Mathematics Survey Visits

Generic grade descriptors and supplementary subject-specific guidance for inspectors on making judgements during visits to schools

Subject feedback letters, following survey visits, normally contain separate judgements on:

- achievement
- quality of teaching
- quality of the curriculum
- effectiveness of leadership and management
- overall effectiveness in the subject.

In coming to these judgements, inspectors will use the relevant criteria and grade descriptors from the 2009 Section 5 evaluation schedule (up-dated in September 2010), as they can be applied to individual subjects. These descriptors are set out in the left-hand columns in the following pages. Alongside them (for achievement, teaching, the curriculum and leadership and management) are supplementary, subject-specific descriptors which provide additional guidance for mathematics. These descriptors should be applied in a way which is appropriate to the age of pupils involved. Except where otherwise indicated, descriptors are intended to used on a 'best fit' basis.

It is important to note that this guidance is intended only to inform the judgements made by specialist inspectors carrying out subject survey visits. It is not for use on Section 5 whole-school inspections.

Achievement in Mathematics

	Generic	Supplementary subject-specific
1	Outstanding Achievement is likely to be outstanding when: ■ attainment is above average or high and learning and progress are outstanding or ■ attainment is high and learning and progress are good	Pupils understand important concepts and are able to make connections within mathematics. They develop a broad range of skills in using and applying mathematics. They show exceptional independence and take the initiative in solving problems in a wide range of contexts, including the new or unusual. They think for themselves, and are prepared to persevere when faced with challenges, showing a confidence that they will succeed. They embrace the value of learning from mistakes and false starts. When investigating mathematically, they reason, generalise and make sense of solutions. Pupils show high levels of fluency in performing written and mental calculations and mathematical techniques. They use mathematical language and symbols accurately in their work and in discussing their ideas with others. They develop a sense of passion and commitment to the subject.
2	Good Achievement is likely to be good when: ■ attainment is above average and learning and progress are good or ■ attainment is average and learning and progress are good or outstanding. or ■ attainment is low but there is convincing evidence that outstanding learning and progress are helping pupils' attainment to improve strongly. On rare occasions learning and progress may be good, but outstanding for some groups of pupils and improving overall.	Pupils understand some important concepts and can make some connections within mathematics. They develop a range of skills in using and applying mathematics. They are able to work independently, and sometimes take the initiative in solving problems in various contexts. Many show a developing ability to think for themselves, and are willing to try when faced with challenges. They are willing to learn from mistakes and false starts. When investigating mathematically, most are able to reason, generalise, and make sense of solutions. Pupils are generally fluent in performing written and mental calculations and mathematical techniques. Their use of mathematical language and symbols is mostly accurate when presenting their work and in discussing their ideas with others. They enjoy the subject and can explain its value.
3	Satisfactory Achievement is likely to be satisfactory when: ■ attainment is average, above average or high and learning and progress are satisfactory or ■ attainment is low but improving strongly and learning and progress are good. Or, there is convincing evidence that learning and progress are satisfactory but improving securely and quickly.	Pupils use techniques correctly, often through emulating the teacher's methods, but their understanding of the underpinning concepts is insecure. Pupils develop some skills in using and applying mathematics. They are able to solve routine problems set in various contexts. Pupils are generally dependent on procedural prompts from examples, resources or staff and tend to seek help rather than persevere when faced with challenges. Many lack confidence and like to avoid making mistakes. When investigating mathematically, they can sometimes reason and make simple generalisations. Pupils are reasonably accurate in performing written and mental calculations and mathematical techniques, though sometimes slowed by hazy recall of number facts or over reliance on calculators. They often use mathematical language and symbols imprecisely. Most are ambivalent about the subject but recognise its value.
4	Inadequate Achievement is likely to be inadequate if either: ■ learning and progress are inadequate or ■ attainment is low and shows little sign of improvement, and learning and progress are no better than satisfactory with little or no evidence of improvement.	Pupils' lack of understanding impedes progress. Pupils develop insufficient skills in using and applying mathematics. They have difficulty in solving problems other than the most routine. The accuracy of their mental and written work is affected by weak knowledge of number facts and incorrect use of mathematical techniques. They give up too readily, or wait for others to provide answers. Their lack interest in the subject is reflected in the low quality and limited quantity of their work.

Quality of teaching in Mathematics

1	Teaching in the subject is at least good and much is outstanding, with the result that the pupils are making exceptional progress. It is highly effective in inspiring pupils and ensuring that they learn extremely well. Excellent subject knowledge is applied consistently to challenge and inspire pupils. Resources, including new technology, make a marked contribution to the quality of learning, as does the precisely targeted support provided by other adults. Teachers and other adults are acutely aware of their pupils' capabilities and of their prior learning and understanding, and plan very effectively to build on these. Marking and dialogue between teachers, other adults and pupils are consistently of a very high quality. Pupils understand in detail how to improve their work and are consistently supported in doing so. Teachers systematically and effectively check pupils' understanding throughout lessons, anticipating where they may need to intervene and doing so with striking impact on the quality of learning.	Teaching is rooted in the development of all pupils' conceptual understanding of important concepts and progression within the lesson and over time. It enables pupils to make connections between topics and see the 'big picture'. Teaching nurtures mathematical independence, allows time for thinking and encourages discussion. Problem solving, discussion and investigation are seen as integral to learning mathematics. Constant assessment of each pupil's understanding through questioning, listening and observing enables fine tuning of teaching. Barriers to learning and potential misconceptions are anticipated and overcome, with errors providing fruitful points for discussion. Teachers communicate high expectations, enthusiasm and passion about their subject to pupils. They have a high level of confidence and expertise both in terms of their specialist knowledge and their understanding of effective learning in the subject. As a result, they use a very wide range of teaching strategies to stimulate all pupils' active participation in their learning together with innovative and imaginative resources, including practical activities and, where appropriate, the outdoor environment. Teachers exploit links between mathematics and other subjects and with mathematics beyond the classroom. Marking distinguishes well between simple errors and misunderstanding and tailors insightful feedback accordingly.
2	Teaching in the subject is consistently effective in ensuring that pupils are motivated and engaged. The great majority of teaching is securing good progress and learning. Teachers generally have strong subject knowledge which enthuses and challenges most pupils and contributes to their good progress. Good and imaginative use is made of resources, including new technology to enhance learning. Other adults' support is well focused and makes a significant contribution to the quality of learning. As a result of good assessment procedures, teachers and other adults plan well to meet the needs of all pupils. Pupils are provided with detailed feedback, both orally and through marking. They know how well they have done and can discuss what they need to do to sustain good progress. Teachers listen to, observe and question groups of pupils during lessons in order to reshape tasks and explanations to improve learning.	Teaching develops pupils' understanding of important concepts as well as their proficiency in techniques and recall of knowledge, equipping pupils to work independently. It helps pupils to see that topics are connected and form a 'big picture'. Many opportunities are provided for problem solving in various contexts, discussion and investigation, although these are not always integral to learning. Teachers focus on pupils' understanding when questioning, listening and observing. Barriers to learning and misconceptions are tackled well. Teachers have a clear understanding of the value of their subject which they communicate effectively to pupils, often with enthusiasm. They have a good level of specialist expertise which they use well in planning and teaching their subject. As a result, they use an appropriate range of resources and teaching strategies, including practical activities and, where appropriate, the outdoor environment. They make some links between mathematics and other subjects and with mathematics beyond the classroom. Marking identifies errors and misunderstanding and helps pupils to overcome difficulties.
3	Teaching in the subject may be good in some respects and there are no endemic inadequacies. Pupils show interest in their work and are making progress that is broadly in line with their capabilities. Teachers' subject knowledge is secure. Adequate use is made of a range of resources, including new technology, to support learning. Support provided by other adults is effectively deployed. Teaching ensures that pupils are generally engaged by their work and little time is wasted. Regular and accurate assessment informs planning, which generally meets the needs of all groups of pupils. Pupils are informed about their progress and how to improve through marking and dialogue with adults. Teachers monitor pupils' work during lessons, pick up general misconceptions and adjust their plans accordingly to support learning.	Teaching focuses primarily on developing pupils' skills in mastering techniques and answering routine questions rather than understanding the underlying concepts. Accurate explanations give a piecemeal approach to learning a topic so that pupils are not helped to see the 'big picture'. Opportunities for problem solving are generally restricted to routine cases or are uneven, for example problems occur at the end of exercises so that not all pupils meet them. Pupils have some opportunities to investigate and discuss. Questioning tends to be closed rather than probing. Some barriers to learning and misconceptions are identified and tackled. Teachers understand the value of their subject which they communicate to pupils. They have adequate subject expertise which they use in their planning and teaching. As a result, they use a range of resources and teaching strategies, though one approach may dominate, for example, exposition by the teacher and practice by the pupils. They occasionally make links between mathematics and other subjects and with mathematics beyond the classroom. Marking is generally accurate and sometimes helps pupils to overcome difficulties.
4	■ Expectations in the subject are inappropriate. Too many lessons are barely satisfactory or are inadequate and teaching fails to promote the pupils' learning, progress or enjoyment. or ■ Assessment in the subject takes too little account of the pupils' prior learning or their understanding of tasks and is not used effectively to help them improve.	Teachers are not able to engage pupils' interest in the subject and do not monitor their progress adequately. Weaknesses and gaps in the teacher's knowledge of mathematics or how pupils learn the subject hamper lesson planning, the choice of resources, or the quality of teachers' explanations so that, as a result, pupils make too little progress. Pupils have too few opportunities for problem solving, investigation or discussion. A narrow view of the subject isolates it from other subjects and the outside world. Marking is too irregular, inaccurate or unhelpful to pupils.

The curriculum in Mathematics

1	The curriculum in the subject provides memorable experiences and rich opportunities for high-quality learning and wider personal development. The subject curriculum may be at the forefront of successful, innovative design. A curriculum with overall breadth and balance provides pupils with their full entitlement and is customised to meet the changing needs of individuals and groups. The subject's contribution to relevant cross-curricular themes including, as appropriate, literacy, numeracy and ICT, is mainly outstanding. As a result, all groups of pupils benefit from a highly coherent and relevant curriculum which promotes outstanding outcomes.	The imaginative and stimulating subject curriculum is skilfully designed to match to the full range of pupils' needs and interests and to ensure highly effective continuity and progression in their learning and in the qualification pathways they follow, including into further study. Problem solving and investigative approaches are central to learning for all pupils. Clear guidance for teachers on activities and approaches that promote conceptual understanding, including the use of ICT, ensures all pupils benefit and experience breadth and depth in learning across the mathematics curriculum. Intervention and support are focused and finely tuned to pupils' individual needs so that they make rapid progress. Excellent links are forged with other agencies and the wider community to provide a wide range of enhancement and enrichment activities to promote pupils' learning and engagement with the subject.
2	The curriculum in the subject provides well-organised, imaginative and effective opportunities for learning and a broad range of experiences which contribute well to the pupils' development. The curriculum is adjusted effectively to meet the needs of most groups and a range of pupils with highly specific needs. The subject makes a good contribution to relevant cross-curricular themes including, as appropriate, literacy, numeracy and ICT. Enrichment opportunities in the subject are varied, have a high take-up and are much enjoyed.	The curriculum is broad, balanced and well informed by current initiatives in the subject. It is designed to match to a range of pupils' needs and interests, and ensure effective continuity and progression in their learning in the subject and in the qualification pathways they follow, including into further study. All pupils have opportunities to solve problems and investigate although the extent to which these are integral to their learning may vary. Guidance for teachers on activities and approaches that promote conceptual understanding, including the use of ICT, supports pupils' experiences across the breadth and depth of the mathematics curriculum. Intervention and support are focused on pupils' individual needs so that they make good progress. Good links are forged with other agencies and the wider community to provide a range of enhancement and enrichment activities to promote pupils' learning and their engagement with the subject.
3	The curriculum in the subject is adequately matched to pupils' needs, interests and aspirations and provides adequate preparation for the next stage of their lives, whatever their starting points. Provision for potentially vulnerable pupils is satisfactory. The subject's contribution to cross-curricular themes including, as appropriate, literacy, numeracy and ICT, is at least satisfactory.	The curriculum provides adequate coverage of the mathematical content but pays less or uneven attention to the development of the key process skills. It provides for a range of pupils' needs and interests and ensures adequate progression in their learning. They acquire mathematical qualifications, but the choice and timing of these may not suit pupils' individual needs or promote further study. All pupils have some opportunities to solve problems and investigate. Guidance for teachers on activities and approaches that promote conceptual understanding, including the use of ICT, is limited or not implemented consistently so that pupils' experiences across the mathematics curriculum vary. Intervention and support lead to some improvements in progress or confidence in answering test questions. Some links are forged with other agencies and the wider community, although the range of activity provided to enhance and enrich pupils' interest and learning may be quite limited.
4	The curriculum has significant shortcomings in meeting the needs of pupils, or particular groups of pupils, and makes insufficient contribution to their learning, enjoyment or development.	The curriculum does not ensure pupils' entitlement to the subject, for instance in using and applying mathematics, and does not secure progression in their learning. Too many pupils do not attain a relevant mathematical qualification or follow pathways that adversely affect their future opportunities, for example stopping studying mathematics after passing GCSE early at grade C. There is little by way of enhancement or enrichment activity in the subject.

Effectiveness of leadership and management in Mathematics

1	Subject and senior leaders and managers are conspicuously successful in establishing a strong sense of purpose which involves work towards meeting or sustaining ambitious targets in the subject for all pupils. Morale is very high and belief in success runs through all staff involved with the subject. Rigorous and extensive monitoring, searching analysis and self-challenge lead to exceptionally well-focused plans for the subject. Actions taken are implemented with precision and managed thoroughly. As a result, the quality of teaching in the subject is at least good and leaders and managers at all levels are taking highly effective steps to drive up the quality of teaching still further. Consequently, achievement in the subject for all pupils is at least good.	Leadership is informed by a high level of subject knowledge, subject-specific pedagogy and vision. There is a strong track record of insightful innovation which is carefully evaluated. Subject reviews, self-evaluation and improvement planning are well-informed by current best practice in mathematics education. Subject leadership inspires confidence and whole-hearted commitment from pupils and colleagues. There are effective strategies to delegate subject responsibilities where appropriate and to share good practice and secure high quality professional development in the subject. Outstanding support and guidance on teaching and the curriculum is provided for the teachers, including any non-specialists and the less experienced. The subject is at the cutting edge of initiatives within the school.
2	Subject and senior leaders and managers consistently communicate high expectations to staff about securing improvement in the subject. They galvanise the enthusiasm of staff and channel their efforts to good effect. Leaders and managers routinely make good use of a range of rigorous monitoring activities relating to teaching, other provision and outcomes. They have an accurate picture and understanding of strengths and weaknesses in the subject. Planning is founded on robust evidence and good-quality data. It is tackling key areas of weakness, including those in teaching, systematically and building on areas of strength. As a result, teaching is at least satisfactory and improving. Target-setting is realistic and challenging. Consequently, achievement in the subject is generally good, or there is substantial evidence that it is improving strongly.	Leadership is well informed by current developments in mathematics education. Subject reviews, self-evaluation and improvement planning are clearly focused on raising attainment and improving the provision for the subject. There is a shared common purpose amongst those involved in teaching the subject with good opportunities to share practice and access subject training. Appropriate support and guidance on teaching and the curriculum is provided for the teachers. The subject engages with wider whole-school priorities effectively.
3	Subject and senior leaders and managers are motivated to seek further improvement and are effective in focusing efforts on priorities in the subject. They monitor accurately the progress of all pupils and the quality of teaching and learning. Self evaluation is broadly accurate. Target-setting in the subject is based on accurate assessment information but is only adequately challenging. Suitable plans are in place aimed at improving areas of weakness in the subject and effective steps are being taken to secure high-quality teaching. Expectations are sufficiently high to bring about outcomes which are broadly satisfactory and improving or, if lower, there is substantial evidence that they are improving strongly.	Leadership is aware of current developments in the mathematics education. Subject reviews, self-evaluation and improvement planning reflect a sound understanding of the strengths and priorities for improvement. There is some sharing of good practice, with modest access to subject-specific professional development. Support and guidance on teaching and the curriculum is provided informally or on request rather than aiming to develop systematically the practice of all teachers.
4	■ Subject and senior leaders and managers are not taking effective steps to embed their ambition for the subject. or ■ Target-setting in the subject is not used effectively to raise expectations and improve outcomes. or ■ Subject and senior leaders and managers do not drive and secure improvement. or ■ Subject and senior leaders and managers are not taking effective steps to secure satisfactory and better teaching.	Leadership is not well-informed about current initiatives in mathematics education. Key statutory requirements for the subject are not met. Self-evaluation is weak so that leaders do not have an accurate view of the quality of provision and outcomes. Opportunities for professional development in the subject are limited and, as a result, some staff lack the confidence and expertise to deliver it effectively.

Overall effectiveness in Mathematics

Outstanding (1)	Overall effectiveness in the subject is likely to be outstanding when: Achievement in the subject is outstanding, or achievement is good and outstanding leadership and management underpin the capacity for sustained improvement in the subject. At least one, of teaching or the curriculum in the subject, is outstanding, and neither is less than good.
Good (2)	Overall effectiveness in the subject is likely to be good when: Achievement in the subject is good, and good leadership and management provide secure evidence of capacity for sustained improvement in the subject. In exceptional circumstances, leadership and management may be satisfactory. At least one, of teaching or the curriculum in the subject, is good, and neither is less than satisfactory.
Satisfactory (3)	Overall effectiveness in the subject is likely to be satisfactory when: Achievement in the subject is at least satisfactory, and satisfactory leadership and management ensure adequate capacity for improvement in the subject. Teaching and the curriculum in the subject are at least satisfactory.
Inadequate (4)	Overall effectiveness in the subject is likely to be inadequate if any of the following are inadequate: ■ Achievement in the subject ■ Capacity for improvement, as evidenced by inadequate leadership and management of the subject ■ Teaching or the curriculum in the subject