

Planning and managing progression in science

Main messages from the unit

- Progression must be clearly mapped in the scheme of work.
- All teachers in the department do not need to follow exactly the same order for teaching units of work, but for any key idea the sequence of teaching units must emphasise and develop progression. *For example, some teachers could begin Year 7 with units of work on cells and living organisms, others on particles and materials, and others on balanced and unbalanced forces, etc.* What is important is that every class is taught, and learns, less demanding work before meeting that which is more demanding.
- Progression in science includes progression in knowledge and understanding, in the skills and processes of scientific enquiry, in literacy, numeracy and thinking skills.
- The Framework and in particular the yearly teaching objectives offer support and guidance in planning for progression
- Progression in the key scientific ideas involves introducing the idea early and then building pupils' knowledge and understanding so that they can:
 - accurately use scientific vocabulary and conventions to describe, generalise and explain;
 - use the key scientific ideas to explain phenomena, events and processes;
 - use models to explain abstract science ideas in familiar contexts;
 - apply ideas and models to provide scientific explanations in less familiar contexts;
 - link scientific ideas together to explain and make predictions;
 - use quantitative relationships.
- Planning for progression in scientific enquiry requires the department to consider how to turn the programme of study into objectives for lessons or groups of lessons which can then be mapped into the scheme of work over the full key stage.
- It is important to plan for the teaching of scientific enquiry because this:
 - ensures full coverage of the National Curriculum;
 - supports progression in teaching and hence learning;
 - enables teachers to avoid the stress of trying to do every element of Sc1 each time an enquiry or investigation is attempted;
 - enables teachers to manage pupils' learning by focusing on manageable elements of Sc1 in any one lesson;
 - supports assessment for learning because teachers can focus on one element of Sc1 at a time;
 - enables strengths and weaknesses in elements of Sc1 to be identified;
 - allows a little more opportunity to enjoy enquiry and investigative work.

- Within teaching units, individual teachers should be able to plan their own sequence of progressive lessons. There is no single route to teaching for progression; alternative routes may be more meaningful to different teachers and children. Schemes of work should allow this flexibility.
- Before teaching a unit of work teachers should consider the following questions:
 - What are the main scientific ideas and skills to be taught in the unit?
 - How do these link to previous, related work?
 - Is there an essential sequence for these ideas which must be followed?
 - Which aspects of the work can be sequenced by individual teachers?
 - At what point should pupils' progress be reviewed?
 - What steps will need to be taken with those pupils who fail fully or adequately to grasp the main ideas?

Implications for the department

The priority which the department has accorded to reviewing planning and managing progression will be reflected in the action points identified for the department action plan. It is likely that some review of progression will be needed. A number of actions which could be taken are listed below as an aide-memoire.

For the department

Collectively use the card sort activities to review understanding of progression in some or all of the five key ideas.

Review the sequencing over the key stage of topics in the scheme of work.

Add supplementary materials to existing scheme of work to support progression in the five key ideas.

Redraft one or more topics in the scheme of work.

Complete the outline plan for teaching Sc1.

Review the scheme of work for progression in Sc1.

Identify existing practical work which could be used to support teaching of Sc1.

Add supplementary materials or a timeline to identify progression in Sc1 more clearly.

Consider how yearly objectives can be used to help identify progression.

For individual teachers

Review your own knowledge, understanding and confidence in teaching all of the programme of study.

Arrange for support from specialist colleagues (biology, chemistry, physics) for any aspects you feel less confident about.

Consider attending the optional unit on planning and implementing progression in the classroom.