



Guidance

Curriculum and
Standards

Primary
National Strategy

Summary of the
National Numeracy
Strategy: Supporting
pupils with English as
an additional language

Primary teachers

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Summary of

**The National Numeracy Strategy:
Supporting pupils with
English as an additional language
(DfES 2000)***

*no longer in print

Introduction to this training file

This is a web version of the National Numeracy Strategy training file 'Supporting pupils with English as an additional language' printed in 2000 and no longer available. The training file was provided for all LEAs alongside a series of national conferences. Copies were sent to LEA numeracy teams and others in LEAs in a management or support role where relevant. Although some of the training approach has been preserved, many of the original documents are provided here as web references only where appropriate. Minor alterations have been made to some of the content and no video presentation is included. During 2004-5, the Primary National Strategy, working in partnership with the Ethnic Minority Achievement Team at the DfES, has developed a pilot programme in 21 pilot and 45 associate LEAs. The programme aims to raise the achievement of children learning EAL by increasing the confidence and expertise of mainstream primary teachers in meeting the needs of advanced bilingual learners.

Advanced bilingual learners have been defined by Ofsted as those who have had considerable exposure to an educational environment within which English is the first language and thus are no longer in the early stages of English language acquisition. Three key principles underpin the work of the pilot in defining effective support for pupils learning EAL and learning through EAL.

- Bilingualism is an asset, and the first language has a significant and continuing role in identity, learning and the acquisition of additional languages.
- Cognitive challenge can and should be kept appropriately high through the provision of linguistic and contextual support.
- Language acquisition goes hand in hand with cognitive and academic development, with an inclusive curriculum as the context.

This pilot is to become a key programme of the Primary Strategy from April 2005.

These materials provide some exemplification of the application of the key principles summarised above to the learning and teaching of mathematics. Ongoing development within the Primary National Strategy EAL programme will further exemplify effective strategies to support advanced bilingual learners in the learning of mathematics, as well as highlighting the opportunities afforded by mathematics as a vehicle for cognitive and academic language development.

The materials were designed to help Local Education Authorities provide training for teachers, assistant teachers and those who support children from different communities in a number of ways. Throughout the training, the term EAL staff is used to describe staff with an appropriate range of expertise. It is envisaged that the training will be packaged to suit the needs of individual schools, groups of schools, teachers, assistant teachers or central LEA staff. It is assumed that schools and other interested groups will have received training on many of the relevant issues following The National Literacy Strategy Conferences on 'Supporting Pupils Learning English as an Additional Language' held in Spring 2000.

Each section of this file provides a training module on a particular aspect of the implementation of the National Numeracy Strategy in primary schools and where appropriate, this is supported with appendices, articles and references that reflect relevant issues in mathematics.

The purpose of the training pack is to ensure equality of access for all children in their daily mathematics lesson with the aim of realising the highest possible attainment in mathematics for each child.

There should be clear, short-term objectives that support learning towards the key objectives for children in each year group and children should be clear as to the expectations teachers and others have of them.

Within this framework of setting appropriate, challenging targets and translating them into manageable, short-term objectives, many children for whom English is an additional language will require support during the daily mathematics lesson in order to achieve the targets. Within each part of the daily mathematics lesson there is scope for effective support for learning. There is also scope for supporting staff both inside and outside the classroom. This support can be provided in a variety of ways.

In order to target support effectively, all schools will need to begin with an audit of their present situation, including an analysis of all available data. In this respect the audit document, 'Auditing mathematics in your school', from the National Numeracy Strategy (NNS) should prove useful but may need adapting for particular circumstances or issues.

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We are grateful for the help of the Ethnic Minority and Travellers Achievement Project team, Brent LEA, and the staff and children of the following schools featured in the video:

Roe Green Primary School, London Borough of Brent LEA
Arnham Wharf Primary School, London Borough of Tower Hamlets LEA
St Thomas, C of E School, Royal Borough of Kensington and Chelsea LEA
Green Lane Primary School, Bradford LEA

Section 1

Background to the National Numeracy Strategy (NNS): current issues and trends

In this session consideration is given to the factors that contribute to success in mathematics for children from different communities.

Objectives

- To review the progress of children in the National Numeracy Project (NNP).
- To consider the current situation.
- To agree some of the factors contributing to the children's success.

Introduction: background information

The National Numeracy Strategy (NNS) began in 1999. It grew out of the National Numeracy Project (NNP) where children's attainment in mathematics improved with their involvement in the project.

In 1996 the NNP was introduced in a wide range of schools: urban and rural, large and small, mainstream and special. Over time, its impact was evaluated through:

- feedback from schools;
- feedback from consultants;
- reports and feedback from HMI;
- information from national test data;
- information from NFER.

Since the implementation of the National Literacy and Numeracy Strategies in primary schools, the above systems have remained in place. Further, an external evaluation is being carried out by a research team, lead by Michael Fullan, from the Ontario Institute for Studies in Education, University of Toronto (OISE/UT).

The NFER took on responsibility for organising the NNP testing programme from summer 1997.

The following table shows the pattern of testing.

Cycle of testing			
Date	Cohort 1 schools	Cohort 2 schools	Cohort 3 schools
	Entry tests in Y1, Y2, Y4		
May 1997	Mid-point tests in Y2, Y3, Y5	Entry tests in Y1, Y2, Y4	
June 1998	Exit tests in Y3, Y4, Y6	Mid-point tests in Y2, Y3, Y5	Entry tests in Y1, Y2, Y4
June 1999		Exit tests in Y3, Y4, Y6	Mid-point tests in Y2, Y3, Y5
June 2000			Exit tests in Y3, Y4, Y6

Each year group within the cohort was around 10 000 pupils so a total of 90 000+ pupils were tested at a series of time points between January 1997 and summer 2000.

Obviously, not every child in the appropriate year groups actually took the tests at each round, either because of absence or as a result of leaving or joining the school midway through their two years' 'run' with the NNP. All scores for all children were always included in the analysis and a sub-set (those with matching scores from more than one occasion) were used to measure progress made during the course of the project.

The main messages from the NFER testing are summarised here.

- Taken as a whole, average pupil scores increased significantly over the time in the NNP.
- In all cohorts, in all three rounds of testing, boys generally had higher scores than girls.
- 'Fluency in English' as a second language had a consistently significant relationship with test scores. Pupils more fluent in English were likely to achieve better scores than those less fluent in English.
- The effect of ethnicity varied between cohorts and rounds of testing.

Free school meals eligibility and SEN status were associated with lower test scores at each round of testing in all cohorts. Girls made a little less progress during the course of the NNP than boys. Apart from this, no other pupil background factor had a consistent positive or negative effect on progress. However, success in mathematics seemed to have a positive effect on performance in English. Not only did children with English as an additional language attain higher in mathematics but schools showing such improvement also realised improvement in English scores at the end of Key Stage 2.

Factors contributing to success

There are many reasons why children from ethnic minority communities would have gained significantly from the NNP in both mathematics and English. Some of the contributory factors to the progress made by children from ethnic minority communities are:

- emphasis placed on oral work;
- importance of talk in learning;
- time allocated to thinking, explaining and 'having a go';
- emphasis placed on recall of facts;
- teaching of specific mathematical vocabulary;
- greater emphasis on visualising numbers, number lines and grids.

Details of two relevant papers: *Making the difference* and *Raising the attainment of minority ethnic pupils* are given in the References section in the Appendix.

Key issues raised in these papers will be familiar but it is worth highlighting the fact that successful practice includes:

- a strong and determined lead on equal opportunities given by the headteacher;
- the importance of listening to pupils, parents or carers and staff;
- monitoring and analysing performance rather than having ideas or hunches;
- high expectations through structures of accountability for staff and through close monitoring of individual achievement.

Two of the key messages from the external evaluators, OISE/UT, are concerned with assessment and the 'power of professional learning communities'. LEAs themselves carry out detailed analysis of the attainment and progress of various groups of children over time and it has become increasingly important to analyse and use the information available if schools and LEAs are to continue to raise standards in mathematics further.

HMI findings concerning mathematics stress the importance of improving teachers' subject knowledge as a means of improving the quality of teaching.

Section 2

Ethos and practices that support EAL learners in their mathematics

Objectives

- To consider an environment that ensures effective learning in mathematics for all children.

Teachers and others will be familiar with key principles of inclusion, some of which are listed below.

Key principles of inclusion

- A whole-school commitment to raising educational achievement through educational inclusion.
- Effective use of target setting leading to greater equality of outcome.
- Focused support to ensure full access to the curriculum.
- Commitment to partnership approaches in the deployment of additional resources.

Some important aspects are as follows.

- It is a whole-school responsibility to aim for the highest possible attainment for all pupils.
- Assessing, guiding, teaching and supporting children or working with their families and communities is not something support staff should do in isolation.
- Identifying needs of staff teams, raising awareness of various issues and providing staff training are crucial aspects in ensuring greater equality of provision and higher outcomes.
- Inclusion is a fundamental entitlement for all pupils.

The National Curriculum Handbook for primary teachers in England outlines three principles of inclusion:

- setting suitable learning challenges;
- responding to pupils' diverse learning needs;
- overcoming potential barriers to learning and assessment for individuals and groups of pupils.

Factors affecting children's learning in mathematics

The all-inclusive school will anticipate and address potential barriers by:

- being aware that lack of familiarity with the school system can affect children's learning adversely;
- affording proper status to support staff and to teachers and teaching assistants from minority communities;
- ensuring that staff and classrooms are sensitive to different cultures;
- ensuring that classrooms are organised so that all children have access to resources;
- ensuring that work both challenges children and meets their needs as learners.

There are a number of practices that can adversely affect learning in mathematics. Staff sensitivities to cultural needs, practices and expectations will help alleviate these and will include the following.

- Teachers can assume that children know the context of work when they do not, for example with games such as snakes and ladders.
- Teachers need to be aware that children can be at a disadvantage through lack of particular experiences, such as going on a boat trip.
- Children's lack of familiarity with certain contexts or experiences can lead to a lack of progress and teachers can attribute this to a lack of mathematical understanding.
- Teachers may miss opportunities to refer to, or in other ways acknowledge, the origin of our number system, games, etc.
- Classrooms do not always display numbers in other languages.
- Songs, rhymes, poems and stories may not reflect a sufficiently diverse and multicultural society, especially for younger children.[More space before next line]
- Teachers may not be sufficiently aware of potential differences in home and school approaches to numeracy and may need help in addressing these.

An effective mathematical environment is an environment where:

- Children's contributions in mathematics are heard and valued.
- Children are willing to demonstrate methods and explain reasoning.
- Children are encouraged to take risks in their learning of mathematics.
- Strategies and expectations ensure that all children from minority communities realise their full potential in mathematics.
- Opportunities for peer and small-group talk enable children to make sense of and apply their mathematical ideas.

Section 3

The use and development of language in the daily mathematics lesson

Objectives

- To examine the use and development of language in the daily mathematics lesson.
- To identify effective strategies for teaching mathematics in multilingual classrooms.

Oral work is developed during each part of the daily mathematics lesson.

- In the oral and mental starter children chant and count in unison, demonstrate their methods and explain their strategies.
- In the main part of the lesson the teacher uses questions and strategies to involve all children and uses visual aids to exemplify mathematical terms and model the correct use of mathematical vocabulary in the context of the activity.
- In the plenary the teacher takes feedback from the children, clarifies misconceptions and gathers evidence of children's progress.

Each part of the daily mathematics lesson:

- emphasises the role of language and the use of mathematical vocabulary;
- provides opportunities for children to talk about the mathematics they are learning, ask questions and explain mathematical ideas;
- involves a range of direct, interactive teaching strategies including effective use of other staff.

Direct, interactive teaching is a key feature of teaching. It is a two-way process between the teacher and the children. Direct teaching includes: directing, instructing, demonstrating, explaining and illustrating, questioning and discussing, consolidating, evaluating children's responses and summarising.

The plenary, which has a range of purposes, provides specific opportunities for:

- reviewing the main teaching points and summarising key facts, ideas and vocabulary to help children know what they have learned;
- dealing with common difficulties or misconceptions;
- assessing informally the work of any groups with whom the teacher has not been working;
- making links to other work in mathematics and other subjects outlining next steps and setting homework.

Effective strategies for teaching mathematics in multilingual classrooms

The following key features are exemplified in the daily mathematics lesson:

- an emphasis on hearing and using appropriate mathematical vocabulary;
- a range of visual clues to reinforce the mathematics;
- opportunities to use language in concrete situations and in abstract form;
- use of talk and discussion focused on mathematics;
- opportunities for children to demonstrate what they know and can do;
- opportunities for children to justify, solve problems and use mathematics in a range of contexts;
- the repetition of answers in sentences;
- the provision of written models of answers;
- the management of the variables when adapting the work, taking account of:
 - the level of mathematical difficulty;
 - the complexity of mathematical language;
 - the provision of a range of contexts;
 - the basic understanding needed to use and apply the knowledge and skills.

It is important not to underestimate what children can do mathematically because they are new learners of English.

When children talk about their mathematics work they share ideas and learn from each other.

When children disagree with each other and argue their case they have the opportunity to consider other viewpoints and gain more understanding.

When children listen to one of their peers explain a mathematical concept, their own understanding of what they are learning is often reinforced.

Children who are learning English as an additional language may understand the question asked but their grasp of English may not yet allow them to articulate their response.

The expectation should be that these children progress in their mathematical learning at the same rate as other pupils of their age.

The overall aim is to raise standards for all children and a key factor will be the expectations set for the children and the way these are made clear to them.

Section 4

Effective support for teachers and pupils

This section of the original file dealt with issues of effective partnerships both inside and outside the classroom.

It emphasised the importance of:

- an LEA and school commitment to raising achievement through educational inclusion;
- a commitment to partnership approaches in the deployment of additional resources;
- effective, focused support to secure full access to the mathematics curriculum.

The section dealt specifically with the role of additional adults in the mathematics classroom.

The Primary National Strategy has been developing training for teaching assistants who support children and others learning English as an additional language. Readers are advised to refer to the Primary National Strategy's website for further information:

<http://www.standards.dfes.gov.uk/primary>

Section 5

Monitoring, assessment and accountability

Objectives

- To consider the identification and targeting of support in mathematics to specific groups of children.
- To consider strategies that will ensure children receive effective support to raise their attainment in mathematics even further.

LEAs and schools are aware of their specific duties in relation to all pupils. LEAs and schools have monitoring and evaluation systems in place to chart and steer the progress of individual children and groups of children. Key Stage 1 and Key Stage 2 National Curriculum test results are collated and analysed, school by school, differences according to gender and ethnic group are identified, schools failing to meet or exceeding their targets are identified and action is taken where appropriate. Where a particular group of pupils across the LEA causes concern, this is investigated and appropriate action is taken in cooperation with schools. Schools strive each year to raise their standards in mathematics and to track the progress of children leading to each school meeting the challenging targets it has set. Schools are able to identify the children or groups of children that are making expected progress, making more than expected progress or falling behind their counterparts in their rate of progress.

Sometimes, underperformance or slow progress arises from specific aspects of mathematics. To investigate this, teachers study mathematics test papers completed by pupils to identify errors and other difficulties. They address these problems through appropriate adjustments to the next year's teaching programme or to their own current teaching programme. Key Stage 1, Key Stage 2 and optional National Curriculum test results are analysed, class by class and pupil by pupil, differences according to gender and ethnic group are identified, groups and individual pupils working below or above their targets are identified and action is taken where appropriate.

All schools analyse their pupils' test results but not all schools link this analysis closely to the deployment of staff and to identifying specific needs of groups of pupils. In some schools data is not sufficiently well analysed to identify need and to focus support. It is important to examine performance data of all types to make a comprehensive analysis.

Schools might carry out the following.

- Focus on ethnicity, stage of learning English and gender initially in the National Curriculum tests, optional tests and any other tests used by the school to track progress.
- Compare results with:
 - previous years;
 - overall performance;
 - national averages;
 - teacher assessment.
- Identify differences in performance by:
 - ability;
 - gender;
 - teaching groups;
 - ethnic groups;
 - new arrivals.
- Identify contributory factors.
- Begin to question underlying assumptions:
 - Are these children being 'protected' and therefore insufficiently challenged in mathematics?
 - Is their lack of competence in English clouding their knowledge and understanding in mathematics?
 - Where the mathematics is bound up in context, are the children being marginalised?
 - Is the identification of special educational needs being clouded by other factors, cultural, learning English as an additional language, absence from school, etc.?
- Develop whole-school strategies to raise attainment further by:
 - groupings, whole-class teaching, differentiation strategies;
 - teaching styles, making learning objectives and teacher expectations explicit to children;
 - highlighting mathematical vocabulary, examining children's work.
- Use information from monitoring to raise questions about strategies to reverse underachievement.
- Build whole-school strategies into the school's development plan along with specified targets and curricular targets.
- Identify the specific aspects of mathematics that the pupils are finding too challenging.
- Recognise that this process serves an accountability purpose as well as informing professional development and contributing to a school improvement strategy.

Throughout this work it will be important to remember:

- the continuing need to ensure understanding of specialised mathematical vocabulary such as perimeter, pentagon, parallel;
- the need for children to be given frequent opportunities to explain and refine their thinking about specific mathematical situations.

These are key messages for working with children from ethnic minority groups.

Most schools also have a cycle of intervention to be used appropriately for specific children or groups of children. It is important that all staff are given the same consistent messages about teaching mathematics in the school. It is equally important that all staff set high expectations for all children.

Note: it is important that readers access the PNS website for up-to-date work on assessment and in particular that they read the Assessment for learning sections in the *Excellence and Enjoyment: Learning and teaching in the primary years Professional development materials* (DfES 0518-2004 G).

Appendix

References

Raising the Achievement of Minority Ethnic Pupils is available from

<http://www.ofsted.gov.uk>

www.standards.dfes.gov.uk/ethnicminorities

www.standards.dfes.gov.uk/primary

The National Curriculum Handbook for Primary Teachers in England

www.nc.uk

Excellence and Enjoyment: Learning and teaching in the primary years (DfES 0518-2004 G)

available from Prolog Tel: 0845 602 2260

Resources on working with parents and carers

The National Numeracy Strategy's *Guide for your profession development: Book 3* and *Book 4* contains:

- *Raising standards in mathematics in Key Stage 2, Key Stage 1.*
- Special schools pack of general parents' or carers' leaflets: *Learning about mathematics at home and at school for YR, KS1 and KS2* with order form for extra copies (Basic Skills Agency)
- Colour leaflet for each year group and black and white photocopy masters of leaflets for each term outlining targets for the year and suggestions of activities for parents or carers to do at home with their child. The CD-ROM contains these leaflets as files for adaptation by individual schools.

The video, *Mathematics at home and at school making a difference together* available in Arabic, Bengali, Chinese, Gujarati, Hindi, Punjabi, Somali, Turkish, Urdu and English was produced by the Basic Skills Agency. The video is available from Prolog Tel: 0845 602 2260 and the code is MHS for the version in English.

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