

## Whole school

This section discusses issues connected with Wave 3 provision in the whole school context.

### Leadership and management

There will be a number of decisions to make in connection with Wave 3 provision to suit the school's organisation. Some examples are:

- strategic planning of the coordination of Wave 3 provision;
- responsibility for coordination of Wave 3 provision;
- clarification of roles of the headteacher, deputy head, mathematics coordinator, SENCO, teachers and teaching assistants;
- continuing professional development for staff;
- processes for targeting Wave 3 provision;
- timing of Wave 3 sessions;
- storage and access to Wave 3 materials and resources;
- organisation of children to allow involvement of other children when necessary;
- opportunities for involving parents and carers;
- communication about children's progress and implications for schools' assessment procedures.

During the pilot, schools evolved a variety of solutions. Some of these are described in the case studies.

One Year 3 class teacher in the pilot occasionally replaced the mental/oral starter of her mathematics lessons with a whole-class session in the playground or hall. She used large number cards, etc. for activities based on the Wave 3 mathematics pilot materials.

Often in pilot schools, teaching assistants were given extra training: sometimes in a centrally organised LEA session, sometimes as part of a school-led activity for a group of teaching assistants, sometimes by working with teachers sharing ideas while looking at video clips from *Using models and images to support mathematics teaching and learning in Years 1 to 3*.

In one pilot school, the teacher started the day ten minutes earlier and worked with children just for ten minutes; sometimes working with one child, sometimes involving others.

During the trialling of the materials, several schools gave extra training to teaching assistants so that they could work one-to-one with the child on the Spotlights the teacher selected. (The extra training was given within the school, and sessions with the LEA numeracy consultant were also organised for teaching assistants from several schools.)

Using teaching assistants in this way was often successful, but headteachers, SENCOs, mathematics coordinators and teachers identified the vital need for the teacher to work with the child on the opening teaching activity and final Spotlight in order to assess the progress the child had made and to decide on next steps.

One of the headteachers in a pilot school said that she realised that she needed to be much more involved with what was going on in Wave 3 mathematics. She said that there would need to be some changes to roles as well as the timetable changes the school had already made to accommodate Wave 3 work. She realised that asking two teaching assistants to use the materials to support an NQT had overburdened the teaching assistants, although she was very impressed by what they had achieved.

The headteacher realised that the teacher had lost touch with the children with whom the teaching assistants were working. The headteacher decided to timetable teacher and teaching assistant planning and review sessions during whole-school assemblies each week.

A pilot school replanned its staffing budget, increasing the hours worked by some teaching assistants so they could work in partnership with class teachers on the Wave 3 intervention.

## Inclusion

Understanding the importance of children retaining their entitlement to a daily mathematics lesson, schools in the pilot trialled a wide range of strategies for making time for Wave 3 provision, for example:

- during registration;
- part of lunch time;
- during afternoon teaching sessions;
- during the mental/oral starter;
- during whole-class mathematics group time.

Principles that schools adhered to were flexibility and the intention that Wave 3 provision should be for a short, focused period of time, rather than timetabled week after week for the same child.

The materials have been designed to enable teachers to continue Wave 3 activities within a whole-class context. Suitable activities are indicated at the end of many Spotlights by the icon:



Games are included in many sets of teaching activities. Some pilot schools used these beyond the children targeted for Wave 3 intervention both in school and as support for parents and carers to continue the focused teaching on particular errors/misconceptions. Some of the teaching units contain an additional game, indicated by the icon:



An index of all the games in the teaching materials is provided in the *Resources and index of games* book.

The materials are not linked to specific types of special educational need: they do not, for example, form a programme for dyslexic or dyscalculic children, or children with dyspraxia, Down's syndrome or cerebral palsy. They are intended to have a broad application to children with difficulties in cognition and learning, however those difficulties may have arisen.

In one pilot LEA, the observation was made that children regularly taken on holiday in the first few weeks of September, often make errors relating to place value, because they miss that area of teaching each year. Some of these children might be comparatively high achievers. A pilot school pointed this out to parents, but meanwhile implemented Wave 3 intervention to help the children catch up.

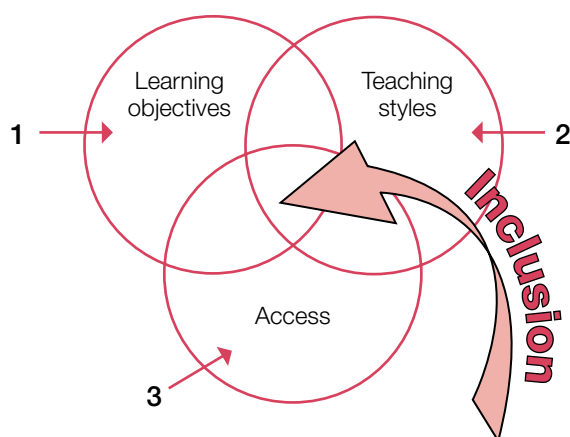
A teacher working with George, aged 9, observed his confusion with place value when working with place value (arrow) cards. She did some diagnostic assessment with him using questions from the tracking chart. Then she selected some spotlights for him to work on with the teaching assistant. The teaching assistant found George 'resistant' to some of the activities but she found a place value game which he played enthusiastically with another child chosen by the teacher. When the teacher came to assess George's progress at the end of two weeks, he could work with the place value cards and said (smiling) 'I really like maths now.' The teacher then decided to focus on George's mental calculation

## Circles of inclusion

The different forms of support which children may need with their mathematical learning are represented on the following diagram.

These circles of inclusion provide a useful model for considering children's needs in the context of Wave 3 mathematics provision. The teaching materials are designed to take into account the three different aspects of inclusion as conveyed in the diagram, with the primary focus on the learning objectives and teaching styles circles.

### The circles of inclusion



- 1 Learning objectives: setting suitable learning challenges enabled by the use of the tracking children's learning charts to support the process of tracking back. Wherever possible, these should be linked to the class topic and focus on the earlier stages in learning of that topic. Some teachers in the pilot chose Wave 3 interventions to act as pre-learning for the targeted children before the topics became part of whole-class learning.
- 2 Teaching styles: implicitly addressing the needs of visual, aural and kinesthetic learners in the presentation of the teaching activities. Additional scaffolding opportunities are presented in the shaded boxes within the text.
- 3 Access: overcoming potential barriers to learning by using practical resources and common real-life contexts, but not attempting to cover comprehensively the range of access strategies which different children will need. The table below sets out some additional access strategies for the more common types of impairment and special educational need for which teachers and teaching assistants may need to plan.

## Access strategies for mathematics

Type of impairment or difficulty	Access strategies
Dyslexia and dyscalculia	<ul style="list-style-type: none"> <li>• Encouragement to use pattern and working from known to unknown to circumvent problems with rote recall of number facts</li> <li>• Aids to recall of basic number facts – own pocket number line, 100 square, number fact chart – to overcome problems in rote recall</li> <li>• Use of calculator when solving problems</li> <li>• Encouragement always to simplify the calculation and relate it to those they can do, so as to use estimation as a check when doing calculations</li> <li>• Use of kinaesthetic and visual support for learning – for example, using bead strings to teach place value and calculation</li> <li>• Colour-coded place value cards to help overcome problems with left-right sequencing</li> <li>• Jottings to note instructions and each of the steps in multi-step problems or mental calculations, to help overcome problems in working memory</li> <li>• Introducing new concepts using numbers the child finds easy to manipulate</li> <li>• Texts read aloud where necessary by a 'buddy'</li> </ul>
Spatial and motor difficulties associated, for example, with dyspraxia or cerebral palsy	<ul style="list-style-type: none"> <li>• Increased use of number line when working with addition and subtraction, rather than counting objects or using fingers; own pocket number line</li> <li>• Teaching child to physically move objects from one side of a ruler to another, or cross them out on the page, when they must be counted</li> <li>• Number squares with alternate rows shaded or coloured to help them keep track of where they are</li> <li>• Small hole punched in top right-hand corner of numeral cards to prevent directional confusions</li> <li>• Use of squared paper for laying out written calculations</li> <li>• Mathematical symbols presented in different colours – for example, always green for +, blue for x – to prevent confusion between symbols where a difference in orientation is all that distinguishes one from another</li> <li>• Use of pre-prepared formats for calculations, graphs and tables</li> <li>• Use of appropriate software for recording calculations, graphs and tables and for drawing/manipulating shapes</li> <li>• Laying rulers or scales along coordinates when plotting or reading them</li> <li>• Teaching the child to put visual or spatial information into verbal form, and vice versa</li> <li>• Using non-slip matting and sticky-tack to anchor resources and paper</li> <li>• Recording using numeral cards or circling numerals on number lines and grids, rather than by writing</li> </ul>
Language and communication difficulties	<ul style="list-style-type: none"> <li>• Breaking down instructions and explanations into 'chunks'</li> <li>• Regular checks for understanding</li> <li>• Visual prompts and cues and the opportunity to manipulate physical resources whilst mental calculation questions are being asked</li> <li>• Jottings to note instructions and each of the steps in multi-step problems or mental calculations, to help overcome problems in working memory</li> <li>• Vocabulary charts and pocket glossaries with mathematical words and their meaning; use of mnemonics to aid recall</li> <li>• All words related to addition presented in one consistent colour.</li> </ul>

'We found the kinaesthetic experiences the best way to get through to them ... We used things they could touch ... We did many activities in the hall on a big scale so that they were using their bodies ... They loved it, especially the games ... I loved seeing the smiles on their faces.'

*A teaching assistant who took responsibility for resources for Wave 3 mathematics interventions in the school*

## School self-evaluation of Wave 3 provision

### Quantitative self-evaluation

Schools may find the following questions helpful in considering the effectiveness of their practice for low-attaining children.

- How does the percentage of our children who achieve below level 3 in mathematics at the end of Key Stage 2 or below level 2 at the end of Key Stage 1 compare with the national averages and the averages for similar schools (FSM and prior attainment)?
- How do we evaluate our children's progress from the beginning to the end of a period of Wave 3 intervention?
- How do we use data to identify those children who could benefit from Wave 3 intervention?
- How does the progress that we achieve for children with low prior attainment compare with that achieved nationally/locally?

### Qualitative self-evaluation

Schools can compare their own Wave 3 provision with a set of quality guidelines derived from research and best practice.

Key activities	Our Wave 3 provision in mathematics:	Comments/actions
Establishing priorities, analysing results and reviewing progress	<ul style="list-style-type: none"> <li>• is informed by clear expectations and the tracking of individual children's progress</li> <li>• involves the diagnostic assessment of children's strengths and weaknesses</li> <li>• incorporates regular review and assessment of progress as an intrinsic part of the provision</li> </ul>	
Continuing to improve the quality of learning and teaching	<ul style="list-style-type: none"> <li>• is taught and overseen by personnel with appropriate skills and expertise to adapt and tailor teaching to the child's identified needs</li> <li>• builds in assessment for learning as a fundamental part of the activity</li> <li>• ensures close connections between the intervention and the teaching of the whole class</li> </ul>	

Leading intervention and managing and deploying resources to meet the needs of all children	<ul style="list-style-type: none"> <li>• is led by members of the school's leadership team who are responsible for strategic planning</li> <li>• is managed by an identified member of staff who oversees the intervention on a day-to-day basis</li> <li>• is part of a coherent whole-school approach to the three waves of intervention</li> <li>• is based on as early an intervention as possible</li> <li>• ensures that a range of age-appropriate interventions are available</li> <li>• ensures that over time the entitlement of all children to a broad and balanced curriculum will be maintained</li> <li>• establishes regular monitoring and evaluation of the impact of Wave 3 mathematics provision</li> </ul>	
Engaging and communicating with children and others	<ul style="list-style-type: none"> <li>• ensures that children are involved in the assessment of their own learning and progress</li> <li>• develops children's capacity to be independent learners</li> <li>• develops children's self-confidence and image of themselves as successful learners of mathematics</li> <li>• ensures good communication and effective partnerships between all involved in children's learning, especially parents and carers</li> </ul>	
Identifying continuing professional development needs	<ul style="list-style-type: none"> <li>• uses an approach for which there is an infrastructure of support for both teachers and teaching assistants who are involved</li> <li>• ensures that all staff understand the whole-school approach to Wave 3 mathematics provision and their role within it</li> </ul>	