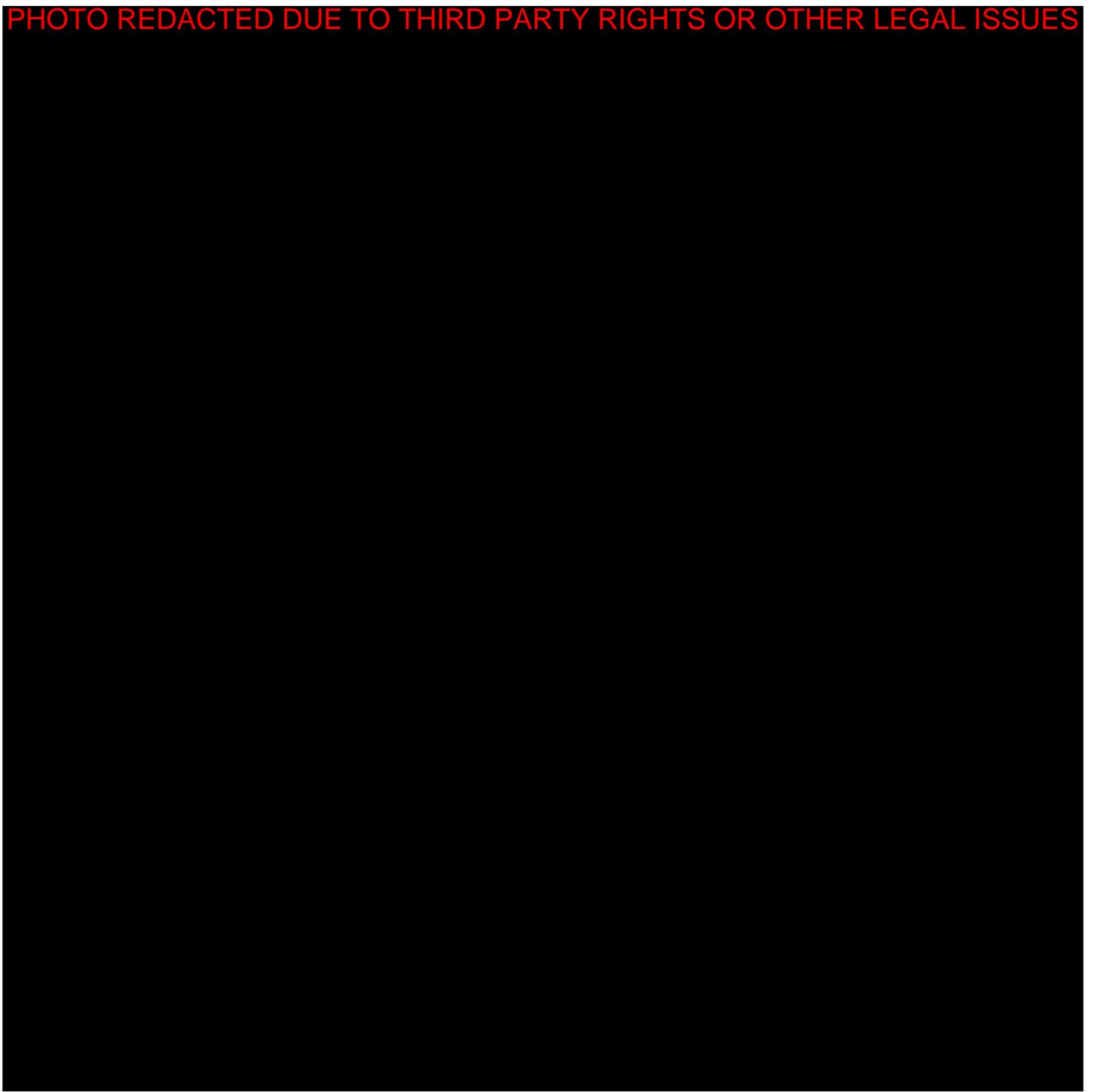


Using data, improving schools

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Foreword

Christine Gilbert, HMCI



The intelligent use of data affects the work of all professionals involved in education. There can be no going back to the days when decisions were made on hunches and anecdotal information. But we have to present and explain data in ways which inspire trust and confidence, and lead to appropriate choices and judgements being made. Using data, improving schools is intended to help everyone involved in school improvement achieve this goal.

The booklet also acts as a reminder that whilst data cannot be ignored, we must recognise its limitations. There is no straightforward, formulaic link, for example, from contextualised or any other form of data to the judgements inspectors make during inspections. And data must never be used – by schools or inspectors – to furnish excuses for poor attainment or slow progress.

That said, data, and in particular contextual value added data, can indicate issues in relation to a school's performance which on first sight may not be apparent. It can help recognise where pupils make good progress from low starting points, for example. Schools are right to take pride in this. And at the other end of the scale, data can also indicate where performance is not as good as it should be. Data can point to schools which are clearly succeeding in helping pupils secure good levels of attainment, but where questions must be raised about the rate of progress made by some or all of the pupils. Data can point to where further enquiry and action are needed.

So data are valuable. But data are only numbers on a page, or a spreadsheet on a screen. They only measure what has been tested. And people often only test what they feel they can measure. The challenge for schools, and for inspectors, is to understand the data available and get behind the figures to explore the strengths and weaknesses they indicate. Data, if used intelligently in this way, can be an essential tool as we work together to raise standards in schools and so improve the lives of the children attending them.

Christine Gilbert

Introduction

School data are valuable. They are used by many people and organisations for a variety of different reasons. For example, school data can be used by:

- parents and carers to help them make important decisions with their children – appropriate and timely data can help parents, carers and children to understand what is going on in a school and, if necessary, to ask probing questions about its performance
- headteachers, teachers and governors to assess pupils' progress and to inform management decisions
- local authorities to monitor the performance of the schools under their control, to plan for improvement and to allocate resources
- Ofsted inspectors to make a judgement about a school's effectiveness and capacity to improve.

Undoubtedly useful, data do have their limitations. Data do not tell us why schools are performing as they are or how they will be in the future. What data can do is offer great opportunities for schools to explore strengths and weaknesses.

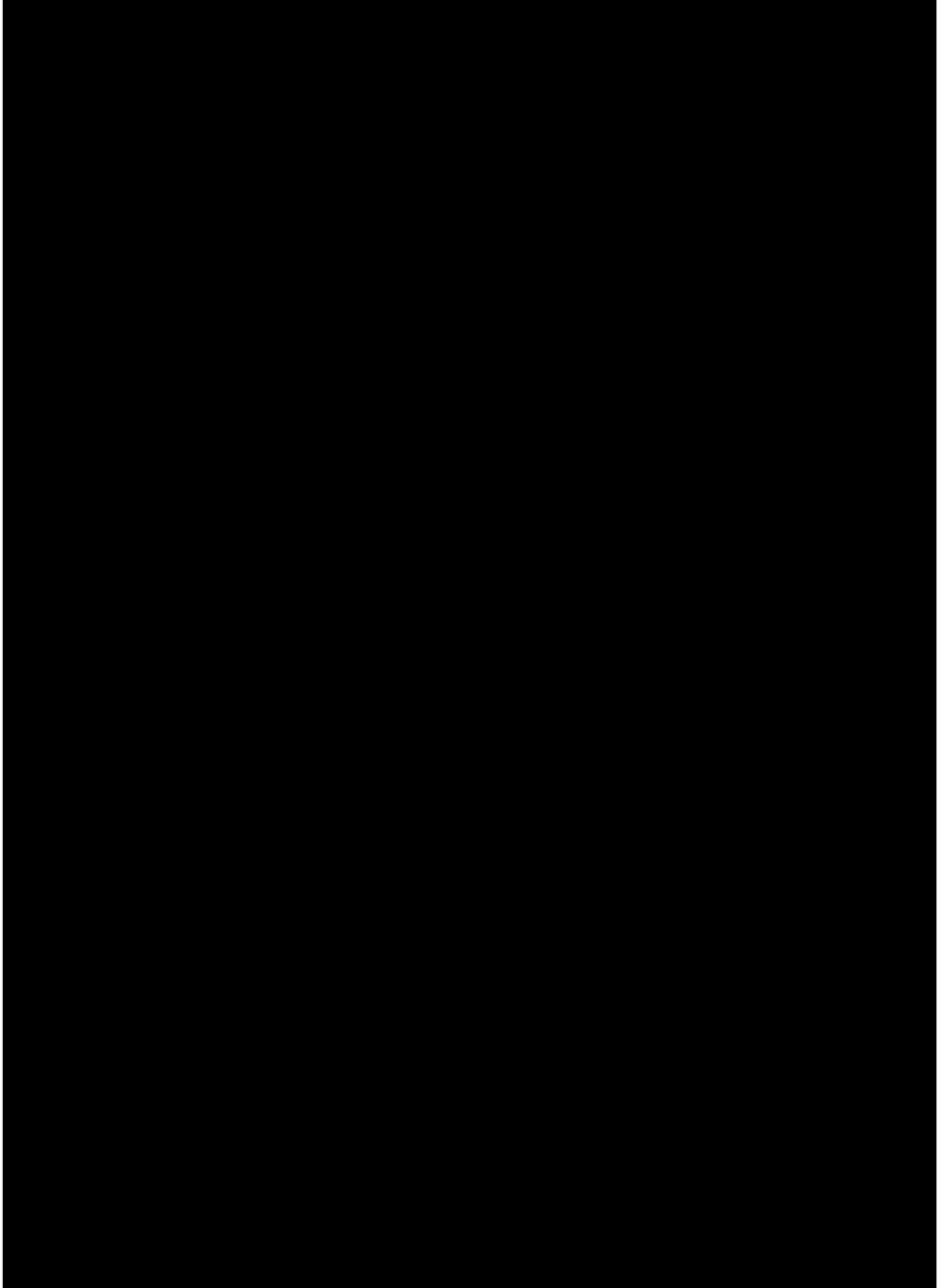
Inspectors never make a judgement based on data alone; they make judgements by applying, objectively and dispassionately, their own professional knowledge and skills, setting the data in context and alongside other sources of information available to them about a school's effectiveness and capacity to improve.

Written for headteachers, teachers, governors and local authorities, *Using data, improving schools* shows how data, if used intelligently, can lead to appropriate judgements being made about a school's performance. It notes the different types of performance data available before looking in some detail at the use of contextual value added data alongside other forms of data.

Data are relatively simple to collect. The challenge for schools, and inspectors, is to investigate the clues that data give about effectiveness and reveal the underlying story behind the figures.

This booklet has been produced by Ofsted with Professor David Jesson, FRSS, University of York.

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Types of performance data

1 Performance data make it possible to measure how well an individual, a school or a local authority is doing and to make comparisons, for example with previous years' performance or with the performance of other individuals, schools or local authorities.

2 Many types of data are available. Nationally, the performance data that are most readily available and frequently used are derived from the measurement of individual pupils' attainment in statutory assessments, public examinations and other national assessments at different points in their schooling.

3 Other data are also used at the national level: data about pupils' attendance, authorised and unauthorised absence, the rate of exclusions, and so on. Data about pupils and their local socio-economic circumstances can also provide information about the context in which the school or local authority is working and the factors that may affect its performance.

4 Some data are collected and used locally rather than nationally. For example, schools hold data about accidents and about racist incidents. They may also keep records of behaviour that the staff consider particularly deserving of praise or unacceptable, and about the rewards and sanctions applied. Schools may gather and use data about parents' and pupils' views, and information about parents' complaints may be recorded. They also hold data about their staff, premises and other resources, and about their funding and how it is used.

5 Data from this wide variety are gathered and used to produce an agreed national set of indicators of performance. This set of indicators has evolved over time, reflecting national priorities of the moment.

6 Currently, the focus is on data that measure pupils' performance in terms of the attainment and progress they make from one point to another in their school career.

7 The priority given to such data is unlikely to change, although other kinds of data may increasingly be used alongside them. The Department for Children, Schools and Families (DCSF) has indicated in its recently published Children's Plan, for example, that it is to work with Ofsted to develop new school-level indicators in relation to pupil well-being.

8 The different types of performance data are:

- raw and aggregated data about attainment
- value added data
- contextual value added data.

9 These are explained in the following sections.

Raw data

10 Pupils' test and examination results provide important information about the effectiveness of a school.

11 These data are analysed to generate key indicators, the most common being 'threshold indicators': the proportion of pupils achieving a particular level or grade. The most important threshold indicators for primary schools are the percentages of pupils achieving level 4 and above in both English and mathematics and those making two levels of progress. For secondary schools, they are the percentages of the pupils achieving five or more grades A*–C (including English and mathematics) in GCSE and equivalent examinations at the end of Key Stage 4 and those making two levels of progress.

12 The data are only as good as the processes that produce them, and only reflect pupils' attainment as measured by specific exercises undertaken on a specific day. Objections will always be possible. It may be argued that the assessment is flawed or the exercises test only certain kinds of attainment in certain ways. However, imperfect as they inevitably are, these assessments have been developed and honed over time and their reliability is high.

13 In a sense, the key indicators selected are arbitrary, as others could equally well be given priority – for example, the percentages of pupils achieving Level 3 and above at Key Stage 2, or six or more good passes at GCSE, or the average point score. But the current indicators are generally agreed to be the basic academic outcomes that should be sought for nearly all pupils by the ends of Key Stages 2 and 4, and they are universally used and understood.

14 However, other analyses and indicators are used for a variety of purposes alongside threshold measures. For example, average points scores are often regarded as a better indicator of pupil attainment as a whole and are used in some calculations of value added. These are important at a school, local and national level as a means of representing a more inclusive measure of raw attainment data.

15 A further potential source of data is the range of assessments used internationally. The most high profile come from the Organisation for Economic Co-operation and Development (OECD) which conducted a Programme for International Student Assessment (PISA) in 2000, and more recently in 2006. The International Association for the Evaluation of Educational Achievement (IEA) also conducts periodic studies into educational achievement in mathematics and science.¹ These assessments often classify countries in order by averaging students' points scores.

16 These international assessments are seldom used in England, although potentially they are the key to evaluating the effectiveness of the education system as a whole, and for comparing its performance with that of other countries.

Value added data

17 When comparing schools' performance it is important to recognise that pupils have different starting points. Value added is a measure of the progress made by an individual pupil, or a group of pupils, compared with the average progress made by similar pupils nationally between key stages. If based on the change in average points score from the end of one key stage to the next, a school's value added figures can be compared with those generated in previous years and by other schools.

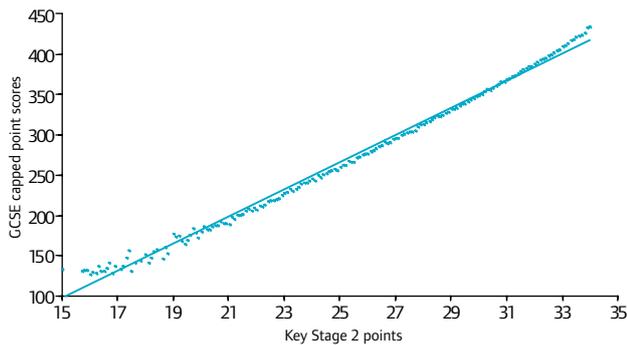
18 Value added indicators may be standardised. The difference between a pupil's actual points score and the average for those with the same prior attainment is calculated and translated into a standardised measure, with the national average being 100 for primary schools and 1,000 for secondary schools.

19 Value added scores can also be aggregated for groups of pupils, schools and local authorities to indicate whether the pupils are progressing better than, worse than or broadly the same as similar pupils nationally. By plotting the actual scores of individual pupils, it is also possible to see whether there are significant variations between the relative progress made by pupils from different starting points.

¹ The IEA conducts a range of studies including the Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS). Details are available from www.iea.nl

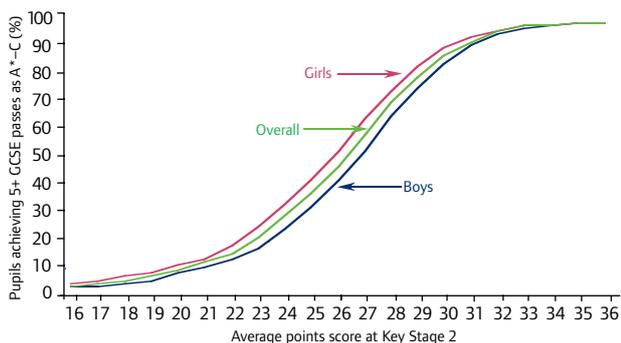
20 Figure 1 gives the pattern of median capped point scores (the best eight GCSEs and equivalents) for students at the end of Key Stage 4 across the range of Key Stage 2 point scores nationally. Joining the medians gives the national median line.

Figure 1: GCSE capped points and Key Stage 2 points



21 Similarly, the proportions of pupils achieving certain thresholds can be shown in relation to their prior attainment. Figure 2 shows the percentage of pupils in mainstream maintained schools nationally achieving five or more GCSE A*–C passes in 2007 for each level of Key Stage 2 average points from 16 to 36. Data for individual pupils and schools may be compared with this national pattern.

Figure 2: Pupils achieving five or more GCSE grades A*–C compared with their attainment at the end of Key Stage 2



22 The clear indication is that pupils' likelihood of achieving five or more A*–C passes increases with their Key Stage 2 average points score. This does not mean that all pupils with similar attainment will achieve equally, simply that the higher the pupil's prior attainment, the more likely she or he is to attain the five plus A*–C threshold.

23 Because it takes account of pupils' prior attainment, which can obviously vary greatly from school to school, a simple value added measure is generally regarded as a fairer indicator of a school's performance than its raw results. However, value added does not take account of factors additional to pupils' prior attainment that can have an influence on their performance.

24 An alternative approach to the calculation of a simple (non-contextualised) value added indicator for schools is to work out the 'conversion rate': the proportion of pupils who achieve a given level at the end of one key stage who go on to achieve a given level at the end of the subsequent key stage. As this measure is not standardised, it reflects improvement over time in schools' absolute performance. The importance of progression measures of this kind has increased recently, with targets based on them being included in the DCSF's Public Service Agreement with HM Treasury, and in the National Indicator Set that will be used in the evaluation of local authorities' performance.

Contextual value added data

25 Contextual value added (CVA) takes the quest for fairer measures of a school's performance – and a 'level playing field' for school accountability – a stage further. Like simple value added, CVA provides an indicator of relative rather than absolute performance: it shows whether the school, with the pupils it has, is doing better than, worse than, or broadly the same as other schools, with the pupils they have.

26 Because this measure of progress takes account of not only the pupils' prior attainment, but also other factors such as the level of deprivation they experience, their special educational needs, and ethnicity and gender, it provides an important measure of the 'school effect' – the difference made by the school itself. If a school is doing relatively well with the pupils it has, whatever its context, its CVA indicator will be positive. As Dylan Wiliam, Professor of Educational Assessment at the Institute of Education, University of London, wrote: 'CVA is – by a long, long way – the best measure of the quality of education provided by a school.'²

27 Figure 2, which compares the proportions of pupils achieving five or more GCSE grades A*–C with their attainment at the end of Key Stage 2, shows how the results for girls and boys differ: a school for girls with high prior attainment is likely to achieve better results than a school for boys with low prior attainment. This, though, shows just two of the contexts – prior attainment and gender – within which a school's examination results need to be placed if 'fair' judgements are to be made of its effectiveness.

28 To measure CVA, the average progress made by pupils between the ends of two key stages is calculated, using their average points scores from end-of-key-stage tests and capped GCSE (or equivalent) points scores. This figure is an indication of the progress that every pupil can be expected to make, with which the actual progress of individual pupils and schools can be compared. The prediction for each pupil is then adjusted to take account of (and eliminate the impact of) a range of contextual factors chosen because they have been shown to be associated with performance and are beyond the school's control.

29 The difference between the pupil's actual score and the adjusted prediction is then calculated and translated into a standardised figure with the median, as for simple value added, being 100 for primary schools or 1,000 for secondary schools. Using a statistical process known as 'shrinkage', which provides an adjustment based on the number of pupils in the relevant cohort, the CVA for individual pupils is then aggregated to produce indicators for groups of pupils, for the school and for the local authority.

30 There are different systems for calculating CVA. The system used by the DCSF and Ofsted, which is reported in annual achievement and attainment tables and provided through RAISEonline, takes account of the following factors:³

- prior attainment in English and mathematics
- ethnicity
- gender
- age within year group
- special educational needs
- eligibility for free school meals
- degree of deprivation in the postcode area where a pupil lives (calculated using IDACI)⁴
- first language other than English
- in care
- mobility.

31 The extent of the adjustment (the coefficient) for each of these factors is determined each year by analysis of the actual results for that year. So if, for example, boys generally performed less well than girls in a particular year, the CVA scores of girls and boys would be adjusted to eliminate the impact of gender as a variable – and the CVA score for a school with more boys than girls would be adjusted accordingly.

32 Adjustments are also made for school-level factors – the prior attainment of the cohort and the range of attainment within the cohort – and to take account of the interaction of some of the different factors listed above. For example, the adjustment made for prior attainment for pupils with home languages other than English differs from that made for other pupils. Adjustments are also made to counteract effects which can distort CVA figures for schools where the pupils' prior attainment is particularly high or low.

² D Wiliam, 'Context beats exam tables in search for best schools', *Education Guardian*, 20 February 2008.

³ RAISEonline is a data analysis tool for schools, local authorities, inspectors and others involved in school improvement. For further information see www.raiseonline.org

⁴ IDACI is the Income Deprivation Affecting Children Index, and is calculated from the percentage of children and young people under 16 in each postcode area living in families in receipt of income support, job seeker's allowance, working families' tax credit or disabled person's tax credit. It is an alternative to eligibility for free school meals as an indicator of socio-economic deprivation.

33 The calculation of CVA for achievement and attainment tables and RAISEonline is a multi-level process. The models are updated year on year in the light of further analysis and feedback from schools and to ensure that the factors included in the models are still the most appropriate. Adjustments are also made which ensure, for example, that no child with really high prior attainment can be predicted to achieve more than is possible.

34 CVA can provide powerful insights into aspects of schools' performance, but it needs to be used with care. CVA is calculated from information within the national pupil database, and can only take account of the variables incorporated within that database. This means that some factors which may have an impact, such as the education and occupation of a pupil's parents, cannot be included because there are no national data available to investigate whether there actually is a relationship, and to model it if there is.

35 There are other factors which are beyond a school's control which cannot be included: for example if a teacher becomes seriously ill and the school has difficulty finding a suitable temporary replacement, or if a fire disrupts the work of the school. However, for those variables that are included, any demonstrable association with variations in the pupils' performance can be reflected in an adjustment of the data.

36 It is critical to realise that CVA should not be used to predict the performance of individuals. It is solely based on the progress of pupils with different characteristics in the past. Mis-using the data to predict future performance could depress expectations of groups of pupils that have performed less well in previous years. For example, just because boys may have performed less well than girls in the past, CVA in no way suggests that it is acceptable for this to happen. All it does is recognise that this is what has happened in practice and that when comparing schools' performances it is fair to adjust the CVA figure to reflect the relative proportions of boys and girls in the school. When setting targets for future performance schools should strive to set equally challenging aspirations for all pupils: they should not assume that pupils from particular groups will perform better or less well than others.

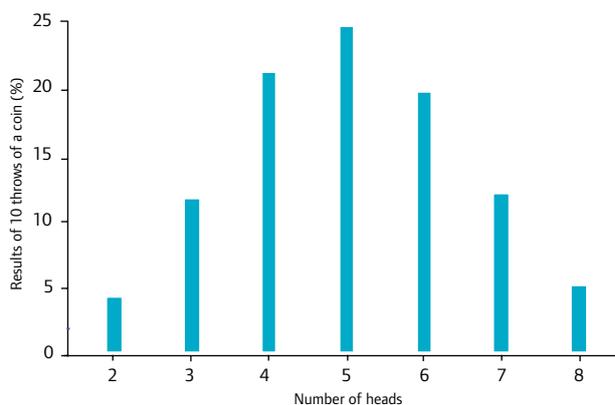
Confidence intervals

37 CVA indicators are always published with two other figures, the 'upper' and 'lower' confidence intervals. These are an important statistical caution, showing the range within which the 'true' CVA figure lies. The idea of confidence intervals is easy to understand in other contexts and its importance to CVA needs to be emphasised.

38 Why upper and lower confidence intervals are necessary and how they are worked out can be answered by looking at a familiar situation – the tossing of a coin.

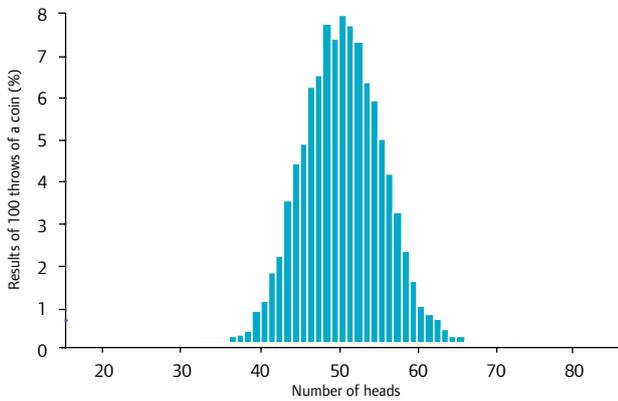
39 How many heads do you expect in 10 throws? As shown in Figure 3a, which shows the results of coin tosses randomly generated by a computer, any outcome from two heads to eight heads is 'reasonable' – that is, it is expected to occur five times or more for every 100 repetitions. Note that five heads only occurs 25% of the time.

Figure 3a: Distribution of possible outcomes when a coin is tossed 10 times



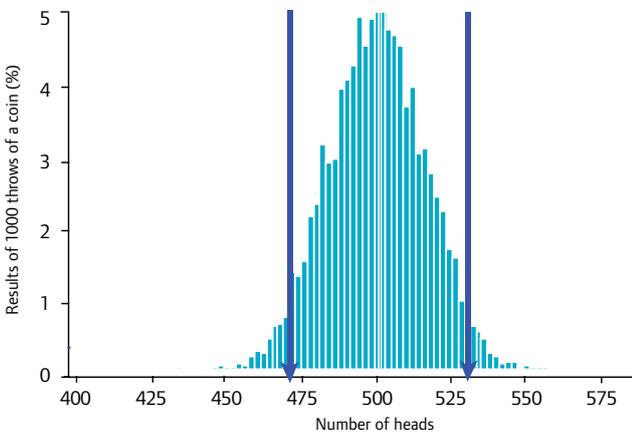
40 When the number of tosses is increased to 100, any outcome between 40 and 60 heads – but nothing outside this range – is 'reasonable' (see figure 3b). Anything else might suggest that the coin is biased.

Figure 3b: Distribution of possible outcomes when a coin is tossed 100 times



From 1,000 throws, the ‘reasonable’ number of heads is compressed into a much smaller range – from 470 to 530 – or an average of 4.7 to 5.3 heads for every 10 throws (see figure 3c).

Figure 3c: Distribution of possible outcomes when a coin is tossed 1,000 times



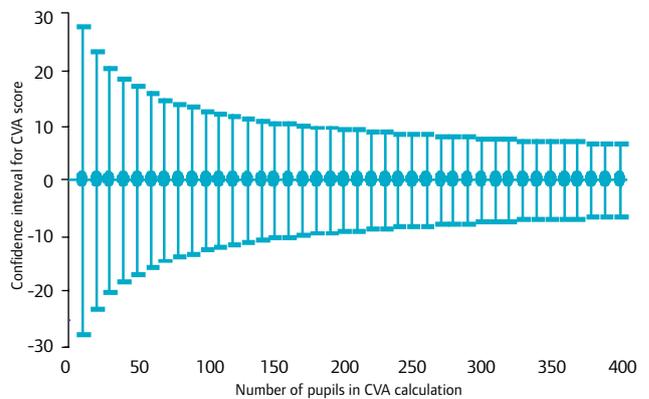
41 These illustrations make the important point that the larger the sample being investigated, the narrower the range of reasonable outcomes. This applies precisely to the values emerging from a CVA calculation: the larger the sample – the more pupils there are in the cohort to which the data refer – the narrower the gap will be between the CVA figure and the upper and lower confidence intervals.

42 In the coin tossing examples, a ‘reasonable’ value for the number of heads to expect lay between upper and lower confidence intervals. With CVA the situation is very similar.

43 CVA uses 95% confidence intervals, which means there is 95% confidence that the ‘true’ value of CVA for the group in question lies within the range given.

44 Figure 4 is taken from DCSF’s explanatory document about CVA.⁵ It shows the confidence intervals for CVA for schools of a given size: they range from about 40 points for a school with around 50 pupils in its year cohort to just under 20 points for a school with a cohort of 400. Size matters.

Figure 4: Confidence intervals for CVA score



⁵ This document is available from the ‘technical annex’ link at www.dcsf.gov.uk/performance/tables/schools_06/s4.shtml

45 If a school's CVA range includes 1,000 (the average for all schools in England) then the school's performance is interpreted as being close to average. This means that after taking account of all factors that affect pupils' performance the pupils' actual performance is within the expected range.

46 Looking at the CVA scores in the example below, it may at first appear that School A is better than School B.

	Lower confidence limit	CVA	Upper confidence limit
School A	998	1,009	1,020
School B	980	992	1,004

47 Because 1,009 is greater than 992 it is tempting to infer that School A's performance is better than School B's. However, that would be incorrect. In both cases, the range between the upper and lower confidence limits includes 1,000, so both schools are achieving average outcomes; their performance is about as expected. No meaning can be attached to an absolute CVA value, and any ranking of schools by their CVA values is meaningless.

48 The confidence intervals for the two schools were different because their cohorts of pupils were of different sizes. School A had a cohort of 200 pupils, which explains why its range of values was around 11 points either side of the CVA measure (see figure 4). School B had a slightly smaller cohort – just under 150 pupils in the year group – which explains why its values showed a range of 12 points on either side of the published CVA value.

49 Table 1 shows how the ranking of CVA measures can lead to inappropriate conclusions. Three schools have been ranked on their Key Stage 2 to Key Stage 4 CVA measure using RAISEonline. In the light of the ranking, judgements about the schools' GCSE performance would appear to be unproblematic, with C clearly doing well, D okay and E doing rather less well than expected. However, to accept these judgements at face value would be wrong. When the upper and lower confidence intervals are considered, the only school that can be described as doing better than expected is D, because although its CVA measure is ranked 32nd, it is above average – the lower confidence limit is above 1,000.

Table 1: GCSE performance in 2007 and CVA measure for three schools

School	pupils achieving 5 GCSEs A*-C (%)	pupils achieving 5 GCSEs A*-C, including English and Maths (%)	GCSE points	CVA	CVA percentile ranking	Lower confidence limit	Upper confidence limit	Interpretation
C	100	100	590.0	1016.2	16th	997.6	1034.8	Not enough evidence to be sure the school is different from average
D	68	53	388.3	1007.1	32nd	1000.7	1013.6	CVA is higher than average
E	35	8	315.0	997.3	57th	980.4	1014.1	Not enough evidence to be sure the school is different from average

Why each kind of data is important

50 No single kind of data or analysis can tell the whole story about a school. To make an accurate three-dimensional image of a human being, photographs from as many angles as possible would be needed. Similarly, to achieve a rounded and comprehensive picture of a school's recent performance, a range of different kinds of data and analyses is required.

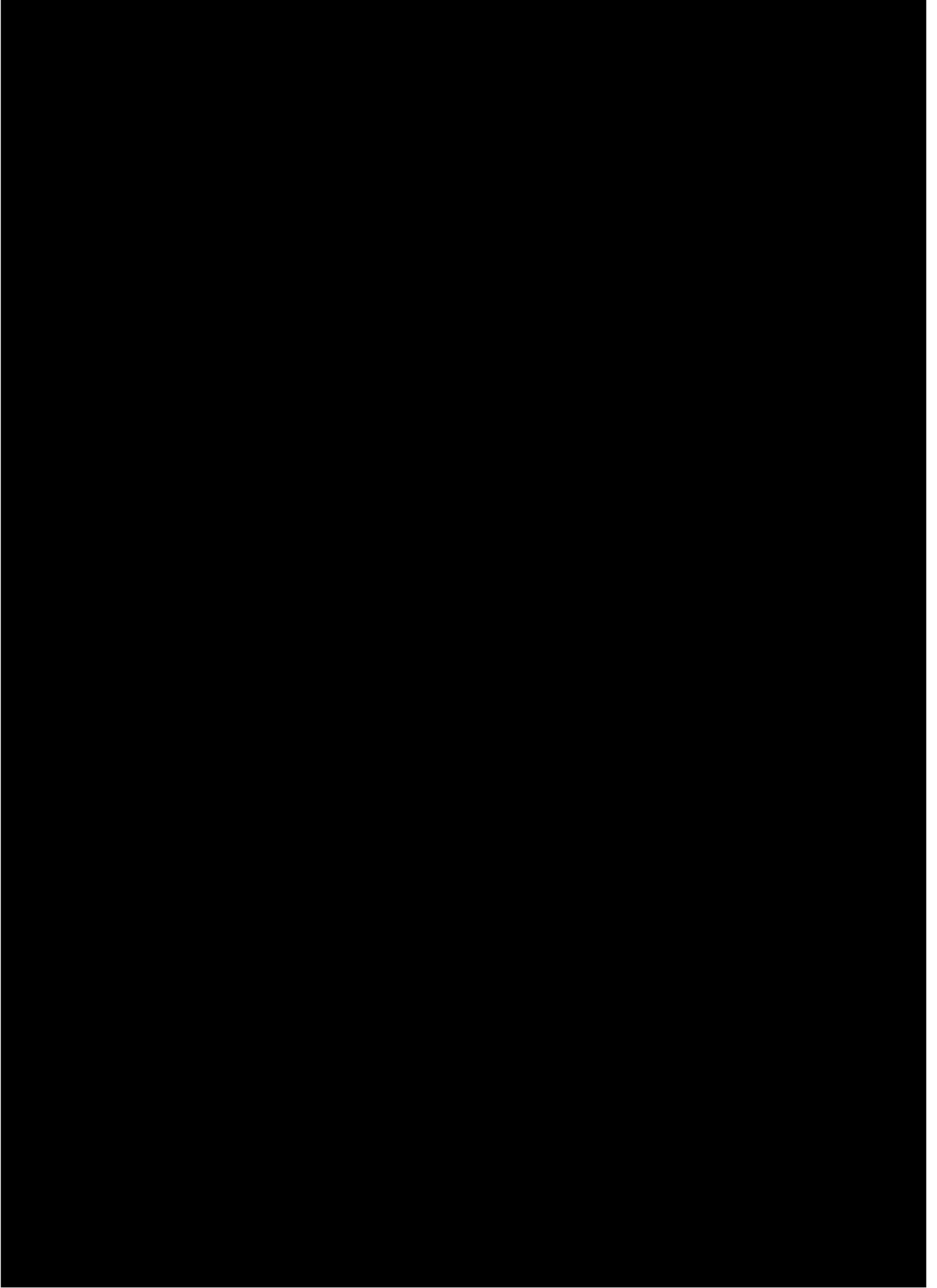
51 In schools of all kinds, it is always important to know what the pupils have attained in comparison with pupils of their age nationally. When evaluating a school's performance, it is fair to make suitable allowances for the context in which it is working, but for the pupils' prospects in their future lives, no allowances will be made. The raw results are all that matter to them and to their future chances.

52 It is also important to know how different groups of pupils have performed in absolute terms. It is no help to pupils from a particular ethnic group who have not performed well to know that other pupils from the same group nationally have not performed well. The priority is to improve the performance of all individuals and, if a particular group is underachieving, to focus particular efforts on improving the performance of individuals in that group.

53 The 'floor targets' set by the Government are framed in terms of absolute attainment at particular thresholds rather than value added.⁶ The rationale for these targets is to improve the life chances of all pupils by identifying expectations of minimum standards which all pupils should reach at key stages. A further function of the 'floor targets' could be seen as ensuring that no pupil attends a mainstream school at which the overall attainment outcomes fall below a certain level – it having been shown that the overall attainment of a cohort influences the attainment of individuals within that cohort.

54 When evaluating school performance, however, the value added data are important. Both simple value added (as a standardised measure and as a conversion measure) and CVA data have roles to play in building up an overall picture of a school's effectiveness, and each can be a corrective for the other. CVA can illustrate the extent to which contextual factors can legitimately be regarded as having influenced the progress that pupils have made in relation to their prior attainment, while simple value added measures can bring a sense of perspective if a school's CVA measure is particularly high or low. But 'absolute' success remains crucial.

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How schools can use performance data

55 School performance data matter because they provide the basis for schools' accountability to their users and the local community, for their own monitoring and self-evaluation and for their planning for improvement. Such data also inform judgements about whether a school is providing value for money.

56 Although schools in England operate within a statutory framework and respond to priorities and initiatives produced nationally, they retain considerable scope to make local decisions about how to manage their affairs. Therefore, although what they do is at least partly prescribed, how they do it and how well they do are matters over which the school has considerable control.

57 Schools are responsible and therefore accountable in a number of ways and in a number of directions. In the first instance they are accountable to their users, those for whom they provide a service, principally, pupils and their parents, but also (and increasingly) to others in the local community who may use the extended services for which schools are now taking responsibility. In a sense, too, schools are also accountable to those who will be responsible for the next stages of the education or training that their pupils will receive, and to the employers for whom they will eventually work. Schools are also accountable to the national and local bodies that fund education and ultimately to the taxpayers and others who provide the resources.

58 Some key accountability questions are:

- How good are the results attained by the pupils?
- How good is the education and care provided by the school?
- How much value is provided for the money and other resources made available to the school?

59 Responding satisfactorily to these questions requires evidence. The most powerful evidence, and that which best facilitates comparison, is that provided by data relating to the performance of pupils.

60 Schools can, and do, make extensive use of performance data for self-evaluation and planning for improvement, and also when reporting on their performance to a range of external audiences, notably parents and the local community. For the latter purpose, they generally use the same widely understood threshold measures as are used for national reporting.

61 For self-evaluation and planning for improvement, however, a more detailed analysis is required, enabling the school to identify the strengths and weaknesses of its performance not only across phases, subjects and groups of pupils, but also class by class, pupil by pupil and question by question, using the full range of data: raw results, value added and CVA. The purpose is to enable the school to diagnose the reasons for any variations in performance, to identify priorities for improvement, and to plan the actions and put in place the support to bring about that improvement.

62 It is worth stressing again that although CVA and other value added methods only measure past performance over a given period of time, they do allow important comparisons to be made. However, neither CVA nor any other system of evaluation should be used to set lower expectations for any pupil or group of pupils. The focus must be on helping schools and their pupils achieve the best outcomes possible.

Data packages: how they work and the differences between them

63 There are three main data packages used by schools for self-evaluation, planning for improvement and setting targets: RAISEonline, the Data Enabler toolkit and a package produced by the Fischer Family Trust.

64 Secondary schools tend to use all three data packages; primary schools generally use RAISEonline and the Fischer Family Trust package only. There are other packages available as well. The key point to keep in mind when using the different packages is that they do not always agree. When there are differences, it does not mean that one or all of them are wrong. But it does indicate that further investigation is needed to understand the results.

RAISEonline

65 This interactive online package was developed jointly by the Department for Children, Schools and Families (DCSF, formerly the Department for Education and Skills, DfES) and Ofsted, and launched in September 2006 as a successor to the Performance and Assessment (Panda) report issued by Ofsted and the Pupil Achievement Tracker (PAT) issued by the then DfES. For each school there are reports and analyses that include contextual information, raw attainment data, simple (non-contextualised) value added data and target setting indicators. Data are presented for the school overall, but the package's interactive features enable schools to analyse the performance of individual pupils and groups, and to input supplementary data of their own.

66 Further information can be found on the RAISEonline website: www.raiseonline.org

The Data Enabler toolkit

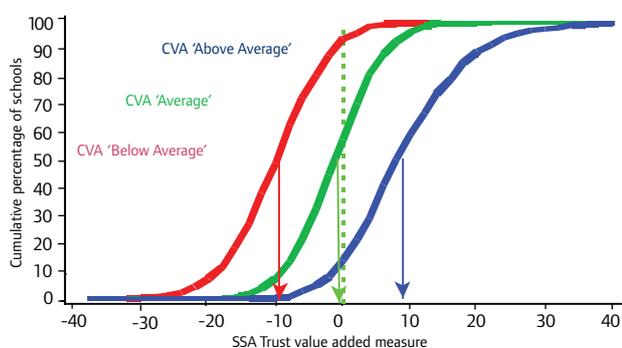
67 This is an online resource for secondary schools with specialist status. Developed by the Specialist Schools and Academies Trust (SSAT), the toolkit provides analyses of simple value added data by plotting GCSE examination data against data about the pupils' attainment in the statutory assessments at the end of Key Stage 2. It does not provide CVA data. The package supports schools in setting targets for the performance of pupils who will take GCSE examinations in the future; in this instance by estimating the results likely to be achieved by pupils in five bands of attainment at the end of Key Stage 2. Data on the uptake of specialist subjects and for performance in them are produced for each type of specialist school.

68 Further details can be found on the Specialist Schools and Academies Trust website: www.ssatrust.org.uk/toolkit

69 By comparison with CVA, SSAT value added employs school level outcomes using the percentage of pupils achieving five or more A*–C (or equivalent) passes and five or more A*–C passes (or equivalent) including A*–C passes in English and mathematics. The factors included are school average Key Stage 2 points and gender mix and the results are presented in terms of the 'bonus' or 'deficit' which a school's performance shows in respect of the percentage of pupils achieving each threshold measure.

70 Comparison of CVA and SSAT value added indicators (shown in Figure 5; see p 14) suggests that they give a similar overall picture of pupils' performance. However, as the chart shows, the indicators for individual schools are sometimes different. For example, some 10% of schools evaluated by CVA as providing 'below average' performance are classified by SSAT value added as having either neutral or slightly positive value added.

Figure 5: Comparison of SSA Trust and CVA evaluations of school performance 2007



71 CVA provides a three-way classification of schools' performance. Figure 5 links this classification with the SSAT estimate of each school's value added derived from the analysis outlined above. The three S-curves show how these three CVA classifications map into the value added estimates from the SSAT framework. They show a clear coherence for most schools – CVA 'below average' schools (the red curve) has a median 'trust' measure of -10%, CVA 'average' schools (green) have a median trust value of 0%, and 'above average' CVA schools (blue) have a median trust measure of +10%.

Fischer Family Trust

72 A package produced by the Fischer Family Trust helps schools and local authorities to make more effective use of pupil performance data. The data and analyses are similar to those contained in RAISEonline but they use a different statistical methodology, known as ordinary least squares (OLS), for calculating CVA, and there are different indicators of deprivation.

73 More information can be obtained from the Fischer Family Trust website: www.fischertrust.org

Other data packages

74 Yellis and MidYIS, produced by the University of Durham, have for many years helped schools to predict and evaluate their performance in A level, GCSE and Key Stage 3 assessments. Cognitive ability tests (CATs) are used by some secondary schools to provide indicators of the attainment of their pupils on entry to Year 7 and/or at subsequent points at Key Stage 3, and to provide estimates of their subsequent performance in GCSE examinations at the end of Key Stage 4.

How inspectors use performance data

75 School performance data play an important part in inspection, but there is much more to inspection than analysis of a school's performance data.

What an inspection involves

76 An inspection of a school by Ofsted involves gathering and analysing evidence, including first-hand evidence obtained on site, in order to make judgements about the school's effectiveness – how well it is performing. The inspection report provides an independent external evaluation of the quality and standards of the school. Ofsted inspectors are highly trained and rapidly acquire extensive experience in judging standards and quality nationally.

77 Schools are given very short notice of their inspections, usually no more than two days, so that they can avoid the distractions of a long period of preparation and inspectors can see the school operating as it does normally. Inspectors do not look at everything a school does. They focus on the school's overall effectiveness and its 'central nervous system': the outcomes it achieves for its pupils, the quality of what it provides, and its leadership and management. The outcomes investigated by inspectors are the five Every Child Matters outcomes: being healthy; staying safe; enjoying and achieving; making a positive contribution; and achieving economic well-being.

78 Inspectors take the school's self-evaluation and its performance data as their starting points, using them to write a pre-inspection briefing, which sets out their provisional thoughts about the school and the issues they will investigate further during the inspection. The briefing is sent to the school and is the starting point for a dialogue between the inspectors and the school's senior leaders that continues throughout the inspection. As well as observing lessons, talking with staff and governors, gathering the views of parents, and looking at current and previous work, inspectors also place considerable emphasis on gathering pupils' views through meetings and informal conversations in lessons and around the school.

79 Inspection judgements are made on a four-point scale: outstanding, good, satisfactory and inadequate. The judgements are included in the inspection report, which is usually about 4–6 pages long and published about three weeks after the end of the inspection. The report includes a letter from the inspectors to the pupils, underlining that pupils are the most important 'users' of what the school provides.

Why data are important in an inspection

80 Data about a school's academic performance are an important source of evidence about the outcomes it achieves for its pupils. Inspectors take data seriously, analyse them, and use them to inform – but not to determine – their judgements about the standards pupils attain, the progress they make, and their overall achievement. The data can be used to ask questions and set an agenda for discussion, effectively providing the 'signposts' for the inspection. But the data available to inspectors can never be fully up to date and so further evidence of the school's current work is essential.

81 Three points must be stressed:

- 1) Hard data are only part of the evidence inspectors use to reach their judgements. Inspectors also consider the school's more recent internal assessments of their attainments and progress, the pupils' current progress and observation of their learning in classrooms.
- 2) As discussed in previous sections, the data that inspectors use may come from a range of different sources. Inspectors have access to the data contained in the RAISEonline report, and this is their basic source, but the school may also have relevant data from the Fischer Family Trust or elsewhere. Inspectors will use the data to shape some hypotheses that they then test out during inspection through observation and by asking the relevant questions. Data from different sources may not always tell exactly the same story: they need to be used with caution.

3) The data give inspectors an indication of the attainment and progress of particular groups of pupils based on assessments at the end of a key stage, at some point in the past. Data about the pupils' attainment at the end of Key Stage 2 or Key Stage 4 often relate to pupils who are no longer on the roll of the school they were attending when the assessments took place. Inspectors always need to ask whether the performance of the pupils on the school's roll at the time of the inspection is better than, worse than, or in line with, that indicated by previous results.

82 The three judgements mentioned above – about standards, progress and achievement – sound similar but the differences between them are important.

83 **The judgement about standards** is a judgement about the pupils' attainment in comparison with the attainment of pupils of the same age nationally. It is described in Ofsted's framework for inspection as 'an evaluation of the standard of pupils' work in relation to their learning goals'.

84 **The judgement about progress** is a judgement that takes account of the pupils' starting points and reflects the gains they have made, and consequently the value added by the school to their attainment. It is described in the framework as 'an assessment of pupils' progress relative to their prior attainment and potential, with any significant variation between groups of learners'.

85 **The judgement about achievement** is the overall professional judgement that inspectors make about the academic outcomes achieved by the pupils. It is described in the framework as 'an overall assessment of pupils' success in achieving challenging targets, including qualifications and learning goals, with trends over time and any significant variations between groups of learners'.

How inspectors use data before an inspection

86 In the preparatory work they undertake before an inspection, inspectors begin by looking at the school's self-evaluation, normally recorded in its online self-evaluation form (SEF), to see how the school has analysed its own performance data.

87 At the same time, they look at the analyses of the pupils' test and examination results in the RAISEonline report, which is available both to inspectors and to the school. For some types of schools – nursery schools, special schools and pupil referral units – the RAISEonline report may provide little or no evidence of this kind.

88 Inspectors compare the self-evaluation in the SEF with the analyses in the RAISEonline report, when the latter are available and relevant. When completing their SEFs, most primary and secondary schools refer to the data in the RAISEonline report, but they often refer also to additional information from other analyses that they use. Inspectors will consider all the information in the SEF and any other information which the school can provide.

89 For most schools, when looking at the RAISEonline report and the SEF, inspectors will investigate whether the evidence suggests the following:

- The pupils' test and examination results at the end of key stages are above, broadly in line with, or below those achieved by pupils of the same age nationally. They will look at the proportions of pupils reaching particular levels of attainment, and also at the average points score, which reflects the attainment of all the pupils in the year group. When inspecting primary schools, they will look at the SEF to see how the outcomes of assessments of children at the end of the Foundation Stage compare with the general pattern nationally.
- The trend in the pupils' attainment is up, down or 'flat'.
- There are significant variations in the pupils' attainment in different subjects, or in the attainment of boys and girls, or in the attainment of different groups of pupils – for example, those from black and minority ethnic groups, those entitled to free school meals, those with learning difficulties and/or disabilities, and those in public care.

90 These investigations will help inspectors arrive at a provisional view of standards in the school, which will be recorded in the pre-inspection briefing and discussed with the leadership team during the inspection.

91 Inspectors will also form a provisional view of the pupils' progress from their starting points, when they arrive at the school, and at the beginning of each key stage. To do so, they will investigate the evidence in the SEF and the RAISEonline report about:

- the pupils' attainment on entry to the school and, for primary schools, at the beginning of Key Stage 1
- the value added by the school
- the proportions of pupils who have made the expected progress between the ends of key stages
- the pupils' current progress – the RAISEonline report will not include this, but evidence may be provided in the SEF that will need to be verified by other evidence and direct observation once in the school
- the proportion of students who satisfactorily complete courses they start
- any variations in progress between subjects or key stages.

92 Inspectors will consider whether the school's CVA indicators in the RAISEonline report suggest that the progress of the pupils as a whole, and of particular groups of pupils (boys, girls, those from different minority ethnic groups, those with different prior attainment, and so on) is greater than, broadly in line with, or less than, that of pupils nationally when contextual factors have been taken into account. They will also consider any other value added data and indicators referred to in the SEF.

93 These provisional views, and any particular issues that inspectors will investigate further, are shared with the school in the pre-inspection briefing and act as a signpost for further discussion.

How inspectors make judgements

94 It is important to stress that, although inspectors will arrive at the school having undertaken preliminary analysis and reached provisional views, they will not have made any judgements. Their judgements will not be finalised until the end of the inspection, and will take account of the evidence they gather on site as well as that from the data and other information available before the inspection.

95 The nature of the evidence gathered will, to some extent, reflect the issues identified by inspectors for further investigation on site. It may include additional data or analyses provided by the school, as well as the evidence from first-hand observation.

96 In reaching their judgements about standards, alongside the data, inspectors will also consider evidence from more recent information provided by the school, from a scrutiny of the pupils' work, and from their observation of the knowledge, skills and understanding that pupils demonstrate during the inspection.

97 Similarly, inspectors' judgements about progress will take account of the school's analyses of the recent progress of pupils currently in the school, scrutiny of the pupils' work and discussions with them and their teachers, and the gains made by pupils in the lessons observed, as well as the evidence from the data analysed before the inspection.

98 The overall judgements about pupils' achievement are made after inspectors have reached their views of standards and progress. They take account of those judgements and also assess pupils' success in achieving challenging targets. The evaluation of the pupils' achievement in the school as a whole is one of the key judgements made by inspectors, and usually has a significant influence on their assessment of the overall effectiveness of the school.

Conclusion

99 Data play a part in internal and external evaluations of schools' performance. Although data, and the interpretation of data, do not determine assessments, they offer great opportunities for inspectors and schools to explore strengths and weaknesses.

100 At the very least, as schools seek to maximise the progress their pupils make and look for innovative ways of doing so, performance data (particularly when complemented by rigorous and objective teacher assessment) can provide a very useful guide in assessing how effective these interventions are. Data also help with the basic requirement to ensure that all pupils benefit from the school's commitment to the highest levels of achievement for all.

101 It is schools' capacity to determine where they want to be, using where they are now as a starting point, that is critical. Improving the understanding and use of data is a key element of improving schools.

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