

# Keys to learning in literacy and mathematics

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Guidance

Curriculum and standards

# Primary *National Strategy*

## Keys to learning in literacy and mathematics

**Primary and  
Foundation Stage  
teachers; literacy,  
mathematics and  
ICT subject leaders**

Status: Recommended

Date of issue: 09-2006

Ref: 0360-2006DOC-EN

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# Keys to learning in literacy and mathematics

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These materials form part of the support materials for the renewed literacy and mathematics frameworks. The Primary National Strategy's aim is to provide primary practitioners and leadership teams with a practical set of materials, support and guidance to encourage and enable effective teaching and learning using ICT.

In December 2005, Ofsted's evaluation of the Primary National Strategy and its implementation in schools reported that:

'The proportion of lessons in which teachers and pupils use ICT has increased significantly. Teachers' use of ICT to challenge and engage pupils' interest and enthusiasm for learning is improving. Many schools have installed interactive whiteboards and more teachers are using them effectively to teach new skills, to provide good models and to introduce a broader range of source material directly from the Internet. However, few have successfully linked the good use of interactive whiteboards for whole class teaching with effective follow-through into pupils' own use of ICT to support independent work in lessons.'

Ofsted, December 2005. *Primary National Strategy: An evaluation of its impact in primary schools 2004/05*

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Keys to learning in literacy and mathematics aims to support practitioners in making these links between their own use of ICT to support teaching and children's use of ICT to support their learning. It is designed to be used by leadership teams to support professional development for all staff, focusing on areas of literacy and mathematics commonly identified as priorities. The materials

support the raised profile of the use of ICT to support learning and teaching within the renewed Frameworks for teaching literacy and mathematics.

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## Leading the use of ICT

To make effective use of ICT to support learning and teaching, practitioners need to feel confident in their own use of ICT, their teaching approach, their children's ability to use ICT and the intended learning outcomes. Before beginning this programme of professional development, the school leadership team might want to consider:

- What is it we want ICT to help our children to achieve?
- How will we plan to get there as a school?
- What do we need to do first?
- What support, training and professional development are we going to provide?
- What impact will we look for in the classroom?
- How will we identify our progress and future needs?
- How will we decide we all are achieving our intended learning outcomes?

Sharing and developing the outcomes of these questions with staff will help to establish a shared purpose for a focus on the use of ICT.

## Choosing your strand

Keys to learning provides materials to support seven areas of literacy and mathematics:

- Early reading
- Reading on screen
- Writing Key Stage 1
- Writing Key Stage 2
- Calculation
- Problem solving
- Shape and space

You will need to choose the most appropriate strand for your school or setting based on your self-evaluation. Look at your evaluation data to identify which of these materials would best support your school development priorities. You should use both qualitative and quantitative data such as:

- practitioner observations and assessment of children's learning
- monitoring carried out by the school leadership team
- analysis of optional and statutory assessment tests
- work scrutiny
- conversations with children.

The materials to support each strand are described on pages 7-13.

Alternatively, you might have identified the need to move forward the children's and practitioners' use of ICT to support learning in your school. If this is your identified priority, read the strand descriptions to decide as a leadership team which would

be the most appropriate strand to follow. With both routes, the focus will be on improving the learning and teaching of literacy and mathematics through the use of ICT.

## Overview of Keys to learning: components

The Keys to learning DVD contains a wide variety of resources designed to support practitioners in making effective use of ICT.

These include:

### Professional Development Meeting outlines

The following pages give more detail about the programme of professional development meetings. These meetings are supported by a set of materials and video clips all linked from a screen of the DVD.

### Spreadsheet workbooks

The workbooks on this DVD are part of a set of materials that have been developed for the National Whiteboard Network. The workbooks provide flexible resources that can be used to teach new ideas and to provide opportunities for consolidation and application of knowledge, skills and understanding. Further workbooks can be found on the National Whiteboard Network website at [www.nwnet.org.uk](http://www.nwnet.org.uk). The workbooks are also accompanied by user guides.

### Interactive teaching programmes (ITPs)

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These programmes have been developed by the Primary National Strategy to provide simple ICT-based images to support modelling, demonstration and exploration of mathematics and literacy. On this DVD they come

complete with a paper-based user guide and a 'screen-capture' video user guide to explain how to use them.

### Lesson outlines and teaching sequences

The mathematics strands are supported by lesson outlines giving examples of how ICT can be used to support learning and teaching in calculation, problem solving and shape and space. The outlines detail the key teaching points and questions, how the practitioner and children could use ICT, and are accompanied by all of the resources needed to teach the lesson.

Teaching sequences for the literacy strands give examples of how ICT can support early reading in Foundation Stage and Key Stage 1 and reading comprehension at Key Stages 1 and 2. There are also lesson outlines to support narrative and non-narrative writing at Key Stages 1 and 2. The materials provide examples of teaching sequences for using ICT in literacy with supporting resources and background notes.

## Interactive whiteboard files

Many of the strands are supported by interactive whiteboard files. These include files to support the activities in the Primary National Strategy 'Playing with sounds' materials as well as files supporting learning and teaching in mathematics.

## Interactive texts

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The DVD contains various interactive and multimodal texts. These include support materials for developing reading on screen as well as exemplar texts and templates to support writing. They are designed to be used flexibly and adapted to the needs of children.

## Support materials for reading and writing

The reading on screen, writing Key Stage 1 and writing Key Stage 2 strands of Keys to learning are supported by a range of documents such as guided and shared reading session notes, exemplar texts, guidance for planning a teaching sequence and notes on the text structures. There are also banks of images, video clips and sound files to support multimodal reading and writing.

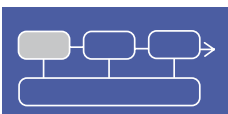
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## Video clips

Keys to learning is also supported by a set of video clips showing classroom use of ICT and practitioners reflecting on how the use of ICT supports learning and the implications for themselves and their school. The clips cover each of the seven strands of literacy and mathematics included on the DVD, and also draw upon the PNS materials 'Learning and teaching using ICT: Example materials from Foundation Stage to Year 6'.

## Overview of Keys to learning: professional development

Each of the strands of Keys to learning follows a similar format and approach to professional development. Each strand follows a 'route map' through three professional development meetings designed to establish and enhance the current situation in learning and teaching within your chosen strand. It explores approaches and a range of materials available to enhance learning and teaching in this area, and reviews the impact of using these approaches and materials in the classroom.

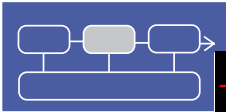


### Professional Development Meeting 1: Taking Stock

This professional development meeting introduces the Keys to learning CPD programme, and provides an opportunity to consider the learning and teaching of a specific strand of mathematics or literacy, to review the role ICT currently plays in

the learning and teaching of that strand, and to prepare for subsequent work.

Within this meeting, members of the leadership team will explore why that strand is a priority for their school and lead a review of current practice and outcomes.



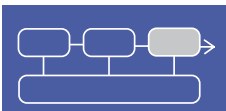
## Professional Development Meeting 2: Exploration

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The main focus of the Exploration meeting is to explore approaches to using ICT to enhance the learning and teaching of the chosen strand of literacy or mathematics. New resources provided in Keys to learning will be explored, with opportunities to discuss how these support children's learning.

To support this professional development meeting there are a series of video clips of classroom practice. These include whole-class teaching using ICT; paired, small group and individual work using computers or laptops, digital cameras and interactive whiteboards; teaching assistants working with groups; and work in the Foundation Stage setting, classroom and computer suite.

During this session practitioners will be asked to identify the support they will need to put the materials into practice, and to begin to plan how to incorporate the materials into a teaching sequence for their class.



## Professional Development Meeting 3: Review and Reflect

During the Review and Reflect meeting colleagues will work together to share experiences of using the Keys to learning materials to support learning and teaching in the chosen strand of mathematics or literacy, and to evaluate the impact this has had on children's learning.

The session is supported by video clips of practitioners reviewing their use of ICT both in specific lessons and across the school.

There is also an opportunity during the session to consider how materials can be adapted to suit particular learning intentions and teaching contexts, and to work together to plan how the use of ICT developed throughout the CPD programme can be enhanced and sustained.

## Early reading

This strand will support you in planning how children and practitioners can use ICT to develop children's early reading skills and explore how the resources can be used to support practical and active learning. The strand reflects the recommendations of the Rose Report on the teaching of early reading.

In the learning and teaching of early reading, ICT can provide opportunities to:

- use the IWB and on-screen interactive reading materials to
  - 1) teach phonic knowledge
  - 2) teach the application of the skill of blending phonemes to read words
  - 3) broaden children's reading experience



- develop reader engagement, enjoyment and response
- extend reading strategies to include radial reading and the orchestration of information to build a picture of what is happening.

In this strand you see classroom examples of children using ICT to build progression in early reading. The videos show practitioners teaching early reading, teachers and teaching assistants using interactive materials developed from *Playing with Sounds* with the whole class and groups.



The resources support the use of the IWB to provide for the range of children's learning needs and show how ongoing assessment can effectively be used to build on prior knowledge.

The three professional development sessions provide the opportunity to:

- review the learning and teaching of early reading in your school and the current role of ICT in supporting progression in reading
- explore approaches using ICT and materials on DVD to enhance the learning and teaching of early reading skills supported by video examples of practice
- try out approaches, ideas and resources in the classroom to support children's learning needs and ensure progression
- review the impact of ICT on learning and teaching early reading and plan next steps.

The professional development programme provides the opportunity to work together with colleagues to review and revise the ways that ICT is used to support learning and teaching of early reading. The sessions allow for discussion of how best to build on current knowledge, and to use and adapt approaches and resources to support the needs of the children and staff.

As well as the video clips of practice, the resources on the DVD provide interactive reading activities, on-screen texts and suggested teaching sequences.

## Reading on screen

This strand will develop children's experience of interactive, non-linear and/or multimodal texts and explore how such texts can be used particularly effectively to support and encourage the development of comprehension and reader response.

In the learning and teaching of reading comprehension, ICT can provide opportunities to:

- use on-screen interactive materials to develop reading comprehension skills
- engender reader engagement, enjoyment and response
- develop awareness of how texts are written, structured and presented for particular purposes and effects.

In this strand there are video examples of children using ICT to support synthesising information from different sources and building comprehension skills in

shared and guided reading sessions. There is also a clip of a practitioner explaining how ICT has impacted on the children's learning.

For Years 1 and 2 the interactive materials are broadly parallel to books in Book Bands 6 (orange) and for Years 2 to 3 parallel books in Book Band 7 (turquoise). These help in reading aloud, prediction, identification of key themes and response. Years 3 and 4 interactive materials build on those skills and extend reading strategies to develop reading styles for different text types. Materials and resources for Years 5 and 6 include suggestions for web-based activities and support literal, deductive and inferential responses as well as developing understanding of authorial intent.

The three professional development meetings provide the opportunity to:

- review current practice and understanding and the use of ICT in learning and teaching reading comprehension
- explore approaches using ICT to enhance learning and teaching reading comprehension
- review the impact of ICT in developing reading comprehension
- plan for the inclusion of ICT texts in regular reading provision across the whole school.

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The professional development sessions provide opportunities to work together with colleagues to review and revise approaches to learning and teaching reading comprehension using ICT. The sessions allow for discussion of what reading comprehension means and how it might be developed by the use of non-linear/multimodal and interactive ICT texts.

As well as video clips of practice, the resources on the DVD provide fiction and non-fiction interactive on-screen texts and suggested teaching sequences.

## Writing Key Stage 1

This strand will develop children's understanding of interactive, non-linear and/or multimodal texts and explore how such texts can be used to stimulate and support the writing process to develop narrative writing in Key Stage 1.

In the learning and teaching of writing at Key Stage 1, ICT can provide opportunities to:

- use the IWB and interactive and multimodal ICT texts to teach story structure
- engender engagement in the composing process
- develop character, feelings and motives in writing.

There are two Writing Kits for Key Stage 1: Lost Teddy (Years 1 and 2) and The True Story of Little Red Riding Hood (Year 2). These include written stories, interactive or multimodal texts and templates which can be used on the IWB or displayed on a data projector to aid shared, guided and independent narrative composition and suggested teaching sequences with formats for use on IWBs.

Video examples for this strand show children using the Writing Kits Lost Teddy and The True Story of Little Red Riding Hood to write their own stories and make multimodal texts.

The three professional development meetings provide the opportunity to:

- review current issues and concerns about writing in your own school
- use the Writing Kits to try out approaches to support the learning and teaching of writing composition
- reflect on the use of ICT in teaching writing, identify challenges and discuss possible solutions
- plan next steps and decide how to monitor and share experiences.

The professional development meetings provide the opportunity to consider with colleagues how ICT can support the complex process of learning to write. The sessions allow for experimenting with multimodal materials and discussion of how writing standards can be improved by the integrated use of ICT in learning and teaching.

## Writing Key Stage 2

This strand will develop children's understanding of interactive, non-linear and/or multimodal texts and explore how such texts can be used to stimulate and support the writing process to develop both narrative and non-fiction writing in Key Stage 2.

In the learning and teaching of writing at Key Stage 2, ICT can provide opportunities to:

- use the IWB and interactive and multimodal ICT texts to teach narrative and explanation texts
- engender engagement in the composing process
- develop composition of writing and multimodal texts.

There are two Writing Kits for Key Stage 2: On the Run (Years 3 and 4) which is a story with alternative endings, and Castle Attack (Years 5 and 6) which is a flexible set of resources based on the legend of Robin Hood. Both Writing Kits can also be adapted for other years. The kits include written stories, video of a told story (Castle Attack), information materials on screen and as text files, interactive or multimodal texts and templates which can be used on the IWB or displayed on a data projector to aid shared, guided and independent writing of narrative and explanation text types. These are accompanied by suggested teaching sequences with ICT resources.

Video examples for this strand show children using the Writing Kit On the Run to write narrative and make multimodal texts.

The three professional development meetings provide the opportunity to:

- review current issues and concerns about writing in your own school or setting
- use the Writing Kits to try out approaches to support the learning and teaching of writing composition

- reflect on the use of ICT in teaching writing, identify challenges and discuss possible solutions
- plan next steps and decide how to monitor and share experiences.

The professional development sessions provide the opportunity to consider with colleagues how ICT can support the complex process of learning to write. The sessions allow for experimenting with multimodal materials, sharing examples of children's writing arising from the activities, and discussion of how writing standards can be improved by the integrated use of ICT in learning and teaching.

## Calculation

This strand will support you in planning how children and teachers in your school can use ICT to develop children's knowledge of number facts, understanding of the meaning of and relationship between addition, subtraction, multiplication and division, and ability to apply this knowledge and understanding to calculation and problem solving.

In the learning and teaching of calculation, ICT can provide opportunities to:

- use images to support rapid recall of number facts and their use in calculation
- learn and consolidate efficient, accurate strategies for carrying out calculation
- build an understanding of the structure of numbers and provide the opportunity for children to manipulate numbers, explaining and justifying their reasoning and refining calculation strategies.

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In this strand you see two classroom examples of children using ICT. In Year 2, children use an ITP in the computer suite to build unknown multiplication facts by combining known facts.

In Year 4, an ITP supports the starter activity where the whole class are practising quick recall of multiplications and developing their knowledge of the properties of multiplication tables. They then use laptops to consolidate their knowledge of the grid method of partitioning, before using a flexible spreadsheet to help them learn how to partition numbers themselves to aid calculation.

During the three professional development meetings, you have the opportunity to:

- review the learning and teaching of calculation within your school and the current role of ICT
- explore approaches to teaching and learning calculation using ICT and materials on the DVD to support these approaches
- try out the approaches and materials in the classroom, exploring how ICT can be used to develop the language, models and images associated with calculation
- review the impact the use of ICT had on learning and plan next steps.

An essential element of the professional development is the opportunity to work together with colleagues to evaluate and improve the way ICT is used to support learning and teaching in calculation. In the example illustrated, a teaching assistant and teacher work together to discuss how they can use ICT more effectively to enhance learning of calculation strategies.

In addition to the video clips of classroom practice, the resources on the DVD provide lesson outlines, interactive teaching programmes, spreadsheet workbooks, interactive whiteboard files, video clips and skills tutorials.

## Problem solving

This strand will support you in planning and implementing the use of ICT to support problem solving as a strand of mathematics and by embedding it throughout the mathematics curriculum. The professional development materials explore how ICT can be used flexibly to support children's reasoning, enquiry and problem solving skills.

In the learning and teaching of problem solving, ICT can provide opportunities to:

- move objects and shapes to generate new scenarios and to reveal hidden information.
- adapt files so they can be used again, providing children with problems that involve different objects, characters or statements
- model strategies involved in solving the problems. The tools used to record steps and ideas can be demonstrated and adjusted with the children so that they can evaluate the benefits of the different approaches.

In the second professional development meeting you will explore practically a Year 1 problem and watch a Year 5 lesson. The Year 5 lesson exemplifies the problem modelled on an interactive whiteboard followed up by children using laptops to solve similar problems before writing their own to share in the plenary or a later lesson. There is also discussion about how the lesson in Year 1 lays the foundations for this work in later years.

In professional development meeting 3 you will consider how an adaptable template can be used in Key Stage 1 and Key Stage 2. This is illustrated by video material showing Year 6 children using the template independently to support their learning.

The three professional development meetings provide the opportunity to:

- review the learning and teaching of problem solving throughout the school
- watch some examples of problem solving using ICT as a learning and teaching tool
- explore adaptable materials to support you to teach problem solving through the use of ICT and review the impact on learning

There will be several opportunities to discuss approaches and adaptations used to support children's learning throughout the development sessions.

In addition to the video clips of classroom practice, the resources on the DVD provide lesson outlines, interactive teaching programmes, spreadsheet workbooks, interactive whiteboard files, video clips and skills tutorials.

## Shape and space

This strand considers how you can plan for the use of digital cameras, interactive teaching programmes, computers and interactive whiteboards to develop children's ability to reason about shapes and apply knowledge of their properties.

Using ICT to support learning and teaching of shape and space offers the potential to develop speaking and listening skills, encouraging children to refine their use of mathematical language. In this strand we see two classroom examples illustrating the use of the materials and approaches discussed in the professional development meetings. In Y1, children are developing their understanding of the properties of 3-D shapes. They interview each other, recording their interviews using hand-held digital cameras, and replaying the recordings to support refining and improving their language.

In Y6, children use an ITP in the computer suite to test out hypotheses about the properties of pentagons. As they find examples that support their conclusions, they record the supporting images and their explanations.

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During the three professional development meetings, you have the opportunity to:

- review the learning and teaching of shape and space within your school and how ICT hardware and software is currently used
- explore approaches to teaching and learning using ICT and materials on the DVD to support these approaches, supported by video examples of these approaches in the classroom
- try out the approaches and materials in the classroom
- review the impact this had on children's ability to use and apply their understanding of the properties of shape and space and plan next steps for the use of ICT by both children and teachers.

An essential element of the professional development programme is the opportunity to work together with colleagues to evaluate and improve the way ICT is used to support learning and teaching in shape and space. In the example illustrated, a subject leader and fellow Y6 teacher work together to review a lesson in which children use ICT and consider the implications for their school approach to professional development in using ICT.

In addition to the video clips of classroom practice, the resources on the DVD provide lesson outlines, interactive teaching programmes, interactive whiteboard files, video clips and skills tutorials.

## Using the DVD

### Adapting the materials for use in your school

The materials in Keys to learning in literacy and mathematics have been designed as a starting point for the exploration of the use of ICT to support learning and teaching. They will have the greatest impact if they are adapted for your own needs. To support this:

- documents such as lesson outlines and teaching sequences are provided as word documents so they can be amended
- the video materials to support professional development meetings are provided in separate 'chapters' so you can select the elements of video most supportive for your school
- images and sound files for the literacy strands are provided as stand-alone files so you can use them as a resource bank, as well as looking at how they have been used within multimodal and interactive texts
- flexible materials such as spreadsheet workbooks and ITPs have been included, along with guidance on how you can use them in different year groups for different learning outcomes.

### Start screen

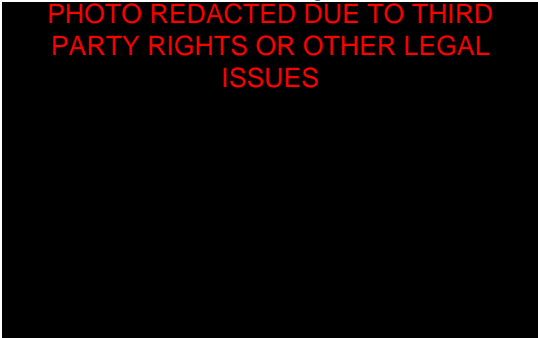
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Begin by playing the introductory video which outlines the Keys to learning resource. Choose whether to select one of the professional development strands to follow through, or to go directly to the 'all resources' section where you can search by year, strand and/or type of resources.

### CPD route map

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From this page you can select the professional development meeting you wish to run with your staff. You can also select the resources available on the DVD to support your chosen strand.

## Professional development meeting pages

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This page allows you to access all of the resources you can draw upon to run the professional development meeting. These materials include printable meeting outlines and video clips for every strand, and materials such as IWB files, interactive and/or multimodal texts, ITPs and spreadsheet workbooks as appropriate for each strand. Selecting the video clips button takes you to a screen where you can select the sections of video you want to use within the meeting.

## Strand resources

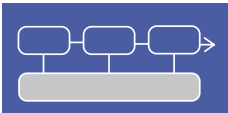


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Under each strand you have the opportunity to explore the resources available to support that specific strand. These are organised into Key Stage and type of resources. As you hold your mouse pointer over each button, information will be displayed about the available resources. The coloured icons accompanying the resources have a key to represent their type and purpose. When you select a type of resource, you will be given the option of opening or saving individual files or 'bundles' of associated files, such as ITPs linked to user guides supporting their use.

The 'hat' symbol takes you to the page where tutorials can be accessed. When you select a file that has an associated tutorial, the 'hat' button pops up with a message to tell you that the tutorial is available. These tutorials cover skills such as editing text and inserting images into multimedia presentations, changing the security levels to allow spreadsheet workbooks to work effectively, and recording work carried out on an ITP in a word processing document as well as video guides to show how to use all of the ITPs.

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## Searching for resources



You can choose to search by a combination of year group, strand or type of resource, selecting as many or as few search criteria as you wish. When you have carried out a search, the results will be displayed and you will be offered various options. You can choose to save or open individual files, or to save 'bundles' of files. Ticking the 'save bundles' option will give you all of the resources on the DVD which have been grouped together to help you use them effectively. For example, where there is an ITP on the DVD which is used within a lesson outline, you can choose to download the ITP, the associated lesson outline and any other resources used within that lesson, and the user guides available to support the use of the ITPs. An example of a literacy 'bundle' is a writing kit which offers you digital photographs, sound and video files, writing texts and templates and guidance materials.

### Help file

The help file is accessible from every screen using the '?' icon. It provides support for navigating the DVD, accessing and downloading materials, using the tutorials and user guides and searching for resources.

## Guiding principles when selecting a programme for teaching phonics

The Rose report recognises that there are a number of

‘differing approaches to teaching reading in general, and phonic work in particular...the common elements in each programme - those that really make a difference to how well beginners are taught to learn to read and write - are few in number’.

*Independent review of the teaching of early reading. Final report, Jim Rose, March 2006.*  
DfES 0201-2006DOC-EN.

The key features of high quality phonic work as identified by the report are to teach beginner readers:

- grapheme/phoneme (letter-sound) correspondences (the alphabetic principle) in a clearly defined, incremental sequence
- to apply the highly important skill of blending (synthesising) phonemes in order, all through a word, to read it
- to apply the skills of segmenting words into their constituent phonemes to spell
- that blending and segmenting are reversible processes

Schools should select their phonic programme from the range available, whether commercially produced or Primary Strategy materials, with these recommendations in mind. Whichever scheme is chosen, it is important to audit it against these recommendations and then to implement the selected programme ‘with fidelity’, that is, consistently and regularly.

Throughout these PNS materials, ‘Playing with Sounds’ is used as an example of a possible programme. In the light of the Rose report, ‘Playing with Sounds’ is to be reviewed and enhanced to take more account of the four interdependent strands of language.

The Primary National Strategy would like to thank all the children and adults involved in filming for Keys to Learning.

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**Ref: 0360-2006DVD-EN**

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