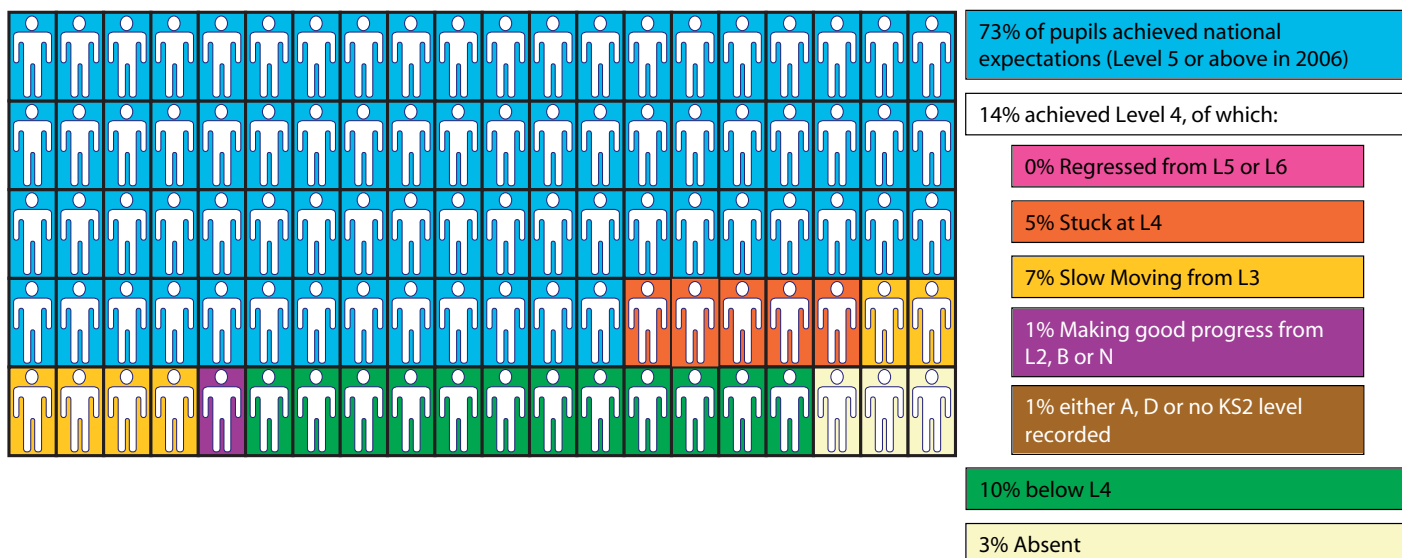


Getting back on track – pupils who make slow progress in English, mathematics and science in Key Stage 3

Making Good
Progress Series

department for
children, schools and families

Pupil Progression Chart Key Stage 3



The pupil progression chart is a powerful tool that can be used to represent the proportion of pupils who are meeting the national expectation at the end of the key stage, as well as the proportion who do not. Crucially the chart highlights the proportion of pupils achieving particular progression trajectories during the key stage. Each 'stick person' represents 1% of the pupil cohort in Year 9. In the charts used throughout this report:

Blue represent pupils who reached national expectations (Level 5).

The rest of the colours represent those who did not reach national expectations.

- Pink represents those who have regressed from the level they achieved at Key Stage 2.
- Orange represents those pupils who achieved Level 4 at Key Stage 2 but have not progressed since.
- Yellow represents those pupils who achieved Level 3 at Key Stage 2 but did not reach national expectations (Level 5) at Key Stage 3.
- Green represents those pupils who are two levels or more below national expectations.

This report focuses on a group of pupils who started Key Stage 3 at Level 4 but in Year 8 and 9 were judged to be at risk of not achieving Level 5 by the end of the key stage.

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Chapter 1: Introduction

The proportion of pupils achieving Level 5 in English, mathematics and science at the end of Key Stage 3 has increased significantly since these subjects became a key focus of the Key Stage 3 National Strategy. The improvements are shown in the table below:

Subject	% Level 5+ (benchmark date)	% Level 5+ (2006)
English	57% (1997)	73%
Mathematics	60% (1997)	77%
Science	59% (1998)	72%

However, even with equal access and despite everyone's best efforts, pupils do not proceed or progress at the same rates. Many pupils who do well at Key Stage 2 are unable to maintain their progress during Key Stage 3 and in terms of the levels of attainment they achieve they slow down or even stall completely.

This report presents the issues arising from a small scale investigation focusing on pupils who are at risk of not converting a Level 4 in English, mathematics or science at Key Stage 2 into a Level 5 at the end of Key Stage 3.

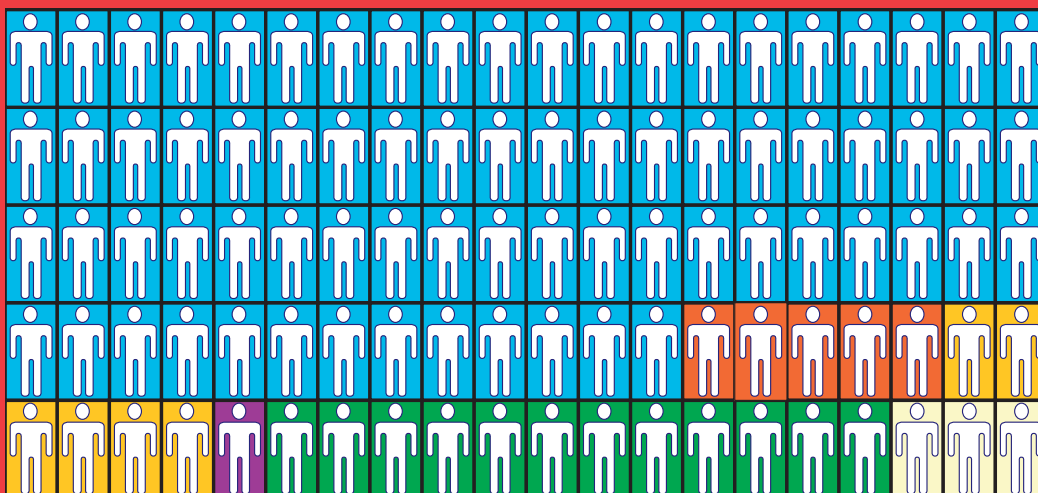
46 schools were selected on the basis of Key Stage 2 to Key Stage 3 conversion rates in 2006 (17 for English, 14 for mathematics and 15 for science). There was a reasonable balance between shire, London and unitary local authorities.

Each school was visited for up to a day by a DCSF school standards adviser. The methodology of the investigation was based on a series of detailed interviews with Year 8 and Year 9 pupils (identified by the schools as 'at risk' of not adding one level during the key stage), the headteacher and a senior leader with responsibility for pupil tracking, Year 8 and Year 9 teachers and the relevant subject leader. In addition, some samples of pupils' work and teaching plans were examined. Lessons were not observed.

The report focuses on the experiences of approximately 250 pupils in the schools visited. It is split into separate chapters on how to identify those making slow progress in English, mathematics and science. Along with common characteristics it also outlines some significant differences – particularly between boys and girls.

Based on these research findings, the report also includes practical suggestions for schools and teachers on how they can improve the performance of these pupils.

Pupil Progression Chart: KS3 English (2006)



Orange represents those pupils who entered the key stage at Level 4 but did not achieve Level 5 (national expectations) by the end of the key stage

Chapter 2: Identifying slow moving pupils in English in KS3	6
Pupil characteristics	6
Obstacles to progress in English	7
Specific issues arising	8

Chapter 2: Identifying slow moving pupils in English in KS3

The main findings from the investigation are grouped into three separate sections: the pupil characteristics, a summary of the obstacles to progress and the specific issues arising.

Pupil characteristics

Whilst not wishing to stereotype the pupils who were making less than expected progress in English in Key Stage 3, they tended to share the following characteristics:

- They were mostly boys (about three-fifths of the sample)
- The girls were described by their teachers as very quiet and unwilling to ask for help
- They were easily distracted and disorganised: one teacher described them as having “something chaotic about them”
- They would have liked some targeted support although they didn’t always know what aspects of their work they needed help with
- They were embarrassed about making mistakes in front of their peers and didn’t wish to be seen asking for help
- They wanted to work independently but lacked the self-help strategies to do so effectively
- They gave up easily, often leaving work unfinished
- They worked mostly on their own, although they preferred to work in groups
- They were engaged and applied themselves to their work when they found it interesting; otherwise they failed to see the point, describing it as “boring”
- They relished praise and reassurance
- They felt deeply frustrated at their limitations in reading and writing, had low self-esteem and did not consider themselves to be good at English, despite having attained Level 4 at the end of Key Stage 2

Other significant findings

Pupils:

- Had limited opportunities to build on their successes at Key Stage 2
- Received written feedback which they said rarely helped their learning

Teachers and senior leaders:

- Made limited use of the sequence for teaching writing (modelled, guided, independent) and tended to confuse the significance of modelled and guided writing within it
- Lacked confidence in the application of National Curriculum levels
- Rarely targeted intervention for pupils who failed to make expected progress within the key stage if they started the key stage at national expectations

Specific issues arising

Reading

“We need to be more knowledgeable about the teaching of reading.” (Subject leader)

“I don’t read at home ... reading is for school work.” (Year 8 boy)

“I get hooked – I read all the Harry Potter books and couldn’t put them down.” (Year 8 girl)

“I used to read a lot but now I don’t. If I’m going to read, I have to have a book I’m really interested in – I used to enjoy Jacqueline Wilson but not now.” (Year 9 girl)

- The majority of pupils did not regard themselves as readers. However, many of them had enjoyed a particular book or series of books by a favourite writer, although they did not know what they would read next.
- A significant proportion of pupils had enjoyed the shared experience of a class text but they regarded their own personal reading as different, citing magazines, newspapers and more “lightweight” fiction and non-fiction as their preferred choices.
- A significant number of pupils said that they would only read a book at home if it was really interesting, related to schoolwork or if there was nothing else to do.
- Some pupils expressed anxiety at being asked to read aloud.
- Whilst teachers in the majority of the schools said that they regularly used shared reading with a whole class, guided reading was planned for on a regular basis in only one of the schools visited and intermittently in only one in four.
- Many pupils said that they struggled to answer reading comprehension questions which required longer answers, even though the ‘Point, Evidence, Explain’ model was well used by teachers to support them. They often struggled to explain the effect of a text on the reader, relying on generic responses such as, “It is interesting.”

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Writing

“We teach planning until it comes out of our ears but, in the exam, they just don’t do it – it’s the panic factor.” (Subject leader)

“We did a model of planning and he hasn’t used it.” (English teacher)

“I like writing my ideas down but not planning.” (Year 9 boy)

“I struggle with big blocks of writing. I can do good little bits but ... I tend to repeat things.” (Year 9 boy)

- Teachers in all schools said that they modelled writing on a regular basis, although a significant minority understood this to mean the provision of a model or exemplar text rather than teacher demonstration of the writing process. Guided writing was taking place in two of the schools visited.

- The majority of these pupils said that basic punctuation was a problem for them. They saw punctuation as a chore, an afterthought - something to be put in after rather than during the writing process. They felt that it got in the way of their writing. Their sentence demarcation was insecure and they had little understanding of punctuation for meaning.
- Very few pupils had evidence of extended writing in their books and, where it was apparent, it was either built up over a number of lessons or closely linked to assessment tasks. Pupils' stamina for sustained writing was not developed and many had left work unfinished.
- Many of the pupils said that they disliked writing under timed conditions as they felt rushed and under pressure. Some of the boys were frustrated with the quality of their handwriting which they felt deteriorated further when writing at speed. They expressed a desire to use laptops but said that they seldom had the opportunity to do so.
- A significant minority of pupils said that they wrote letters, stories, diaries and poetry at home if they had time, although they regarded this writing as personal and would not share it with a wider audience.
- The majority of pupils regarded planning as a waste of time and some resented having to do it. Even though most teachers said that pupils had been taught how to plan, they rarely did so, especially when writing under the pressure of timed conditions. Planning in pupils' books tended to focus on content rather than structure, and planning strategies were limited to lists and spidergrams. In some schools, teachers were concerned that pupils were over dependent on writing frames.

Speaking and listening

"It's done but I wouldn't say it was done in the same way as reading and writing."
(Subject leader talking about the teaching of speaking and listening)

"It's better when you work with other people ... there's more discussion ... more ideas..."
(Year 9 boy)

"We always work alone – I just get on with my work." (Year 8 boy)

- In most of the schools visited, speaking and listening were regarded as skills to be used rather than skills to be taught. Teachers talked about assessing speaking and listening but it was explicitly taught in only one in four schools.
- In more than half of the schools, teachers said that they planned opportunities for speaking and listening, such as talk partners, small group work and role play, into the scheme of work. In one school, pupils spoke positively about a unit of work which focused entirely on speaking and listening objectives.
- Most pupils said that they welcomed the opportunity to work in small groups because they found it helpful to share each other's ideas. For the most part, however, they were expected to work on their own.
- No pupils referred to curricular targets which focused on speaking and listening.
- In one in three schools, teachers recognised the need to develop work on speaking and listening further.

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Progression

“Miss X said that my work has improved but she’s given me two sub-levels lower than I got in Year 6.” (Year 8 pupil)

“We’re working on getting more familiar with working towards levels – it’s a whole school approach.” (Subject leader)

“I think our data tracking has really helped ... we now know that we only have 5 pupils out of 96 in Year 9 that are stuck.” (Subject leader)

- In all of the schools, teachers were clear that they expected pupils entering KS3 at Level 4 to progress to at least Level 5 by the end of the key stage. In a significant number of schools however, the senior leadership team had higher expectations of progress than subject leaders and teachers.
- Teachers described these pupils as not having fully secured the skills they expect of an average Year 7 pupil on entry to secondary school. Many were concerned about the pupils’ technical accuracy in writing, an issue which was raised by many of the pupils themselves.
- There was little evidence of any analysis of reading and writing scores which would have identified those pupils who were insecure writers despite having attained Level 4 overall.

- Robust, whole school tracking systems were well developed in almost all schools, with many setting interim as well as annual and end of key stage targets and tracking pupils' progress towards them at least termly. However, in at least half of the schools, English teachers felt that they needed further support with the application of National Curriculum levels and some teachers said that the levels they entered into the school database were for writing only.

Assessment for learning (AfL)

"After an assessment, our teacher goes over what most of us are weak at – we might do a whole lesson on connectives." (Year 8 girl)

"When they just read out our levels, it doesn't really help ... it is better when the teacher talks to us about how to improve when we're writing." (Year 8 girl)

- For many pupils, marking of their work consisted of either positive or generalised and superficial comments. Many pupils did not find their teachers' written feedback helpful and few had improved their work as a result of it. When teachers did provide helpful targets for improvement, they said that they found it hard to monitor them.
- Pupils in two-thirds of the schools were aware of their current and target levels. However, in the majority of schools, they were unaware of what they needed to do to reach their target or how to improve their work in general.
- Assessing Pupils' Progress (APP) was being implemented in almost all of the schools visited although it was in its infancy in most. In some cases, the tasks were being used rather than the ongoing assessment guidelines, thus failing to exploit the full potential of these materials.
- More than a third of the schools visited had adopted Assessment for Learning (AfL) as a whole school priority although few pupils were able to comment on the impact of this. In almost half of the schools, assessment was not used to inform planning and teaching, although the use of APP was beginning to have a positive impact on this practice.
- For some schools, the adoption of AfL meant that literacy across the curriculum had ceased to be a priority. In several schools, however, senior leaders had recognised the need to revisit literacy across the whole school.

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Intervention

“English revision groups are really helpful ... you can go up after the lesson and ask a question ... I feel stupid and get embarrassed if I do this in class.” (Year 9 girl)

“I need time on my own with someone because I really struggle in English.” (Year 8 boy when asked what would help him in English)

- In two-thirds of the schools teaching assistants supported mainly less able pupils either by withdrawing them from class or by providing one-to-one support within the lesson. Several schools had dedicated teaching assistants (often HLTAs) working in the English department to deliver Secondary National Strategy programmes such as the Writing Challenge. Three schools also used older pupils as reading buddies to support younger pupils. None of the pupils interviewed were able to recall benefiting from such support, although they said they would have welcomed this.
- Three-quarters of the schools were offering booster support for Year 9 pupils, often consisting of breakfast and after school clubs, and some of the pupils interviewed were looking forward to this. One school had collapsed the Year 9 timetable for two days and another had created an extra class in Year 9.
- Only one school was offering targeted intervention for Year 8 pupils.
- Literacy Progress Units were being delivered in two-thirds of the schools visited, although in four of these schools their use was intermittent and targeted mainly at pupils entering Year 7 at level 3b or 3c.

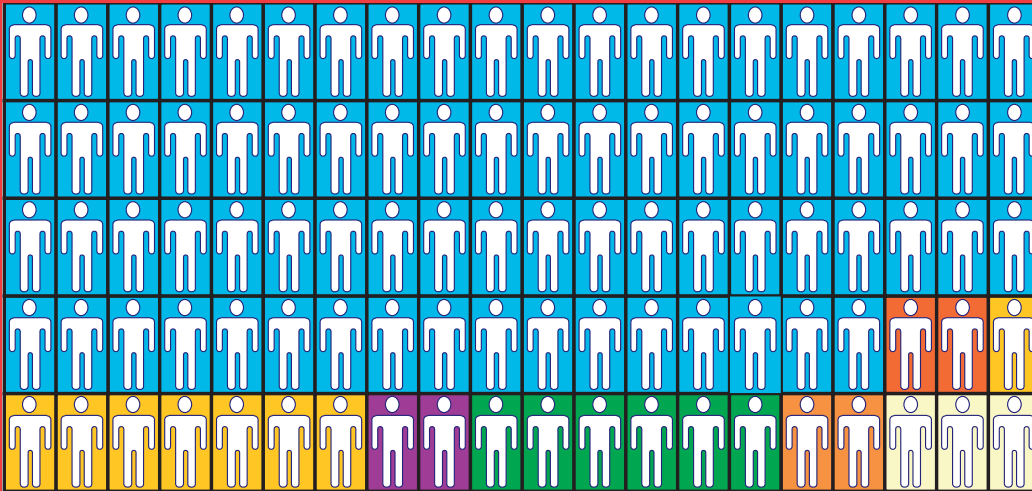
Involvement of parents and carers

“I’d like to be home tutored, but not by my mum!” (Year 8 pupil)

“My mum gets angry with my messy writing ... I think it’s the teacher’s job to help me not hers.”
(Year 8 boy)

- Pupils often said that they preferred to do their work by themselves and did not want their parents/carers to help them.
- Many schools cited low literacy levels amongst parents/carers as an issue. In one in four schools, pupils said that their parents were not really able to help them or focused too much on the more superficial aspects of their writing.
- A significant number of schools felt that their parents/carers had low expectations of their children’s academic progress, although a move towards academic review days in a third of the schools had proved popular with parents/carers and had led to a significant improvement in attendance at parents’ meetings.

Pupil Progression Chart: KS3 Maths (2006)



Orange represents those pupils who entered the key stage at Level 4 but did not achieve Level 5 (national expectations) by the end of the key stage

Chapter 3: Identifying slow moving pupils in mathematics in KS3	16
Pupil characteristics	16
Obstacles to progress in mathematics	18
Specific issues arising	20

Chapter 3: Identifying slow moving pupils in mathematics in KS3

The main findings from the investigation are grouped into three separate sections: the pupil characteristics, a summary of the obstacles to progress and the specific issues arising.

Pupil characteristics

Whilst not wishing to stereotype the pupils who were making less than expected progress in mathematics in Key Stage 3, they tended to share the following characteristics:

- They knew mathematics was important and wanted to do well
- They did not particularly enjoy mathematics and some found it boring
- They wanted to be able to get on with their work and really disliked it when poor behaviour of other pupils slowed down the pace of the lesson, or disturbed their concentration
- They often worked on their own
- They wanted to be clear about what they had to do and were then content just to get on with their work
- They liked to follow a given method
- They liked working and discussing in pairs or groups, but they rarely did this in mathematics lessons
- They enjoyed games, puzzles and more open activities and saw these as special and unusual
- They liked adult support, but had few self-help strategies
- They waited patiently with their hand up when they were stuck, but sometimes did not get noticed and more demanding pupils often got attention first
- They found it hard to identify what they needed to do to improve their mathematics, apart from work harder

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A minority of pupils who were making less than expected progress in mathematics shared these characteristics:

- They rushed their work, often making mistakes
- They were competitive and wanted to be the first to finish
- They would work if the task was straightforward, but would get distracted and might behave badly if they decided they could not do the work
- They knew they did not work hard in lessons and, if set, they rarely did homework
- They did not want to be told they had got something wrong – they were likely to give the impression that they did not care and give up
- They were concerned about how their peers viewed them – for some it was a risk to be seen to try and fail
- They were sometimes more motivated by off-task distractions than the work they were supposed to be doing
- If they finished early they were reluctant to do anything 'extra'

Obstacles to progress in mathematics

“I don’t like speaking out in lessons – but I will in a small group.” (Year 8 boy)

“I work hard sometimes. I work hard when there’s no noise.” (Year 8 boy)

“In every lesson there is a worksheet. We do worksheets, book work and copying.”
(Year 8 pupils)

“I don’t get stuck in other subjects – only maths. When I’m doing English, I can always get on with my work. If I’m not sure about a spelling, I can just have a go and still get my work done. But I can’t do that in maths. If I’m stuck I can’t do anything but wait for help. Then I don’t get anything done.” (Year 9 girl)

Pupils’ own comments, together with evidence provided by their teachers and senior leaders, suggested the following:

In number and algebra, pupils:

- Had difficulty identifying related facts from known number facts
- Viewed decimals, fractions and percentages as different and unrelated
- Were better at adding and multiplying mentally than subtracting and dividing
- Found algebra difficult and did not expect ever to be able to understand it

When using and applying mathematics, pupils:

- Often focused exclusively on the answer when doing mathematics
- Had difficulty with, and were sometimes resistant to, explaining their methods
- Struggled to remember mathematical vocabulary and rarely used mathematical words in their lessons or in their written work
- Had difficulty seeing the relationships and connections (e.g. fractions, decimals and percentages) in mathematics

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Other significant findings

Pupils:

- Rarely worked in pairs or groups
- Lacked opportunities for talk with their teacher and peers during mathematics lessons
- Viewed their exercise books as the records of questions completed rather than a record of key ideas, skills and knowledge
- Very rarely had any curricular targets to focus improvement in mathematics

Teachers:

- Saw the more open-ended approaches associated with teaching *using and applying mathematics* as generating more problems of poor behaviour
- Used mainly test outcomes to assess pupils' attainment
- Targeted interventions at many of the pupils, but mainly in the second half of Year 9

Specific issues arising

Number and algebra

“I never understood percentages and then in this lesson the teacher got people to explain their methods at the front – and there were lots of different ones. That really helped. I can do it now.” (Year 9 girl)

“I have never understood algebra.” (Year 9 boy)

- Pupils in about half the schools visited lacked flexibility with number. In these schools pupils were often not able to use the relationship between operations to find simple related facts, nor were they able to find answers to sets of related calculations.
- Division was a weakness for most of the pupils, both mentally and using written methods.
- In over half the schools pupils viewed decimals, fractions and percentages as different and unrelated. They tended to have an intuitive feel for the equivalences for halves and quarters, but little awareness of links between other sets of fractions, decimals and percentages. Pupils were often confident with estimating positions of decimal numbers on a number line, but were much weaker with identifying or positioning fractions.
- Few pupils were confident with mental calculation. Often pupils would assume they could not do a calculation mentally, although when challenged many could do more than they thought. Many pupils said they preferred to make jottings. Mental calculation with addition was a strength for most, although often with a limited range of strategies. In a little over a third of the schools, pupils’ mental calculation with addition and multiplication was far better than for subtraction and division.
- Pupils in more than two-thirds of the schools said they found algebra difficult. They often said they could not do algebra, and struggled to identify any specific aspects of algebra they had worked on. Many pupils were unfamiliar with the vocabulary of algebra and saw this as a barrier, for example they were unsure of words like *expression*, *equation*, *variable*. In discussions with pupils there was often a sense that they do not expect to be able to understand algebra.

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Using and applying mathematics

“Open-ended activities are difficult with these pupils. They keep asking what they should do next. They want to be told what to do.” (Year 8 teacher)

“I’m reluctant to try some activities, such as card sorts and games with this group as I find their behaviour very challenging.” (Year 8 teacher)

“These pupils are often unable to make connections and have a limited range of methods.” (Subject leader)

“The teacher gives us new words but I don’t remember them.” (Year 8 girl)

“I always strive to get pupils to explore two or more approaches or methods in my teaching. This helps them to make sense of what they are working on.” (Year 8 teacher)

“Currently pupils do mathematics. They don’t think mathematics. That’s our challenge.” (Subject leader)

- Many of the targeted pupils focused almost exclusively on the answer in mathematics. A few pupils, often boys, recorded only the answers to questions and problems in their books. Where pupils did record method, this was frequently identical for all of the questions attempted from a set exercise. There was little evidence either through discussion with pupils, or from their books, of pupils exploring different approaches to solve problems or of using different methods to find the answer to a question.
- Teachers said that many of the targeted pupils had difficulty with, and could be resistant to, explaining their methods (mostly expressed in the context of mental calculation). They often responded by saying ‘*I just know*’.
- In more than half of the schools, pupils had significant weaknesses with their use and understanding of mathematical vocabulary. Some pupils said that they were often introduced to new words in lessons, but they had difficulty remembering them and had few opportunities to say and use the words for themselves. Pupils in discussion were often vague and imprecise when talking about their work. Very few of the pupils’ books included any written use of key mathematical vocabulary.
- Many teachers said that they were aware that using and applying mathematics had insufficient focus in their teaching. Some felt that using and applying approaches were a risk to behaviour management. Others felt constrained by the content they needed to get through in the textbook.

Teaching and learning

“It helps us to learn if we can talk to each other but mostly we work by ourselves.” (Year 9 girl)

“We wish we could do more talking about the work, more fun games, more activities on the white board, more use of laptops and more rhymes to help us learn.” (Year 8 and 9 pupils)

“There is a tendency to teach algorithms because teachers are worried about getting through the syllabus in time.” (Subject leader)

“If they can’t do something it can quickly become a behavioural issue.” (Year 8 teacher)

“Sometimes she tries to trick us by showing wrong answers. I really like that.” (Year 9 girl)

- When talking about mathematics, all pupils described structured lessons. Oral and mental starters seemed to have lost their purpose in about a quarter of the schools. In these schools, pupils talked about mostly doing mental tests at the start of lessons or other individual written activities. Pupils often said that lessons ended with them marking and checking their work.
- In more than two-thirds of the schools visited, most of the work in pupils’ mathematics books comprised of routine exercises of closed and similar questions. Pupils often described their mathematics lessons as working from exercises in the textbook or from the board. Many of the targeted pupils struggled to remember what previous work was about.
- For most pupils, their exercise books were records of questions completed rather than a record of key ideas, skills and knowledge. Very few of the pupils wrote their own personal notes to help them reflect on the key elements of learning in lessons.
- In more than two-thirds of the schools visited, pupils did very little open-ended mathematics work. Many pupils said they enjoyed games, puzzles and open-ended activities, but they saw these as special and unusual. They also said that activities on the interactive whiteboard made lessons more interesting, but they did not get much opportunity to use ICT for themselves.
- Pupils in over half the schools said they liked working in pairs or groups, but that they rarely got the chance in mathematics lessons. One-third of the schools were beginning to develop paired and group work because teachers recognised the importance of talk in supporting pupils’ learning.
- Most of the targeted pupils had few self-help strategies. They tended to be dependent on teacher support when they got stuck, but often did not get noticed. Some pupils seemed to encounter problems a lot in mathematics lessons and felt that they wasted too much time waiting for help. These pupils viewed this as something special to mathematics lessons, as they rarely felt they could not get on in other subjects.
- Teachers in a quarter of the schools said that the targeted pupils did better in class than in tests. Several pupils said they had difficulty understanding what the mathematics test questions meant, and some were put off by ‘wordy’ questions.

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- In over half the schools, teachers said that the targeted pupils had difficulty in remembering what they did in previous lessons. In these schools, teachers often spent longer than they planned going over work.
- In about a quarter of the schools a significant proportion of the target pupils had been moved down to lower mathematics sets or teaching groups. Pupils said they had been moved because of their behaviour or because of their ability. A few pupils had been moved down twice.
- Many of the Year 9 pupils were targeted for intervention in mathematics. Teachers talked about planned use of booster lessons and additional lessons during school holidays. Many more of the Year 9 pupils received mathematics intervention support than the Year 8 pupils.
- Just under two-thirds of the schools had experienced difficulties with specialist staffing shortages in mathematics. Some pupils in these schools said they had had many different mathematics teachers since the beginning of Key Stage 3, which they found unsettling.

Assessment and tracking

“I know I can do much better in mathematics.” (Year 9 boy)

“There’s no point in working hard because I’m never going to be moved up a set.” (Year 8 boy)

“I’m below my target. I don’t know why.” (Year 9 boy)

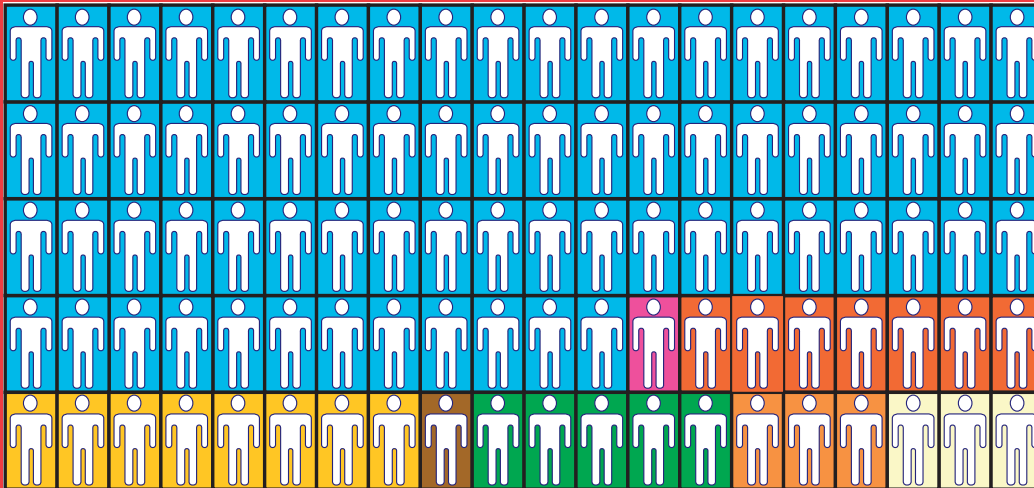
“Pupils who behave well can fall through the net. We tend to notice pupils who have behavioural issues rather than those who are making slower than expected progress.”
(Subject leader)

- About a third of the schools were routinely sharing learning objectives with pupils in lessons, but very few pupils felt they had any involvement in self-assessment. Pupils often had difficulty identifying their strengths and weaknesses in mathematics.
- Almost all the schools tracked pupils’ progress by sub-levels, usually each term. Most teachers based their sub-level judgements exclusively on tests. Only a quarter of the schools said they used focused ongoing assessment. Few teachers said they were secure in making level or sub-level judgements in mathematics drawn from a range of evidence, but about one-third of schools were developing teachers’ awareness of levels.
- Over half of the schools visited were developing question level analysis of tests to identify curricular targets. Very few pupils had curricular targets for mathematics, although the majority knew their target level for the end of Key Stage 3. Very few pupils could talk about the important areas of mathematics they would need to understand to be able to achieve their target. They said they needed to work harder to achieve their target.

Involvement of parents and carers

- Two-thirds of the schools had difficulty in getting the parents/carers of the targeted pupils to attend curriculum consultations and other sessions in school. All the schools prioritised involvement of parents/carers and planned events focused on the progress of their child, for example academic review days, and many offered evening sessions on how parents/carers can help their child.
- Many pupils said that their parents/carers felt well-informed about their progress through written reports, sharing of target levels and individual letters about concerns. Many of the mathematics teachers talked about contacting a parent/carer by telephone or letter if they had concerns about a pupil’s behaviour or progress.

Pupil Progression Chart: KS3 Science (2006)



Orange represents those pupils who entered the key stage at Level 4 but did not achieve Level 5 (national expectations) by the end of the key stage

Chapter 4: Identifying slow moving pupils in science in KS3	26
Pupil characteristics	26
Obstacles to progress in science	27
Specific issues arising	29

Chapter 4: Identifying slow moving pupils in science in KS3

The main findings from the investigation are grouped into three separate sections: the pupil characteristics, a summary of the obstacles to progress and the specific issues arising.

Pupil characteristics

Whilst not wishing to stereotype the pupils who were making less than expected progress in science in Key Stage 3, they tended to share the following characteristics:

- They wanted to learn, especially in Year 8. However, significant dissatisfaction had set in by Year 9, leading to some lack of engagement or disruptive behaviour
- They were motivated by lessons that were active and had practical elements
- Many were very quiet and lacked confidence, especially in Year 8, and just wanted to keep their heads down
- They were often enthusiastic in class but could be lazy when it came to homework and, possibly as a result, written work was often incomplete
- They lacked any self-help strategies, other than asking the teacher
- They were conservative in their approach to learning and would not take risks
- They needed thinking time
- They liked working in groups, but typically this only happened in practical work
- They had a short term memory for scientific information

More specifically:

- They found science hard
- They saw few links between the work they did in English and mathematics with their science work
- They lacked the skills of analysis and evaluation, preferring to concentrate on description
- Even though some had good speaking and listening skills, they found reading difficult and were frustrated by their inability to commit their ideas to paper

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- They were better at understanding a question when it was read out rather than when they had to read it themselves (there was a tendency when answering test questions not to read the preamble, especially if lengthy, and go straight to the line for the answer, possibly only reading the sentence above).
- They did not like working from textbooks, particularly copying, but did this quite frequently
- They also copied from the board frequently
- They were rarely given choices in lessons

Obstacles to progress in science

Pupils' own comments, taken alongside evidence provided by their teachers and senior leaders, suggested the following:

In scientific enquiry, pupils:

- Found practical work enjoyable, although it often involved following detailed instructions or recipes
- Experienced a relatively small proportion of investigative work at the beginning of the key stage, but this level often increased in Year 9
- Were not aware of any progression in the skills required in investigative work
- Were often uncertain about what needed to be done to improve their attainment in scientific enquiry

In relation to subject content, pupils:

- Experienced obstacles to progress across most of the Key Stage 3 science topics
- Struggled to remember and use the correct scientific terminology, especially that associated with investigative work (e.g. variable)
- Found that the application of scientific ideas and knowledge in unfamiliar contexts presented a very real challenge

In relation to literacy and numeracy, pupils:

- Did not feel that their problems with reading and writing were given sufficient consideration, particularly at the beginning of Key Stage 2
- Found reading science information and test questions particularly difficult
- Experienced a very limited range of writing styles and much of the work required short answers involving no more than one sentence
- Rarely used extended writing and, when they did, it was often descriptive rather than explanatory
- Often found the interpretation of graphical evidence problematic

Other significant findings

Pupils:

- Rarely worked in groups (except when performing practical work) and plenary sessions were not common features of science lessons
- Spent a relatively high proportion of their time using worksheets which made only limited demands
- Saw copying from textbooks or the blackboard as a regular feature of lessons
- Spent little time on homework

Teachers:

- Agreed that attainment in science at Key Stage 2 was not always given sufficient consideration
- Often had lower expectations of pupil progress than those of the senior leadership team
- Only planned intervention in Years 7 and 8 on rare occasions
- Agreed that written feedback often did not provide guidance on appropriate next steps
- Acknowledged that the use of curricular targets to aid progression was limited, as was peer and self-assessment

Specific issues arising

Scientific enquiry

“I like practicals such as heating things up or watching a hydrogen balloon exploding. It helps me to learn and remember.” (Year 8 pupil)

“The pupils talk about ‘practicals’ and not enquiries or investigations.” (Year 9 teacher)

“Practical work is alright but all you do is follow the recipe.” (Year 8 pupil)

- Almost all the pupils said they found the practical work the most interesting part of their science lessons. From their descriptions and evidence obtained from the work scrutiny, it was apparent that investigative work was integrated into their scheme of work in about half the schools visited, and more so in Year 9 than in Year 8. However, Year 9 pupils often commented on the shortage of practical work, albeit that there was a higher proportion of investigative work, compared to their experience in Year 8.
- In their practical work pupils often followed quite detailed instructions or recipes and infrequently were asked to make decisions themselves about how to plan and perform an investigation. Overall, pupils were rarely asked to analyse and evaluate their findings for themselves; most often teachers did this through class discussion.

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- Although progression ‘ladders’ were being used in about a third of the schools visited, most of the pupils interviewed were not really clear what they had to do to improve their attainment in attainment target 1 (Sc1). Whilst over one-third of schools had focused attention on improving graphical skills, in only about one school in five were the underpinning investigative skills being taught in a systematic and progressive way through the key stage.
- The ideas and evidence aspect of Sc1 was rarely apparent in the pupils’ notebooks.

Subject Content (Sc2, Sc3 and Sc4)

“In the topic on Forces we watched a video of part of the Italian Job – it really helped understand about levers.” (Year 9 pupil)

“Why do we need to know about pushing chairs in and out?” (Year 9 pupil talking about a topic on forces)

“Solids are hard so the particles in a solid must be hard.” (Year 8 pupil)

“Plants are boring!” (Year 8 pupil)

- The pupils talked about the science work they were currently engaged in and were readily able to identify areas of difficulty, ranging from cells and food chains in Sc2, to elements, compounds and mixtures and patterns of behaviour in Sc3, to electrical circuits, light and forces in Sc4. This would suggest that there are obstacles to understanding across most topics for this target group of pupils. This may also explain why teachers in over one-third of the schools had difficulty in pinpointing the specific weaknesses the pupils exhibited. From the pupils’ descriptions of their difficulties, it appeared that a common obstacle was that the content was often not presented in a range of relevant contexts.
- Common difficulties highlighted by the pupils included gaining familiarity with scientific terminology (e.g. chromatography, distillation, etc), as well as more generic terms relating to investigation work (e.g. variable, dependent, etc). Over one-third of the pupils specifically mentioned difficulties they had with formulae and word equations.
- The pupils interviewed were clearly struggling to acquire the conceptual understanding which characterises a Level 5 as opposed to a Level 4. Most pupils claimed to be put off when questions were set in unfamiliar contexts and could not see how the knowledge they did have was relevant to the question.

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Literacy and numeracy

“The pupils conducted an internet search in pairs about *Useful microbes and their effect on food*. They enjoyed this but most ended up cutting and pasting as they found it difficult to rewrite the information in their own words.” (Year 8 teacher)

“Pupils often start writing a test answer without fully reading the question – if there is a lot of text, they go to where an answer is required, read the line above and then write their answer.” (Year 9 teacher)

“If I explain the question the pupils can respond well enough verbally, but writing answers to written questions on their own is another matter.” (Year 8 teacher)

“If I see a graph I just turn over to next question; I know I can’t do it!” (Year 9 pupil)

- Problems with literacy were identified by teachers in all the schools as a factor in limiting the progress of the target group of pupils. However, in almost three-quarters of the schools visited science departments did not take account of pupils’ prior levels of attainment in English at Key Stage 2. In only about one-fifth of schools were whole-school approaches to literacy appearing to have a real impact on the teaching and learning within the science department.
- More than half the pupils interviewed said they had difficulty in reading science information and, particularly, test questions. For many, the extent of the introduction and lead up to a question were a significant barrier to providing a good answer.

- Teachers indicated that certain words proved to be real barriers to the pupils' understanding of exactly what was required in questions, for example, words such as 'distinguish' and 'justify' were often not understood.
- Evidence from exercise books suggested that the pupils used a very limited range of writing styles. Much of the written work examined comprised short answers of no more than one sentence, often written on worksheets. Extended writing, when it was done, was almost exclusively descriptive in nature, as in the description of an experiment, for example. Explanations seldom featured in the pupils' writing. Examples of creative writing or the use of writing frames to support extended writing for scientific investigations or other pieces of writing were very rare.
- In contrast, teachers and pupils generally did not cite a weakness in numeracy as a factor in limiting progress in science. A possible exception, however, was difficulties the pupils experienced in interpreting graphs with the required levels of precision and accuracy.

Lesson structure

"I have two science teachers. One talks all the time and gets us to copy things out of the book – this doesn't help me learn. The other lets us discuss things and demonstrates experiments – this really helps me understand." (Year 8 pupil)

"Teachers will accept less if behaviour is good." (Year 9 pupil)

"The only homework we get is to 'finish off'." (Year 8 pupil)

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- Pupils described their lessons and features such as starters, the sharing of objectives and engagement in the main activity, either practical or written, were common features. However, group work (outside practical work) and plenaries were less commonly described.
- The use of ICT in science lessons was common in about half the schools visited. In these schools typically interactive whiteboards existed in almost every room/laboratory and were used by teachers and, to a lesser extent, by pupils, for example, in PowerPoint presentations. Where ICT was being used pupils were generally very positive about its impact on their motivation and learning.
- Extensive use of relatively low demand worksheets was apparent in about one-quarter of the schools and in these schools evidence from exercise books and the pupils would indicate that a very limited range of teaching and learning styles were being employed.
- Copying from textbooks or from the board was mentioned as a regular feature of their lessons by the pupils in over six out of every ten schools. Some of the pupils saw this activity as a strategy by the teacher to limit disruptive behaviour. In this context, pupils in one-quarter of the schools cited poor behaviour in lessons as an obstacle to their progress.
- Pupils in almost all the schools visited said that they spent very little time on homework and that it almost always involved finishing off work not finished in class or revising for end of unit tests.

Target setting and tracking pupil progress

“We use a number of different systems for target setting. We need to be careful though as the process can result in some pupils being given a target below what they achieved at the end of KS2! When this happens I change the target.” (Senior leader)

“I know what my science target is in terms of levels and I know how well I am doing from my marks on assessment tasks.” (Year 8 pupil)

- In over eight out of every ten schools effective systems were in place to set targets for the pupils, both at the end of each year and at the end of the key stage, and to track and report on pupil progress during the key stage. A wide variety of systems and approaches were being used, drawing on a range of statistical and contextual information. The analysis of the progress of different pupil groups was less well established and in a minority of schools progression from Key Stage 2 science attainment was not particularly evident as it was not a key parameter in the target setting process.
- The expectations that all pupils should progress during the key stage was greatest in the senior leadership teams (SLTs) but noticeably less for some teachers. SLTs usually talked about one-and-a-half or two levels of improvement during the key stage for all pupils, but this was often downgraded to ‘half a level for less able pupils’ by some of the class teachers.
- Typically pupil progress was being reported on a termly basis, usually in terms of national curriculum sub-levels, and in over half the schools these reports formed the basis of discussions with pupils and their parents/carers at academic review meetings. However, a common weakness was that the evidence used at teacher/departmental level to report on progress was limited and specific action to respond to identified underperformance was only a common feature in Year 9.
- Pupils knew their own current level of work and the progress they were making in about seven out of every ten schools, with this being a more common feature in Year 9 than in Year 8.

Intervention

“We do need to decide how best to intervene in Year 8.” (Subject leader)

“Teachers are aware of individual pupils’ strengths and weaknesses but there is no agreed procedure for action.” (Subject leader)

- Planned intervention in Year 9 was a feature of all the schools visited. This ranged from schools (about a quarter of the sample) who re-grouped pupils after a ‘mock’ national test in October so that particular groups of pupils could be targeted for intervention, to the majority who provided ‘booster’ classes, both within and outside school hours. Many schools had evaluated the outcomes of this work and could produce evidence of its very positive impact.

- Detailed analysis of past performance on Key Stage 3 tests was a feature in just over half the schools visited. In other schools, any analysis undertaken identified general areas of weakness but fell short of the identification of the strengths and weaknesses of particular groups of pupils. A direct impact of this analysis on the science scheme of work was only found in a small minority of schools.
- Examples of intervention in Years 7 and 8, apart from those made by individual teachers, were very rare indeed. Subject leaders freely admitted that they focused in Key Stage 3 almost exclusively on Year 9 pupils. One school, however, had introduced an accelerated programme in Years 7 & 8 which placed an increased challenge on the pupils and highlighted the importance of pupil debate and discussion in lessons.

Assessment for learning (AfL)

“I know my target and my level at the moment. I’m not really sure what to do to make my Level 4 into a Level 5 – I suppose I need to listen more closely and making sure work is completed.” (Year 9 pupil)

“The teacher writes comments on my work – these are some from my book ‘Complete all the work set in the lesson’ and ‘Use a ruler to draw tables’.” (Year 8 pupil)

- The practice of objective-led lessons was well established in all the schools visited. However, providing pupils with specific curricular targets was evident in less than one-quarter of schools. In these schools progression ‘ladders’ were being used as a basis for identifying appropriate next steps.
- Whilst the marking of pupils’ work was nearly always up-to-date, little guidance was provided to the pupils on how to improve. Teacher comments tended to be targeted on presentational aspects of the work or general exhortations to ‘work harder’ or ‘listen more carefully’.
- Pupils in only about one-quarter of schools were able to provide examples of their involvement in peer or self-assessment.

Involvement of parents and carers

“Feedback from tutors shows that more parents are asking questions about their child’s progress in terms of the level they are achieving.” (Subject Leader)

- Schools generally found the parents/carers of this target group of pupils difficult to engage. Attendance rates at subject report evenings for all parents/carers in the schools visited varied from about 30% – 60% only, although those schools that had adopted academic review days reported much higher attendance, in the order of 80% or higher.
- The pupils claimed they received little help from their parents/carers, citing a lack of knowledge and understanding as the main reason. Where help was described it was usually in terms of ‘reading the work through’ or help with revision for tests.

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Chapter 5:

Taking action: overall

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Chapter 5: Taking action: across the whole school

This chapter highlights possible action that can be taken to address some of the key issues that cut across all three subject areas.

Issue 1: Tracking, intervention and focused feedback

Key concerns

- These pupils rarely received support at the point at which they started to fall behind – much of the intervention was provided through the use of 'boosters' at the end of the key stage
- These pupils very rarely had any curricular targets to focus improvement or to aid progression

What do pupils need if they are to address this issue?

- Clear understanding of what is expected in the short, medium and long term
- Challenging targets that they understand and that are regularly set and reviewed
- Immediate feedback, oral or written, that is constructive and clearly indicates next steps for improvement
- Opportunities to reflect on learning and time to ask questions
- Targeted early intervention which builds on areas for development and the purpose of which is clear to the pupil
- Regular opportunities to undertake self and peer assessment against criteria

What do teachers need if they are to address this issue?

- Clear expectations from the school leadership
- Support to develop skills needed to set and assess appropriate short and longer-term targets
- Training to ensure all pupils know how to reach their targets through clear next steps
- Time to reflect on and review targets in order to set appropriate new challenges to pupils
- Strategies to engage pupils effectively in their learning in order to develop opportunities to improve peer and self evaluation
- Opportunities to provide oral feedback in lessons
- Clear understanding of the use of tracking to plan for future progress
- Strategies for early identification of those pupils needing intervention
- Planned and focused intervention opportunities from Year 7

What support can headteachers/senior leadership teams provide?

- Develop and maintain high expectations in a culture and atmosphere of achievement
- Provide whole school CPD on the use of target setting and the part that self and peer assessment can play
- Develop the use of curricular targets which are appropriately set and monitored
- Ensure consistency of practice across the school
- Provide support for the moderation of judgements that underpin the tracking process
- Challenge departments to identify early those pupils who are in danger of not achieving the targets set
- Ensure departments respond to information provided by tracking to plan for appropriate and early intervention for those not making expected progress

Issue 2: Developing self-help strategies

Key concern

- Pupils wanted to work independently but lacked the self help strategies to do so effectively

What do pupils need if they are to address this issue?

- Encouragement to take risks and not to fear failure
- Further opportunities to work in groups or in pairs, sometimes with pupils of differing abilities
- Personal learning objectives which they understand
- Transferable practical skills which they can deploy across subject boundaries

What do teachers need if they are to address this issue?

- Guidance on how to create appropriate and engaging learning environments which support individual or small group work
- Flexible approaches to assessment
- Opportunities for paired or group work highlighted in the scheme of work
- Support for this development from the senior leadership team as part of a whole-school approach

What support can headteachers/senior leadership teams provide?

- A school-wide approach to Assessment for Learning, in which the teachers know where their pupils are in their learning and what they need to do to improve
- A coherent and collective understanding of what “self-help strategies” actually mean in practice within the school
- A culture within the school that encourages greater flexibility and creativity

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Chapter 6:

Taking action in English

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Chapter 6: Taking action in English

This chapter highlights possible action that can be taken to address some of the key issues in English.

Issue 3: Engaging and extending pupils as readers

Key concern

- These pupils had little idea about choosing texts which were likely to engage or extend them

What do pupils need if they are to address this issue?

- Opportunities to discuss their reading habits and reading 'diet'
- Opportunities to consider what kind of reader they are – perhaps through the use of the progression maps
- Advice regarding the types of texts that are likely to stimulate and extend them as readers, e.g. "If you liked text X why not try text Y?"
- Recommendations for wider reading across the curriculum, e.g. in history, science, design and technology
- Opportunities to read regularly for enjoyment in a comfortable environment
- An awareness that all reading counts – not just fiction
- Guidance on making independent choices of texts and a willingness to take risks in selection

What do teachers need if they are to address this issue?

- CPD to secure the skills of modelling reading – particularly modelling what good readers do
- Support to secure the practice of guided reading in English and in other curriculum areas
- The inclusion of a wide range of texts in the schemes of work in English and in other curriculum areas
- Up-to-date knowledge of interesting and engaging texts for young people

What support can librarians/subject leaders provide?

- The establishment of a reading culture across the whole school amongst pupils, staff and parents
- Easy access to a wide range of up-to-date, engaging and appropriate texts for young people, e.g. a book trolley in classrooms
- Ways of organising fiction texts in the library which encourage readers to extend themselves as readers, e.g. organising texts by genres
- Book weeks, visits by authors, sponsored reading activities and reading awards, e.g. the 'Newshire Book Award'

Issue 4: Teaching punctuation for meaning

Key concern:

- The majority of these pupils said that basic punctuation was a problem for them. They saw punctuation as a chore, an afterthought – something to be put in after rather than during the writing process. They felt that it got in the way of their writing. Their sentence demarcation was insecure and they had little understanding of punctuation for meaning

What do pupils need if they are to address this issue?

- Opportunities to use self and peer assessment to review punctuation
- An understanding of what specific punctuation skills are needed to move from Level 4 to Level 5
- Modelling by the teacher which demonstrates the link between punctuation, meaning and effect on the reader
- Guided writing opportunities to secure understanding of basic sentence demarcation before the end of Key Stage 3

What do teachers need if they are to address this issue?

- A range of interactive strategies to de-mystify punctuation, e.g. using sound effects for punctuation marks, etc
- CPD to secure the skills of modelling, particularly in the context of using punctuation for clarifying meaning
- Guidance on the choice of engaging and appropriate texts which support the learning objective(s)
- Use of 'punctuation fans' to encourage pupils to make choices about punctuation
- Practice in the use of questioning to tease out the effect of particular punctuation choices in a piece of text

What support can subject leaders provide?

- A whole school punctuation audit with layered targets designed to secure basic punctuation for all pupils before the end of Key Stage 3
- A language environment in every classroom which supports pupils' understanding and use of punctuation, e.g. 'working walls' and punctuation posters
- An absolute insistence that work is not marked with generalised comments such as, "watch your punctuation"

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Chapter 7:

Taking action in mathematics

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Chapter 7: Taking action in mathematics

This chapter highlights possible action that can be taken to address some of the key issues in mathematics.

Issue 5: Experiencing more open approaches and activities

Key concern

- These pupils need more opportunities to work collaboratively and do more open activities, but teachers see these open-ended approaches as generating problems of poor behaviour

What do pupils need if they are to address this issue?

- Explicit teaching and support to help them to get started and develop mathematics through open activities
- A range of opportunities to work on open approaches and activities, including some that are short episodes within a lesson developing to longer exploration over one or two lessons
- Clarity about the learning outcomes for open activities and approaches, both for mathematical content and for the skills of using and applying
- Modelling by the teacher and other pupils of different ways to approach a problem or mathematical enquiry
- More paired work to discuss and find different ways to get an answer or to explore different approaches to solve a problem

What do teachers need if they are to address this issue?

- Time and opportunities to work with colleagues, including those from other subject departments, to explore effective strategies for teaching and learning mathematics through collaborative work
- Ideas and strategies for getting pupils to work on mathematics in pairs
- Time to work with colleagues to integrate more open approaches and activities into the scheme of work in mathematics

What support can subject leaders provide?

- Encouragement and support for teachers to take risks to improve pupils' learning
- Opportunities for teachers to work together in the classroom to experiment with open approaches and focused paired work
- Open approaches and activities that are appropriately challenging and help pupils make sense of key mathematical ideas so teachers are convinced of the value for pupils' learning and achievement
- Opportunities to explore teaching strategies in departmental meetings, drawing on a range of relevant resources

Issue 6: Understanding relationships and connections

Key concern

- These pupils rarely see the relationships and connections (e.g. between fractions, decimals and percentages) and this makes it hard for them to develop understanding and make sense of mathematics

What do pupils need if they are to address this issue?

- Explicit teaching to help them see and use the relationships and links in mathematics, e.g. seeing how to use the answer to one calculation to derive the answer to a related but harder calculation
- Time to talk about and explore the links in related mathematical ideas
- Opportunities for concept mapping to review previous learning for a topic or an area of mathematics and explore the links, e.g. in pairs or small groups mapping out previous learning about fractions
- Opportunities to work on tasks that make links and relationships explicit, e.g. matching and sorting activities

What do teachers need if they are to address this issue?

- Time to explore links and relationships in mathematics and discuss the significance of developing understanding of these connections to secure pupils' progress towards Level 5 and beyond in mathematics
- Support to plan for explicit teaching to help pupils join mathematical ideas together and see the bigger picture, e.g. number lines to see the equivalence between fractions, decimals and percentages
- References in planning to important opportunities for helping pupils make links within and across topics in mathematics

What support can subject leaders provide?

- Time in departmental meetings to discuss and explore significant links and relationships in mathematics alongside ideas and strategies for teaching
- Time to plan specific lessons collaboratively
- Encouragement and support for teachers to try out ideas in the classroom and share the outcomes and reflections with other colleagues
- Opportunities for teachers to work together in the classroom to experiment with different ways to help pupils see the bigger picture in mathematics and explore some of the big ideas, e.g. ideas of equivalence

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Chapter 8:

Taking action in science

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Chapter 8: Taking action in science

This chapter highlights possible action that can be taken to address some of the key issues in science.

Issue 7: Providing more opportunities for investigative work

Key concerns

- These pupils experienced a relatively small proportion of investigative work at the beginning of the key stage, although the proportion increased in Year 9
- These pupils were not aware of any progression in the skills required in their investigative work

What do pupils need if they are to address this issue?

- Opportunities to build on their primary school experiences of self-reliance and independent learning in their work on part and full investigations
- To be aware of the greater risks associated with specialised equipment and materials (carry out simple risk assessments)
- To have opportunities to demonstrate their skills and understanding to their peers
- To be clear about what they need to do to progress from one level to the next in the planning, observation, analysis and evaluation strands of scientific investigations
- To appreciate that scientific investigation is central to an overall understanding of science

What do teachers need if they are to address this issue?

- Appreciate what pupils achieve and how they work on investigatory activities at primary school and develop strategies to build on this
- To help pupils to be aware of the risks associated with specialised equipment and materials (carry out simple risk assessments)
- To have a range of strategies that allows pupils to demonstrate what they understand and can do
- To ensure that pupils know what they need to do to improve their work through the provision of specific curriculum targets to move them to the next national curriculum level
- To make clear to pupils the centrality of scientific investigations in science

What support can subject leaders provide?

- Clarity about what pupils achieve, and are expected to do, at primary school and identification of ways in which to build on this, e.g. arrange well targeted visits to primary schools
- Opportunities for pupils to make their own risk assessments identified in the schemes of work
- Opportunities identified in the schemes of work for pupils to demonstrate what they understand and can do in their investigation work
- Guidance on specific skill acquisition in part and full investigations included in the schemes of work, with emphasis on the centrality of investigations to science both in school and the wider world
- A range of science resources which promote the investigatory aspect of science and are effectively deployed

Issue 8: Providing more opportunities for a wider range of writing

Key concerns

- These pupils experienced a very limited range of writing styles and much of the work required short answers involving no more than one sentence
- These pupils rarely used extended writing and, when they did, it was often descriptive rather than explanatory

What do pupils need if they are to address this issue?

- Opportunities to discuss their ideas and understanding of science in pairs and small groups
- Opportunities to express their ideas and understanding in a variety of different written forms which require justification and explanation
- Participation in peer assessment in order to improve the clarity of their writing
- Understanding of what they need to do to improve their skills of explanation, analysis and evaluation

What do teachers need if they are to address this issue?

- Provide frequent opportunities for pupils to discuss their ideas and understanding of science in pairs and small groups
- Provide frequent opportunities for pupils to express their ideas and understanding in a variety of different written forms requiring justification and explanation
- Encourage pupils to assess the work of their peers
- Provide feedback to pupils so that they understand precisely what they need to do to improve their performance and progress towards the next national curriculum level

What support can subject leaders provide?

- Opportunities for pupils to discuss their ideas and understanding of science in pairs and small groups are built into schemes of work at appropriate times
- Opportunities for pupils to express their ideas and understanding in a variety of different forms are built into schemes of work at appropriate times
- Appropriate resources for staff to carry out these actions and provide CPD on the effective use of peer assessment
- Guidance and linked CPD for staff on what pupils need to do to improve and move from one national curriculum level to the next
- A departmental focus on the quality of staff feedback on the pupils' writing

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