Strengthening mathematics teaching and learning in Year 7: key messages

This leaflet is for mathematics teachers who were unable to attend the national training. It summarises the main points and is best used in conjunction with the notes for departmental meetings.

The Year 7 course has two parts: *Including all pupils in mathematics* and *Approaches to written calculation*.

The teacher who attended the course will have received a school pack (ref: DfES 0424/2002), which contains a range of supporting materials for use in schools:

- notes for departmental meetings;
- two course handbooks, one for each part of the training;
- a video.

The notes for departmental meetings and the course handbooks, as well as other Key Stage 3 National Strategy materials, can be found on the website at www.standards.dfes.gov.uk/keystage3

Including all pupils in mathematics

The first part of the course considers:

- planning the curriculum for pupils working below level 3;
- implementing and adapting Springboard 7.

The National Curriculum sets out three principles that are essential to developing a more inclusive curriculum:

A Setting suitable learning challenges

B Responding to pupils' diverse needs

C Overcoming potential barriers to learning and assessment for individuals and groups of pupils

Planning for pupils working below level 3: key messages

- The Year 7 mathematics curriculum should provide all pupils with an appropriate amount of challenge while also meeting the diverse needs of individuals and groups.
- Pupils working below level 3 should have access to the full breadth of the Year 7 mathematics curriculum with their particular needs being catered for by carefully differentiated planning and teaching.

Ref: DfES 0091/2003

Planning for inclusion

The training provides an opportunity to consider learning objectives appropriate for pupils working below level 3.

- Some objectives in the Year 7 programme of study are considered accessible to all pupils.
- Some need to be adapted to provide appropriate access.
- Some are considered too challenging in Year 7.

To support the teaching of an entitlement curriculum, examples of 'Planning to teach' sheets (pages 18–25 of *Course handbook 1*) highlight vital considerations when planning for pupils working below level 3.

- Starting with core objectives, identify related support objectives and objectives for pupils working below level 3. For example:

Below level 3	Support	Core
Recognise and extend number sequences formed by counting from any number in steps of constant size (integers)	Recognise and extend number sequences formed by counting from any number in steps of constant size, extending beyond zero when counting back	Generate and describe simple integer sequences

- Identify key ideas and possible difficulties pupils may have.
- Plan questions and prompts that will help develop pupils' thinking and their understanding.

Implementing and adapting Springboard 7: key messages

- Springboard 7 requires direct teaching. Teachers should identify appropriate teaching objectives based on their assessment of pupils' needs, select activities that match these objectives, and decide on the most appropriate way to use these activities.
- The Springboard 7 materials provide a useful teaching resource but they need to be used flexibly and adapted appropriately if pupils are to benefit fully.
- Well-planned and well-focused support from a teaching assistant can provide valuable help for pupils on a Springboard 7 programme.

The course stresses how Springboard 7 can be used in a range of ways:

- as the basis of direct teaching;
- to support oral and mental work;
- as a stimulus for class discussion;
- as consolidation after a teaching input;
- as an assessment or summary exercise;
- as a homework activity.

Examples in the handbook provide a good focus for discussion.

Ref: DfES 0091/2003

Video sequence 1 Effective classroom support

This sequence shows a teacher and a teaching assistant talking about how they work in the classroom. They highlight the importance of:

- sharing the objectives of the lesson;
- having a clear understanding of how they will work together;
- reflecting on the lesson and the progress made by particular pupils.

Approaches to written calculation

The second part of the course focuses on developing efficient calculation strategies. Implications for teaching and learning calculation strategies are explored through analysing pupils' responses to test questions.

Key messages

- Build on the mental and written methods pupils have been developing in Key Stage 2.
- Teach pupils to be flexible in how they approach multiplication and division problems. It is important that they learn to choose the most appropriate methods of calculation to solve problems.
- In developing efficiency, build on what pupils already know, understand and can do. Written methods rely on an understanding of and competence in a variety of mental methods.
- Written methods should be refined to improve efficiency, while at the same time maintaining understanding.

Teachers attending the course were asked to consider what percentage of pupils they would expect to successfully answer the following question from the 2001 Key Stage 3 national test.

> **'Trip' part (a)**
> A football club is planning a trip.
> The club hires 234 coaches. Each coach holds 52 passengers.
> How many passengers is that altogether?
> Show your working.

Looking at pupils' responses to this and the second part of the question reveals some of the difficulties that pupils experienced – and some inefficient ways of working!

Video sequence 2 Explaining multiplication and division methods

This video sequence shows a group of Year 7 pupils from Stepney Green School, in the London borough of Tower Hamlets, working on the same problem. The sequence highlights the following.

- The pupils are confident in partitioning numbers to help them multiply and divide.
- They are able to recall multiplication and division facts and can multiply mentally by multiples of 10 and 100.
- They understand and are able to use the relationships between the four operations.
- Their written methods build on mental methods of partitioning. For example, they generally start by multiplying the most significant digits.
- They now need to be taught to look for more efficient ways of partitioning and to develop more compact ways of recording.

The session uses the video as a starting point for considering progression in written multiplication and division. Mathematics teachers need to reflect on their current practice, consider the opportunities they provide for developing pupils' calculation strategies, and establish a consistent approach to teaching calculation in the department and across the curriculum.

Ref: DfES 0091/2003