together to perform specific functions.

They need to be able to use a microscope and identify animal and plant cells.

They should learn about how cells have become specialised and how these specialisms allow the cell to function efficiently.

Pupils need to realise that, while cells do grow a little, the growth of an organism is due to the multiplication of individual cells.

The role of cells in digestion, enzyme reactions and circulation

Pupils should understand the role that specialised cells play in the digestion of food.

They should also be able to describe the role of enzymes in breaking down food substances into smaller molecules, which can be used by individual cells.

Pupils should be given the opportunity to investigate the role of enzymes in the breakdown of a given food substance.

Pupils should be encouraged to think about the circulatory system supplying each individual cell with everything it needs to function effectively.

Respiration, photosynthesis and reproduction

Pupils should be able to describe breathing as a mechanical process and to distinguish this from respiration, which is a biochemical process.

They should be able to describe photosynthesis and respiration, and to distinguish between the two using word equations.

They should be able to explain fertilisation as the process by which genes from one parent combine with genes from the other, and how this causes variation within a species.

Progression in teaching about cells

Progression in teaching the key ideas about cells is fundamental to pupils' understanding.

Progression can be mapped out using the yearly teaching objectives, and suitable learning experiences for pupils planned from this mapping.

Implications for the science (biology) department

You should:

- Use a departmental meeting to share the main messages from the unit.
- Use the sorting cards (session 5) to promote discussion about progression when teaching the key idea of cells.
- Agree a departmental approach to teaching the key idea of cells and then match this to current schemes of work. If there is a mismatch, the department should agree how the scheme of work should be altered to incorporate progression in the key idea of cells.

Implications for individual teachers

You should:

- Look at the glossaries that were produced during the training and identify any areas that you do not feel confident about. Ask biology teachers in your school or your consultant to spend some time discussing these with you.
- Look at the cards that you placed in the ? envelope. Ask a biologist in your school or your consultant to provide some follow-up work for you to increase your confidence in teaching these aspects.
- Ask your consultant to plan and team-teach a cells topic with you that you do not feel confident about.
- Use the websites listed on handout 5.7 to find answers to outstanding questions and to locate other resources.