

## **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:

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

In coming to these judgements, inspectors will use the relevant criteria and grade descriptors from the 2012 Section 5 evaluation schedule as they can be applied to individual subjects. Key elements of these descriptors are set out in the left-hand columns in the following pages though inspectors may refer to the whole section 5 evaluation schedule where appropriate. 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 be 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.

## Grade descriptors:<sup>1</sup> achievement of pupils in mathematics

	Generic	Supplementary subject-specific
<b>1</b>	<p><b>Outstanding</b></p> <p>Almost all pupils, including, where applicable, disabled pupils and those with special educational needs, are making rapid and sustained progress in the subject over time given their starting points. They learn exceptionally well and as a result acquire knowledge quickly and in depth, including in the sixth form and areas of learning in the Early Years Foundation Stage. They develop and apply a wide range of skills to great effect, including reading, writing, communication and mathematical skills that will ensure they are exceptionally well prepared for the next stage in their education, training or employment. The standards of attainment of almost all groups of pupils are likely to be at least in line with national averages for all pupils with many above average. In exceptional circumstances, where standards of attainment of any group of pupils are below those of all pupils nationally, the gap is closing dramatically over a period of time.</p>	<p>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.</p>
<b>2</b>	<p><b>Good</b></p> <p>Pupils are making better progress than all pupils nationally in the subject given their starting points. Groups of pupils, including disabled pupils and those with special educational needs, are also making better progress than similar groups of pupils nationally. Pupils acquire knowledge quickly and are secure in their understanding of the subject. They develop and apply a range of skills well, including reading, writing, communication and mathematical skills that will ensure they are well prepared for the next stage in their education, training or employment. The standards of attainment of the large majority of groups of pupils are likely to be at least in line with national averages for all pupils. Where standards of any group of pupils are below those of all pupils nationally, the gaps are closing. In exceptional circumstances, where attainment is low overall, it is improving at a faster rate than nationally over a sustained period.</p>	<p>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.</p>
<b>3</b>	<p><b>Satisfactory</b></p> <p>Pupils are progressing at least as well in the subject as all pupils nationally given their starting points. Groups of pupils, including disabled pupils and those with special educational needs, are also making progress in line with similar groups of pupils nationally. Pupils generally learn well in the subject, with no major weaknesses. They acquire the knowledge, understanding and skills, including those in reading, writing, communication and mathematics that will ensure they are prepared adequately for the next stage in their education, training or employment. The standards of attainment of the majority of groups of pupils are likely to be in line with national averages for all pupils. Where standards of groups of pupils are below those of all pupils nationally, the gaps are closing overall. In exceptional circumstances, where attainment is low overall, it is improving over a sustained period.</p>	<p>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.</p>
<b>4</b>	<p><b>Inadequate</b></p> <p>Achievement in the subject is likely to be inadequate if any of the following apply.</p> <ul style="list-style-type: none"> <li>■ Pupils' learning and progress, or the learning and</li> </ul>	<p>Pupils' lack of understanding impedes progress. Although they can carry out taught techniques, their learning over time is fragmented and lacks adequate breadth and depth. Pupils develop insufficient skills in using and applying mathematics. They have difficulty in solving problems other</p>

<sup>1</sup> Grade descriptors are not to be used as a checklist but should be applied adopting a 'best fit' approach.

	<p>progress of particular groups, is consistently below those of all pupils nationally given their starting point.</p> <ul style="list-style-type: none"> <li>■ Learning and progress in any key stage, including the sixth form, lead to underachievement.</li> <li>■ The learning, quality of work and progress of disabled pupils and those with special educational needs show that this group is underachieving.</li> <li>■ Pupils' communication skills, including in reading and writing and proficiency in mathematics overall, or those of particular groups, are not sufficient for the next stage of education or training.</li> <li>■ Attainment is consistently low showing little, fragile or inconsistent improvement, or is in decline.</li> <li>■ There are wide gaps in attainment and in learning and progress between different groups of pupils and of all pupils nationally that are showing little sign of closing or are widening.</li> </ul>	<p>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.</p>
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### Grade descriptors:<sup>2</sup> the quality of teaching in mathematics<sup>3</sup>

	<b>Generic</b>	<b>Supplementary subject-specific</b>
<b>1</b>	<p><b>Outstanding</b></p> <p>Much of the teaching in the subject is outstanding and never less than consistently good. As a result, almost all pupils are making rapid and sustained progress. All teachers have consistently high expectations of all pupils. Drawing on excellent subject knowledge, teachers plan astutely and set challenging tasks based on systematic, accurate assessment of pupils' prior skills, knowledge and understanding. They use well judged and often imaginative teaching strategies that, together with sharply focused and timely support and intervention, match individual needs accurately. Consequently, pupils learn exceptionally well. Teaching promotes pupils' high levels of resilience, confidence and independence when they tackle challenging activities. Teachers systematically and effectively check pupils' understanding throughout lessons, anticipating where they may need to intervene and doing so with notable impact on the quality of learning. Time is used very well and every opportunity is taken to successfully develop crucial skills, including being able to use their literacy and numeracy skills. Appropriate and regular homework contributes very well to pupils' learning. Marking and constructive feedback from teachers and pupils are frequent and of a consistently high quality, leading to high levels of engagement and interest.</p>	<p>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.</p>
<b>2</b>	<p><b>Good</b></p> <p>As a result of teaching that is mainly good, with examples of outstanding teaching, most pupils and groups of pupils, including disabled pupils and those who have special educational needs, are achieving well in the subject over time. Teachers have high expectations of all pupils. Teachers use their well developed subject knowledge and their accurate assessment of pupils' prior skills, knowledge and understanding to plan effectively and set challenging tasks. They use effective teaching strategies that, together with appropriately targeted support and intervention, match most pupils' individual needs so that pupils learn well. Teaching generally promotes pupils' resilience, confidence and independence when tackling challenging activities.</p>	<p>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</p>

<sup>2</sup> Grade descriptors are not to be used as a checklist but should be applied adopting a 'best fit' approach.

<sup>3</sup> These grade descriptors describe the quality of teaching in the subject taking account of evidence over time. While they include some characteristics of individual lessons, they are not designed to be used to judge individual lessons.

	<p>Teachers regularly listen astutely to, carefully observe and skilfully question groups of pupils and individuals during lessons in order to reshape tasks and explanations to improve learning. Teaching consistently deepens pupils' knowledge and understanding and teaches them a range of skills including literacy and numeracy skills. Appropriate and regular homework contributes well to pupils' learning. Teachers assess pupils' progress regularly and accurately and discuss assessments with them so that pupils know how well they have done and what they need to do to improve.</p>	<p>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.</p>
<p><b>3</b></p>	<p><b>Satisfactory</b></p> <p>Teaching results in most pupils, and groups of pupils, currently in the school making progress in the subject broadly in line with that made by pupils nationally with similar starting points. There is likely to be some good teaching and there are no endemic inadequacies across year groups or for particular groups of pupils. Teachers' expectations enable most pupils to work hard and achieve satisfactorily and encourage them to make progress. Due attention is often given to the careful assessment of pupils' learning but this is not always conducted rigorously enough and may result in some unnecessary repetition of work for pupils and tasks being planned and set that do not fully challenge. Teachers monitor pupils' work during lessons, picking up any general misconceptions and adjust their plans accordingly to support learning. These adaptations are usually successful but occasionally are not timely or relevant and this slows learning for some pupils. Teaching strategies ensure that the individual needs of pupils are usually met. Teachers carefully deploy any available additional support and set appropriate homework and these contribute reasonably well to the quality of learning for pupils, including disabled pupils and those who have special educational needs. Pupils are informed about the progress they are making and how to improve further through marking and dialogue with adults that is usually timely and encouraging. This approach ensures that most pupils want to work hard and improve.</p>	<p>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.</p>
<p><b>4</b></p>	<p><b>Inadequate</b></p> <p>Teaching in the subject is likely to be inadequate where any of the following apply.</p> <ul style="list-style-type: none"> <li>■ As a result of weak teaching, pupils or groups of pupils currently in the school are making inadequate progress.</li> <li>■ Teachers do not have sufficiently high expectations and teaching over time fails to excite, enthuse, engage or motivate particular groups of pupils, including those who have special educational needs and/or disabilities.</li> <li>■ Pupils cannot communicate, read, write or use mathematics as well as they should, as appropriate, in the subject.</li> <li>■ Learning activities are not sufficiently well matched to the needs of pupils so that they make inadequate progress.</li> </ul>	<p>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. Teaching focuses on pupils replicating techniques, and presents mathematics as a disparate set of skills and knowledge, resulting in a lack of adequate breadth and depth. 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.</p>

## Grade descriptors: the curriculum in mathematics<sup>4</sup>

	Generic <sup>5</sup>	Supplementary subject-specific
1	<p><b>Outstanding</b></p> <p>The curriculum in the subject provides highly positive, memorable experiences and rich opportunities for high quality learning, has a very positive impact on pupils' behaviour and, where appropriate, their safety, and contributes very well to pupils' achievement and, where appropriate, to their spiritual, moral, social and cultural development.</p>	<p>The imaginative and stimulating mathematics 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.</p>
2	<p><b>Good</b></p> <p>The curriculum in the subject provides well organised, imaginative and effective opportunities for learning for all groups of pupils including disabled pupils and those who have special educational needs, promotes positive behaviour and, where appropriate, their safety, and provides a broad range of experiences that contribute well to the pupils' achievement and, where appropriate, to their spiritual, moral, social and cultural development.</p>	<p>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.</p>
3	<p><b>Satisfactory</b></p> <p>The curriculum in the subject is generally matched to pupils' needs, interests and aspirations and provides adequate preparation for the next stage of their lives, whatever their starting points.</p>	<p>The curriculum provides adequate coverage of the mathematical content but pays less or uneven attention to the development of investigative and problem-solving 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.</p>
4	<p><b>Inadequate</b></p> <p>The curriculum in the subject fails to meet the needs of pupils or particular groups of pupils.</p>	<p>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.</p>

<sup>4</sup> The generic grade descriptors are drawn from the leadership and management section of *The evaluation schedule for the inspection of schools and academies, January 2012*

## Grade descriptors:<sup>6</sup> quality of leadership and management of mathematics

	Generic	Supplementary subject-specific
<b>1</b>	<p><b>Outstanding</b></p> <p>The pursuit of excellence in all activities relating to the subject is demonstrated by an uncompromising and highly successful drive to strongly improve achievement, or maintain the highest levels of achievement, for all pupils including disabled pupils and those who have special educational needs, over a sustained period of time. Actions are based on a deep and accurate understanding of performance in the subject. Key leaders focus relentlessly on improving teaching and learning, resulting in teaching that is likely to be outstanding and at least consistently good.</p>	<p>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.</p>
<b>2</b>	<p><b>Good</b></p> <p>Key leaders and managers consistently communicate high expectations and ambition in the subject. They model good practice and demonstrably work to monitor, improve and support teaching, encouraging the enthusiasm of staff and channelling their efforts and skills to good effect. As a result, teaching is improving and is at least satisfactory, with much that is good. Planned actions based on accurate self-evaluation to overcome weaknesses have been concerted and effective. As a result, achievement has improved or consolidated previous good performance.</p>	<p>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.</p>
<b>3</b>	<p><b>Satisfactory</b></p> <p>Key leaders and managers provide a concerted approach to improvement in the subject. Planned actions by leaders and managers have improved the quality of teaching so that very little is inadequate. Capacity to secure improvements in the subject is demonstrated by a trend of sustained improvement in achievement although a few significant weaknesses remain.</p>	<p>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.</p>
<b>4</b>	<p><b>Inadequate</b></p> <p>Leadership and management of the subject are likely to be inadequate if any of the following apply.</p> <ul style="list-style-type: none"> <li>■ Capacity for further improvement is limited because current leaders and managers have been ineffective in securing essential improvements.</li> <li>■ Leaders and managers are not taking effective steps to secure satisfactory and better teaching for all groups of pupils, including disabled pupils and those who have special educational needs.</li> <li>■ Despite remedying a few small areas of weakness, perhaps recently, improvements are fragile, too slow or depend on external support.</li> </ul>	<p>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</p>

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## Grade descriptors:<sup>7</sup> the overall effectiveness of mathematics

<p><b>Outstanding</b> (1)</p>	<p>Practice in the subject consistently reflects the highest aspirations for pupils and expectations of staff. Best practice is spread effectively in a drive for continuous improvement. Teaching in the subject is likely to be outstanding and together with a rich curriculum, which is highly relevant to pupils' needs, it contributes to outstanding learning and achievement or, in exceptional circumstances, achievement that is good and rapidly improving. Thoughtful and wide-ranging promotion of the pupils' spiritual, moral, social and cultural development in the subject enables them to thrive. Consequently, pupils and groups of pupils have excellent experiences in the subject, ensuring they are very well equipped for the next stage of their education, training or employment.</p>
<p><b>Good</b> (2)</p>	<p>Effective action is taken in the subject to enable most pupils to reach their potential. Pupils benefit from teaching that is at least good. This promotes very positive attitudes to learning and ensures that achievement in the subject is at least good. Leadership and management of the subject play a significant role in this and are good overall. Deliberate and effective action is taken to promote the pupils' spiritual, moral, social and cultural development. A positive climate for learning exists and pupils and groups of pupils have highly positive experiences in the subject so that they are well prepared for the next stage in their education, training or employment.</p>
<p><b>Satisfactory</b> (3)</p>	<p>Achievement, the quality of teaching and learning and leadership and management of the subject are all likely to be at least satisfactory with some significant good practice. Reasonable steps are taken to promote pupils' spiritual, moral, social and cultural development. Pupils and groups of pupils have a generally positive experience in the subject and are not disadvantaged as they move to the next stage of their education, training or employment.</p>
<p><b>Inadequate</b> (4)</p>	<p>Overall effectiveness in the subject is likely to be inadequate if any of the following apply.</p> <ul style="list-style-type: none"> <li>■ Achievement is inadequate.</li> <li>■ The quality of teaching is inadequate.</li> <li>■ The curriculum is inadequate.</li> <li>■ Leadership and management are inadequate.</li> <li>■ There are important weaknesses in the promotion of pupils' spiritual, moral, social and cultural development resulting in a poor climate for learning in the subject where pupils or groups of pupils are unable to thrive.</li> </ul>

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