Ofsted | Better education and care

Training for School Inspection

2005

Data module

August 2005

Contents

Introduction

Aims

This module is designed to brief you on interpreting data in the new-style PANDA report which will be used in inspections from September 2005.

It aims to:
- inform you about the types of data analyses in the PANDA report
- help you find the data you need quickly
- assist you in interpreting a school's performance data
- demonstrate how the data inform inspection judgements
- enable you to pick out inclusion issues and pupils to follow up

It builds on the *Interpreting data* CD-ROM sent to inspectors in April 2005, from which the training section is available on the Ofsted website at http://www.ofsted.gov.uk/schools/interpretingdata.cfm.
The following sections of the April materials are particularly useful preparation for this data module:
- Information sheets 1 and 2 on scoring systems at Key Stages 1-4
- Module 1 part 2 on standards in subjects at Key Stage 4
- Module 2 on interpreting five-year trends from graphs.

This data module does not include interpretation of the sixth-form PANDA report; it is dealt with in module 6 and information sheet 9 in the April materials. You may also find module 4 of the April materials helpful when evaluating how effectively a school uses its performance data.

This data module explains how to interpret the new styles of graph to gain a quick impression of the school's standards and progress. It uses tables, graphs and statistics from anonymous draft 2004 PANDA reports, retaining original chart titles and numbers, some of which have changed in the final PANDA reports.

As the data in the PANDA report relate only to school pupils, the term 'pupil' is used throughout, except where a direct quotation from the *Guidance for inspectors on using the evaluation schedule* uses the term 'learner'.

The module should take between 6 and 8 hours, depending upon your experience and whether you complete all tasks in full. The guideline times for each section add up to a total of seven hours.

Tasks

Small graphs needed for tasks appear within the text in this module. Larger graphs for tasks are in a separate appendix, so that you can refer to them

easily while reading the task. Another appendix contains answers and commentaries, for you to consult after each task or for prompts.

You may find it easier to work if your papers are set out so that you can leave open the task, graphs and answers at the corresponding pages, and consult the *Reference booklet*.

The *Reference booklet* forms a key part of the training but is also intended for use during inspection.

Resources required for this module

- Reference booklet
- Appendix 1, graphs for the tasks
- Appendix 2, answers to the tasks
- Anonymous primary PANDA report
- Anonymous secondary PANDA report

Equipment you may find useful

- Highlighters
- Ruler (to help you read some of the graphs)

Section 1   Setting the scene

Time   **15 minutes**

Key objectives

- To know about the roll out of the new-style PANDA reports
- To know which inspection judgements the data will inform
- To be aware of the key features of the data, including statistical significance.

Resources required

None

Section detail

Availability of the new-style PANDA report

The new-style PANDA report will be available to schools and inspectors on the Ofsted website from the beginning of the September 2005 term. It contains new styles of analysis and display that are being developed for the interactive PANDA. The wording on the front cover 'Validated Data for 2004 with Contextual Value Added' distinguishes it from earlier PANDA reports.

The version with 2004 data will be available for inspections in September 2005. The 2005 PANDA will be similar in style to the 2004 version but will have a few additional analyses. It will be issued later in the autumn term, with the unvalidated data for each key stage made available as soon as it is ready. For example, Key Stage 4 data are expected to be available before Key Stage 3 data so will be provided in a 2005 PANDA report instead of being delayed until data from both key stages are ready. At this time, to evaluate Key Stage 3 performance you will need to refer to the 2004 PANDA.

Which inspection judgements do the data inform?

The data in the PANDA report inform the judgements on:
- standards
- progress.

Taken together, these underpin the judgement 'How well do learners achieve?'

The data also enable you to ascertain the attainment on entry for the whole school and to evaluate whether targets are adequately challenging.

In addition, recent changes in standards and progress inform the judgements on overall effectiveness, teaching and leadership and management.

Evaluation of inclusion may be informed by interpreting the data for groups of pupils and through identifying the proportion of pupils omitted from a table or graph, then investigating the school's own data for these pupils.

What are the key features of the data?

The data provide a quick overview through graphs, backed up by diagnostic information for groups and subjects that shows where strengths and weaknesses in standards and progress lie.

The main differences from the previous PANDA report are:
- more robust analyses based on statistical tests
- removal of benchmark groups
- use of contexts to account for pupils' characteristics and consequently isolate school effectiveness
- greater use of pupil-level data.

The data give overall information on standards in comparison with national averages. They provide contextual value added (CVA) scores based on individual pupils' results. CVA calculations take into account factors that affect pupils' achievements such as gender, age and ethnicity, as well as prior attainment, so offer a robust way of isolating and evaluating the **progress brought about by the school**. However, they cannot take account of data that are not collected, such as the occupations of parents and carers.

The new-style PANDA report does not provide grades; instead it uses significance tests to pick out only the performance we are 95% confident is different from the national average. These tests identify different proportions of schools as significantly different from average for each set of attainment or CVA analyses. For CVA analyses of overall average points score (APS) and for individual subject APS, roughly the:
- top quarter of schools shows **progress** that is significantly above national average (sig+)
- middle half of schools shows **progress** that is not significantly different from national average
- lowest quarter of schools shows **progress** that is significantly below national average (sig-).

Consequently, the fact that a school has sig+ CVA distinguishes it from those with sig- or not significant CVA, but does not distinguish it from the other 25% of schools that also have sig+ CVA.

In contrast, for analyses of **attainment** shown by APS, much higher proportions of schools have results significantly different from average. For overall APS, this is between 65% and 85% of schools. Consequently, the fact that a school has sig- overall attainment does not distinguish it from the other roughly 30% to 40% of schools with sig- attainment. Tables 18 and 19 in the

Reference booklet show the proportions of schools significantly different from average for each key stage, for both APS and level threshold analyses.

Why significance tests are used

In any one year, you need to evaluate the progress and standards that the **school enables** its pupils to achieve. However, you need to base this on the results of the particular cohort of pupils who were assessed in that year. We cannot be certain that these pupils do not have any peculiar characteristics that make their results unrepresentative of progress and standards attributable to the school. The level of this uncertainty is dependent on the number of pupils in the cohort. For example, we would be less certain of the **progress attributable to the school** for a Key Stage 2 cohort of three pupils in a small school whose parents all happened to be primary school teachers than for a cohort of 100 pupils, where an unusual distribution of characteristics is less likely to occur. Consequently we can be more confident that a school's results give a fair reflection of the **school's actual performance** when the results are for a large cohort of pupils.

Statistical methods allow us to quantify the uncertainty around a school's results using significance tests. If a school is found to have a significantly better result this means that, even after allowing for the fact that we are drawing an inference from the results of a particular group of pupils, we are 95% certain that the school's actual performance is better than the national average, and not due only to the particular group of children assessed.

The larger the cohort or group, the more likely it is that the results will be significant, even if they differ only slightly from the national average. This module provides guidance on interpreting significance in relation to cohort size.

How results of significance tests are shown

The results of significance tests are shown differently for attainment and for CVA. To inform the progress judgement, the CVA graphs include a bar above and below the plotted CVA value to show the range within which we are 95% confident that the progress attributable to the school lies; this is called the 95% confidence interval (CI). If the interval does not cross the national average line, we can be 95% confident that the school's performance is different from the national average.

The size of the **CVA confidence interval depends only on the number of pupils** in the cohort. Where the interval is narrow, the cohort is large; where it is wide, the cohort is small. When arriving at inspection judgements on progress you should take into account these confidence intervals, and not place undue emphasis on the position of the school's CVA score in the national distribution. This is given by its percentile rank, in other words the percentage of the schools in the national graph that would be above it.

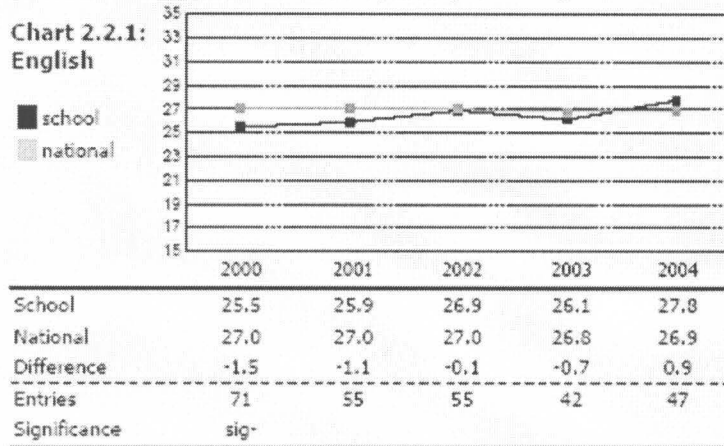School 1 and national KS1-2 overall CVA distribution
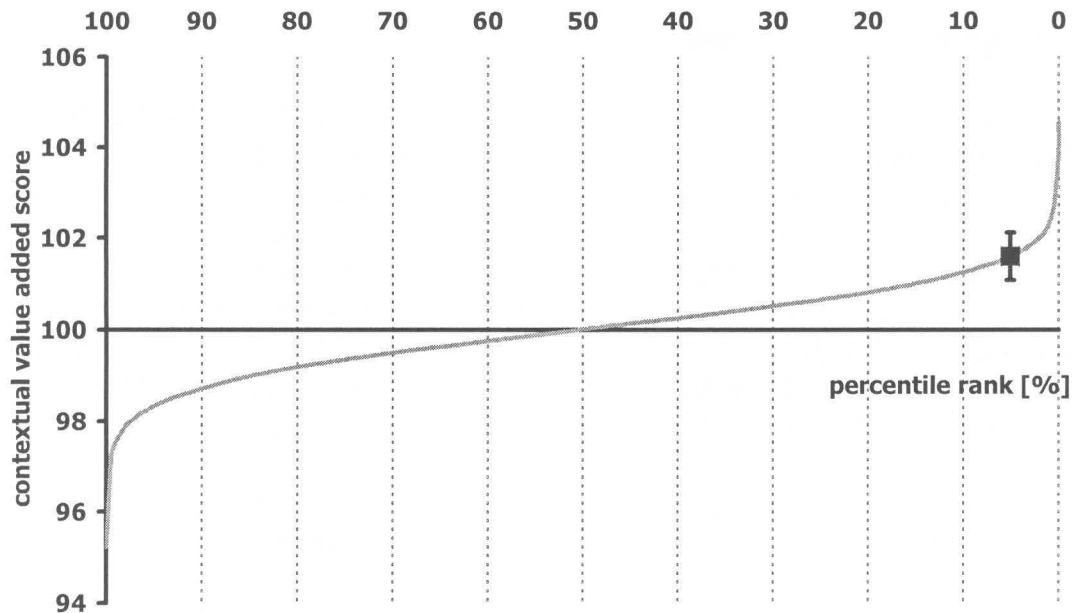
The 'snake plot' graph above shows School 1's CVA score by a black box and its confidence interval by the bars above and below the box. The curve is formed by plotting the CVA scores of all schools in the country. The percentage scale printed across the top of the graph shows that there are about 5% of schools with higher CVA scores than School 1, so it is roughly at the 5th percentile. The school's confidence interval does not cross the national average line, which is drawn at a CVA score of 100, so School 1 has a CVA score significantly above the national average.

In contrast, on the graphs of attainment results, the confidence interval is not shown. **For attainment, the size of the confidence interval depends upon the variation between individual pupils' results as well as the size of the cohort**. A significance test is carried out to find whether the confidence interval would fall completely above or below the national average. The result of this is shown in the tables below the graphs.

The attainment graph below for School 2 shows that the standard of its most recent cohort is just above the national average having risen from significantly below it. Nevertheless, the size of the cohort and the variation within it does not enable us to be 95% confident that the standard is not due to the particular pupils in it. So we cannot say that from this graph alone the school's actual standards are above the national average; instead we can report them as broadly in line with national standards.

School 2's attainment in Key Stage 2 English

Chart 2.2.1: English		2000	2001	2002	2003	2004
■ school national						
School		25.5	25.9	26.9	26.1	27.8
National		27.0	27.0	27.0	26.8	26.9
Difference		-1.5	-1.1	-0.1	-0.7	0.9
Entries		71	55	55	42	47
Significance		sig-				

Evaluating standards and progress

A schools' attainment or CVA may be significantly different from the national average but close to it. You need to consider the educational importance of such differences, for example whether they represent an average of one national curriculum level in each core subject for only a tenth of the pupils or for all pupils. There is guidance on this later in the module.

When evaluating standards and progress you need to consider the:
- results in relation to the national average
- educational importance of the results
- statistical significance
- variation between key stages, subjects, groups and individual pupils.

This module provides guidance on each of these.

Review

Do you know:

- when the new-style PANDA report will be available
- which inspection judgements the data will inform
- the key features of the data, including statistical significance?

Section 2   Finding your way around the PANDA report

Time   **30 minutes**

Key objectives

- To be aware of the information provided in the new-style PANDA report and its sequence
- To know how contextual information is displayed.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report

Section detail

The final version of the 2004 new-style PANDA report will contain the following four sections:

1. Summary
2. Contextual information about the school, including attainment on entry
3. Contextual value added (CVA) information
4. Attainment information, including subject detail at KS4 and 16+

The summary section of the PANDA report is the school improvement summary report that has been devised by the Department for Education and Skills and Ofsted during trials with school improvement partners (SIPs). It draws mainly upon data in the remainder of the PANDA report and summarises it in tables. On inspection, you should base your preliminary judgements on the data displayed in the graphs in the PANDA report then cross-check them with the summary.

In the new-style PANDA report, the CVA information comes before the attainment data because it is the most important for gaining a quick impression of the school's performance. After skimming the contextual information about the school, this year's overall CVA graphs are always the first place to look.

TASKS

Leaf quickly through the school improvement summary in the anonymous secondary PANDA report.

Note that its cover includes the school's type and admissions policy.

Note that Key Stage 3 data precede Key Stage 4 data, and that the latter include CVA for Key Stages 2-4 and 3-4. **Note** also that CVA scores are

shown for three successive years and simple value added for one year, labelled 'SCAAT' as it is the format that appears in the School and College Achievement and Attainment Tables.

Note the range of pupil characteristics used for reporting performance by groups; prior attainment at Level 4 is included because this is the expected level for pupils to reach by the end of Key Stage 2. **Note** that the number of pupils in each group and their attainment is given. This is the only place in the PANDA report which shows attainment by groups.

Note also the tables of conversion rates in English, mathematics and science from Key Stage 2 to 3 and from Key Stage 3 to 4. These are direct conversions within the same subject. In contrast, in the primary PANDA report where subjects differ between the key stages, the only direct subject conversion is in mathematics. The other Key Stage 1 to 2 conversions are from the average of reading and writing to English, and from the average of reading, writing and mathematics to science.

Note that there are subject CVA scores for English, mathematics and science. These show added value based on the combined average points score of the three core subjects at the previous key stage, and not on a direct comparison within the same subject.

Leaf quickly through the anonymous primary PANDA report.

Spot where the first CVA graph is and **note** the type of information in each section.

Identify where the data for each key stage are placed.

Find *Table 1.1.1: Basic characteristics of your school*.
  * **note** how few schools nationally have over 20% of pupils from minority ethnic groups or for whom English is not the first language
  * **check** how the data on attendance and stability are compared with national data
  * **relate** the stability data to the mobility data in table 1.1.7 and chart 1.1.8.

Then **check** the commentary on this task in the appendix.

Do you know:

  * the information provided in the new-style PANDA report and its sequence
  * how contextual information is displayed?

Section 3   Attainment on entry

Time   **30 minutes**

Key objectives

- To interpret the graphs showing attainment on entry for each year group
- To interpret this information to judge the school's attainment on entry.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report
Reference booklet

Section detail

The PANDA report contains a set of graphs showing the attainment on entry to Key Stage 2 for primary pupils and to Key Stages 3 and 4 for secondary pupils. The graphs compare the attainment of each year group in the school, and the group that has just completed Key Stage 2 or 4, with the national data. However, no attainment data are available for use in the PANDA report for pupils currently in Key Stage 1, Year 3 and Year 7, so these must be obtained from the school.

It is important to agree early on in the inspection how the school's attainment on entry will be judged in the report and to ensure that it reflects all year groups in the school. Judgements on targets, progress and provision need to be informed by it. The prior attainment of pupils who have completed the key stage in the past and are likely to have left the school will have had an impact on the results for the past five years that are shown in the PANDA report. It does not necessarily reflect the attainment on entry of pupils currently in the school. It is important to describe the attainment on entry of all current pupils and any difference from that of previous cohorts for which standards and achievement are already known.
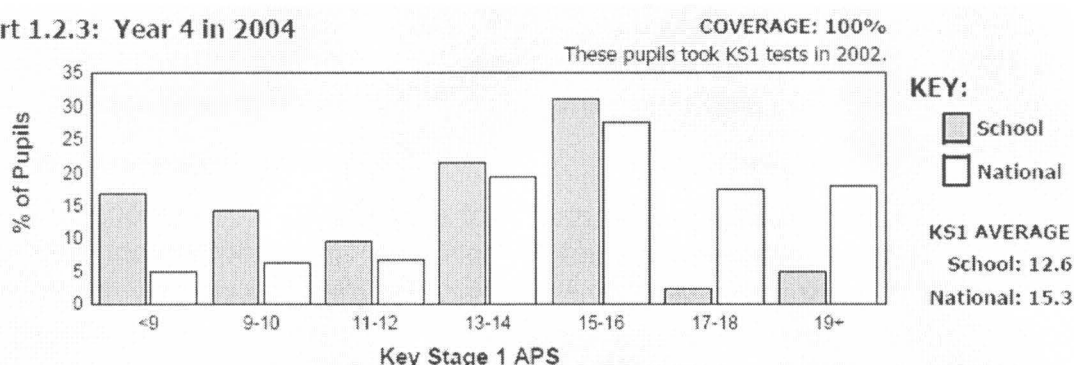
Part 1: equivalence between APS and levels   10 minutes

The graph below for Year 4 pupils' attainment at the end of Key Stage 1 shows that School 3 has lower than national proportions of pupils with high APS and correspondingly higher proportions with low APS. Its mean APS of 12.6, given to the right of the graph, is much below the national average.

Year 4 attainment at Key Stage 1 in School 3

Chart 1.2.3: Year 4 in 2004

COVERAGE: 100%
These pupils took KS1 tests in 2002.

KEY:
☐ School
☐ National

KS1 AVERAGE
School: 12.6
National: 15.3

Before reading the next paragraph, **decide** what the graph shows about the pupils' national curriculum **levels**. To do this, **refer** to Tables 1 to 4 on the equivalence between levels and points scores, and **read** sections 1.1a and 1.1b on pages 3 to 6, in the *Reference booklet*. You may find it helpful to mark on the graph the point scores that represent an average of Level 1, 2 and 3.

Fewer than 10% of Year 4 pupils in School 3 have an average attainment on entry to Key Stage 2 of 17 points or more, which is equivalent to Levels 2, 2 and 3 or above. This is far less than the national figure of over 30%. About 40% of pupils reach on average the expected level, Level 2 (or 2b), which is equivalent to 15 points. Over 15% of pupils have an APS below that equivalent to Level 1, compared with 5% nationally.

You may also find it helpful to look at Table 5 in the *Reference booklet* and the commentary beneath it to see how the 2004 national APS matches the expected levels. Note that the national average for KS1 tests in 2002 given in the attainment on entry graph for School 3 differs slightly from the value in Table 5 as it contains only the pupils who are still on roll in maintained schools in Year 4 in 2004.

Part 2: interpreting attainment on entry graphs   15 minutes

Look at the graphs of attainment on entry for School 4 in the appendix.

The graphs for primary schools display attainment at Key Stage 1, to show attainment on entry to Key Stage 2. On inspection, you should use this together with the school's own information about attainment on entry for its current Year 3 and younger pupils to judge attainment on entry overall.

Look at the graphs of attainment on entry for School 5 in the appendix.

For secondary schools, the graphs show attainment at Key Stage 2 and Key Stage 3, to show attainment on entry to Key Stage 3 and to Key Stage 4 respectively. You should base your judgement of attainment on entry to the school on the Key Stage 2 results, unless the school admits pupils only in Year 10 and above. You should use the school's data for attainment on entry for its current Year 7.

The school and national mean attainment on entry are shown alongside the graphs. The national mean values for each year group differ slightly from the mean for all pupils who were assessed because they include only those pupils who were also on roll in maintained schools in the particular year group. For example, pupils who have left the country or moved into the independent sector since taking the Key Stage 2 tests are not included in the national average for Year 10 pupils' Key Stage 2 attainment on entry.

The table below gives a rough guide to the link between the evaluation of attainment on entry and the school's points scores above and below the national average. The points indicating below and above average attainment are at least half the distance away from the national average of the points for well below and well above average. You will need to weigh up any difference between year groups in making your overall evaluation for a school.

Rough guide to link between points difference from the national average and evaluation of attainment on entry

	well below average	below average	broadly average	above average	well above average
KS1	2+	1 to 2	less than 1	1 to 2	2+
KS2	2.5+	1.25 to 2.5	less than 1.25	1.25 to 2.5	2.5+
KS3	3+	1.5 to 3	less than 1.5	1.5 to 3	3+

Look at the graphs of attainment on entry for Schools 4 to 11 in the appendix.

Match the following descriptions to the schools.

To do this you should:
- **compare** the school and national averages

- then **check** whether the bar charts show a concentration, or absence, of pupils at particular attainment levels
- **take** into account the percentage coverage, as the pupils omitted may have a different distribution of attainment.

Write the number of the school against the corresponding description.

A. The attainment on entry is well below the national average.

B. The attainment on entry is above the national average.

C. The attainment on entry is broadly average.

D. The attainment on entry has fallen since last year's Year 11 cohort and is now below average.

E. The attainment on entry each year varies between average and above average.

F. The attainment on entry has fallen from average to below average.

G. The attainment on entry is broadly average but with relatively few high attainers.

H. The attainment on entry is average but with a relatively high number of low attainers.

Then **check** the commentary on this task in the appendix.

In schools that match description G above, it is important to look beyond the average attainment on entry and check the bar chart. When evaluating the standards and provision in such a school, you would expect to find a lower proportion of pupils than average reaching the highest threshold: Level 5 at Key Stage 2, Level 7+ at Key Stage 3 or grades A*-A at Key Stage 4.

When evaluating standards and provision in schools that match description H, you would expect to find a lower proportion of pupils than average reaching the lower thresholds, such as Level 3+ at Key Stage 2 or grade G at Key Stage 4. They may have a unit for pupils with special educational needs.

Where attainment on entry varies substantially between year groups, you will need to evaluate how well provision meets the different needs of each cohort. You will also need to take the variation into account when judging how challenging the school's targets are for future years; section 4 part 5 of the module deals with this.

Where coverage is low, you need to find from the school the attainment on entry of the whole cohort and how it tracks the progress of pupils who do not have national attainment results on entry.

Part 3: judging attainment on entry   **5 minutes**

For each of the schools in the anonymous PANDA reports, **judge** the attainment on entry.

To do this:
- **refer** to Table 10 in the *Reference booklet*. It is the rough guide to the link between points difference from the national average and evaluation of attainment on entry.

Then **check** the commentary on this task in the appendix.

Review

Can you now:

- interpret the graphs showing attainment on entry for each year group
- interpret this information to judge the school's attainment on entry?

Section 4   Standards, trends and targets

Time   **130 minutes**

Key objectives

- To make a preliminary judgement on the standards reached by pupils
- To interpret the graphs of standards at thresholds and identify potential inclusion issues
- To identify trends in standards over the last five years
- To pick out the main strengths and weaknesses in standards
- To evaluate whether targets are adequately challenging.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report
Reference booklet

Section detail

In this section you will make some preliminary judgements on standards, but with little information on variations between groups of pupils, as only brief data on these are provided in the PANDA report summary.

The extracts below are from the *Guidance for inspectors on using the evaluation schedule* and the *Inspection judgements* form.

Inspectors must form a judgement for the school overall on 'the *standards* reached by learners'.

'Inspectors should evaluate:
- the **standards** learners reach as indicated by their test and examination **results**, and other available evidence, taking account of: any significant variations between groups of learners, subjects, courses and key stages; trends over time; and comparisons with all schools
- whether learners achieve their targets and whether the targets are adequately challenging.'

In judging the overall effectiveness of the school:
'Inspectors should evaluate:
- the effectiveness of any steps taken to promote improvement since the last inspection.'

In judging the leadership and management of the school:

'Inspectors should evaluate:
- how effectively leaders and managers at all levels clearly direct improvement and ...
- how effectively performance is monitored and improved through quality assurance and self-assessment.'

One source of evidence for these two judgements is the extent of improvement in standards since the last inspection and more recently.

This section builds on *Module 1: Standards in the PANDA report* and *Module 2: Trends in the PANDA report* on the *Interpreting data* CD-ROM.

TASKS

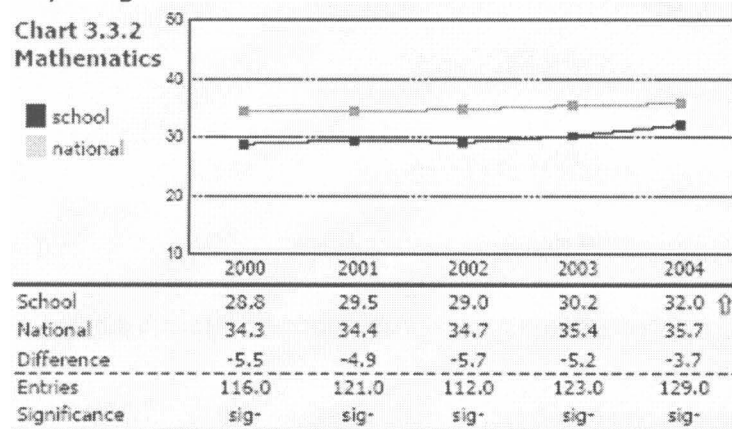### Part 1: standards and trends   10 minutes

One source of evidence for judging effectiveness is the trend in the school's standards since the last inspection. Any variation in attainment on entry during this time would need to be taken into account. For schools with standards below average, you need to decide whether the trend shows standards rising fast enough to close that gap. The standards graphs are provided for the last five years; when evaluating the trend you need to select the starting point nearest to the date of the results used in the previous inspection.

Look at graph below, of Key Stage 3 standards in mathematics for School 12.

Note that the upwards arrow on the right of the 2004 results in the table shows a significant improvement in the school's results between 2003 and 2004. The school's results also improved between 2002 and 2003, but the absence of an arrow to the right of the 2003 results shows that this improvement was not statistically significant.

Key Stage 3 standards in mathematics in School 12

Chart 3.3.2 Mathematics

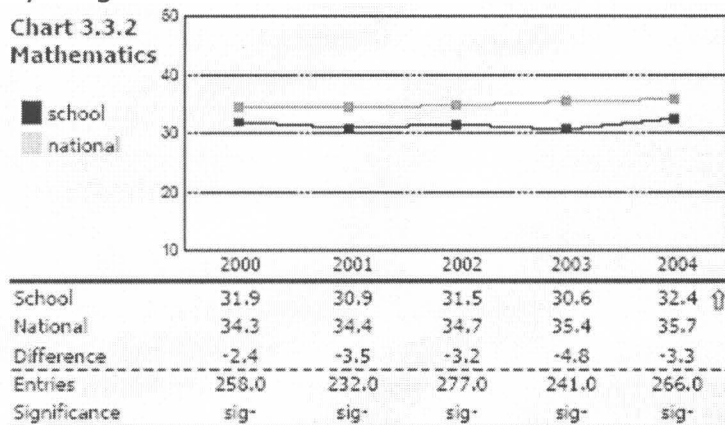|	2000	2001	2002	2003	2004
School	28.8	29.5	29.0	30.2	32.0 ⇧
National	34.3	34.4	34.7	35.4	35.7
Difference	-5.5	-4.9	-5.7	-5.2	-3.7
Entries	116.0	121.0	112.0	123.0	129.0
Significance	sig-	sig-	sig-	sig-	sig-

Before reading the commentary below, **describe** the most recent standards on School 12 and the trend over the last five years.

To do this:
- **note** where standards are significantly above or below the national average (shown by sig+ and sig- in the table)
- **consider** whether results are rising, falling or staying roughly the same and whether year-on-year changes are significant (shown by the arrows in the top row of the table)
- then **consider** whether the trend is above, below or roughly the same as the national trend
- **decide** whether the school's results are rising fast enough and what evidence this provides for judging the effectiveness of any steps taken to promote improvement since the last inspection (assuming it was five years ago).

Standards in School 12 are significantly below the national average and have been so for the past five years. They have risen faster than the national trend, but this has not brought them into line with the national average. The rise in standards closed the gap from 5.5 points to 3.7 points, a **relative** improvement of 1.8 points. Between 2003 and 2004 the rise was significant, as shown by the arrow in the table. Table 7a in the *Reference booklet* shows that the rise of 1.8 points is equivalent to one level for over a quarter of the pupils. If attainment on entry was constant, this shows evidence of satisfactory improvement in mathematics standards since the last inspection.

Key Stage 3 standards in mathematics in School 13

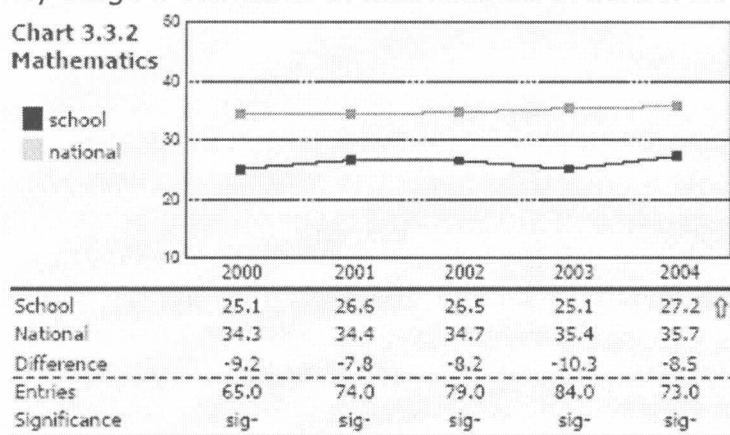|	2000	2001	2002	2003	2004
School	31.9	30.9	31.5	30.6	32.4 ⇧
National	34.3	34.4	34.7	35.4	35.7
Difference	-2.4	-3.5	-3.2	-4.8	-3.3
Entries	258.0	232.0	277.0	241.0	266.0
Significance	sig-	sig-	sig-	sig-	sig-

Note that it is possible for a school's results to rise, but at less than the national rate; the trend in the school's results would then be below the national trend. If attainment on entry had remained constant, and standards are below the national average, the improvement in the school's standards may provide evidence of the impact of steps taken by the school to raise standards, depending upon the size of the gap and extent to which it has been closed.

For School 13, above, the arrow in the top row of the table shows a significant rise between 2003 and 2004, but this was after a large drop in 2003. In spite of its standards rising from 31.9 to 32.4, the national standards have risen much faster and standards are now further below average than in 2000. However, if there is a convincing explanation for the dip in 2003, such as lower attainment on entry, the school has maintained roughly similar standards in relation to the national average since 2001. There is not evidence of it closing the gap, or of improvement since 2000.

For School 14, below, there is little evidence of improvement resulting from any steps the school may have taken; in the last two years national results have risen much more than the school's.

Key Stage 3 standards in mathematics in School 14

	2000	2001	2002	2003	2004
School	25.1	26.6	26.5	25.1	27.2 ⇧
National	34.3	34.4	34.7	35.4	35.7
Difference	-9.2	-7.8	-8.2	-10.3	-8.5
Entries	65.0	74.0	79.0	84.0	73.0
Significance	sig-	sig-	sig-	sig-	sig-

There are examples of different trends that you may wish to refer to in *Module 2: Trends in the PANDA report* on the *Interpreting data* CD-ROM.

Part 2: evaluating standards   70 minutes

For an inspection you will need to make a judgement on 'the standards reached by learners' for the school overall, rather than for each key stage. This should give most weight to standards at the final key stage, from Key Stages 1 to 4, in the school. It is based substantially on the data for the previous year's cohort, but may be augmented by inspection evidence of current standards, for example in very small primary schools. It is a judgement of the **latest standards**, not standards over the last five years.

To make the judgement, you need to consider variation between groups and subjects. The data the PANDA report provides for this are:
- attainment graphs for each core subject at Key Stages 1-3
- attainment graphs for English and mathematics at Key Stage 4
- attainment tables for GCSE subjects, separately for boys and girls.

The school improvement summary at the front of the PANDA report also gives attainment in APS for groups, by prior attainment, gender, free school meal entitlement, ethnicity, special educational need (SEN) and first language.

Where variation between subjects or groups is large, the standards are likely to be judged to be lower than the overall school APS may suggest. For grade 1, the standards would be consistently high, and sufficiently above average to be exceptional educationally. In a large school they would also be statistically significantly above average, but for small cohorts the method of calculating significance makes it unlikely, and sometimes impossible, for the results to be statistically significantly above average. In such cases, consistency of results over time and the educational importance of the results would underpin the judgement.

In School 15, shown below, attainment has remained significantly above average and is now 3.7 points above average. If the 2004 standards were consistently this far above average across subjects and groups, the standards reached by pupils at Key Stage 2 would support a grade of either 1 or 2, depending upon whether the gap of 3.7 points represents an educationally important difference from average that makes it exceptional.

Key Stage 2 attainment in School 15
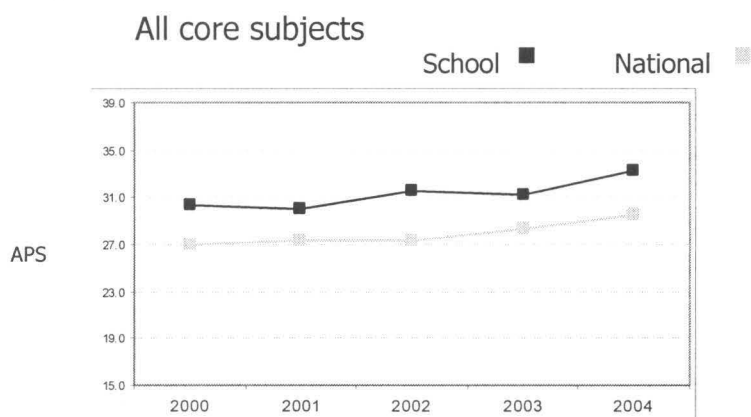
	2000	2001	2002	2003	2004	
School	30.4	30.0	31.6	31.2	33.2	⇧
National	27.0	27.3	27.3	28.4	29.5	
Difference	3.4	2.7	4.3	2.8	3.7	
Entries	59	61	60	60	60	
Significance	sig+	sig+	sig+	sig+	sig+	

Exceptional standards

The following are **rough** guides for identifying **standards** that are exceptional in educational terms in relation to national averages:
- at Key Stage 1, a difference from the national average of one level of attainment for at least **one third** of the pupils
- at Key Stage 3, a difference from the national average of one level of attainment for at least **one half** of the pupils

- at Key Stage 2, a difference from the national average of one level of attainment that is midway between these, in other words for at least **five twelfths** of pupils,
- at Key Stage 4, a difference from the national average of at least one grade in attainment for **all** pupils.

At Key Stage 1, this is when at least one third of pupils attain one level above the national average, or one level below the national average. For an individual subject this is one level above or below the national average; for overall core APS it is an average of one level in each of the three subjects above or below the national average. (Table 5 in the *Reference booklet* shows the national average at each key stage.)

At Key Stage 4, this is when all pupils attain at least one grade above the national average, or one grade below the national average. For an individual subject this is one grade above or below the national average; for average capped total points score it is an average of one grade in each of the eight subjects above or below the national average shown in. (Table 11b in the *Reference booklet* shows the national average.)

You need to convert the proportions in the rough guide into national curriculum points scores to evaluate a school's standards.

To help you with this, **read** sections 1.1c (KS1-3) and 1.2b (KS4) in the *Reference booklet*. They include:
- the rough guides above
- Tables 7 and 12 showing conversions from points to differences in levels and GCSE grades for proportions of pupils
- summaries of point score equivalences in Tables 8 and 13.

The two pages at the back of the *Reference booklet* are intended as an aide memoir for use on inspection. **Look** at Table 24 at the back of the *Reference booklet*, it includes the following summary of equivalences.

Rough guide to exceptionally high or low performance at each key stage

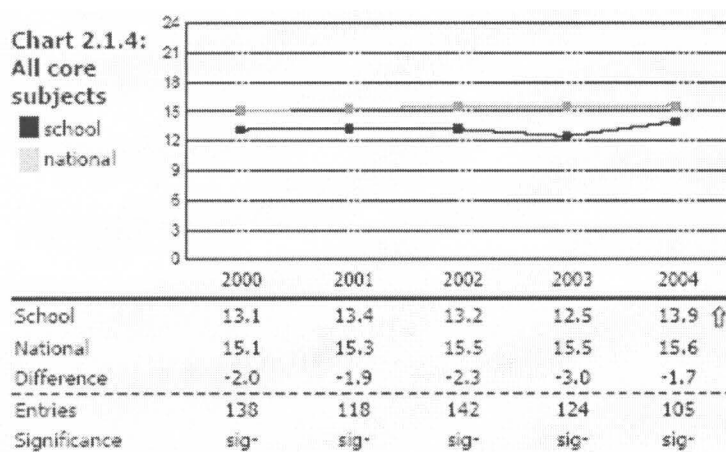|	Proportion of pupils gaining one level different*	Points score difference for an individual subject	Difference in overall core APS at KS1 to 3 or capped total score at KS4
KS1 attainment	1/3	2	2
KS2 attainment	5/12	2.5	2.5
KS3 attainment	1/2	3	3
KS4 attainment	all	6	48
KS4 attainment (**old** scoring system)	all	1	8

* difference from national average; you can also use this guide to judge the educational importance of other differences, such as year-on-year or between groups or subjects.

The average capped total points score is the total for the best 8 subjects. It is explained in *Information sheet 2: explanation of KS4 scoring system* in the *Interpreting data* CD-ROM.

From the table above, you can see that School 15's Key Stage 2 points difference from average of 3.7 for all core subjects is greater than the rough guide of 2.5 points. The school has educationally exceptional attainment at Key Stage 2. If this were consistently matched for all Key Stage 1 subjects and groups, the standards reached by its pupils would be graded 1.

Look now at the graph below for School 16.

Key Stage 1 attainment in School 16

	2000	2001	2002	2003	2004
School	13.1	13.4	13.2	12.5	13.9 ⇧
National	15.1	15.3	15.5	15.5	15.6
Difference	-2.0	-1.9	-2.3	-3.0	-1.7
Entries	138	118	142	124	105
Significance	sig-	sig-	sig-	sig-	sig-

Attainment has risen significantly in the last year, but after a drop. It is significantly below average. If it were similar across key stages, subjects and groups, the standards reached by pupils would be graded either 3 or 4, depending upon the educational importance of the difference.

Check the rough guide table on the previous page to find whether 1.7 points below average at Key Stage 1 is deemed to be exceptional. As it is not as far as 2 points below, the standards in this key stage are not exceptionally low, so should be graded 3. In a school with Key Stage 1 and 2 pupils, the standards at the higher key stage would carry most weight in the school judgement.
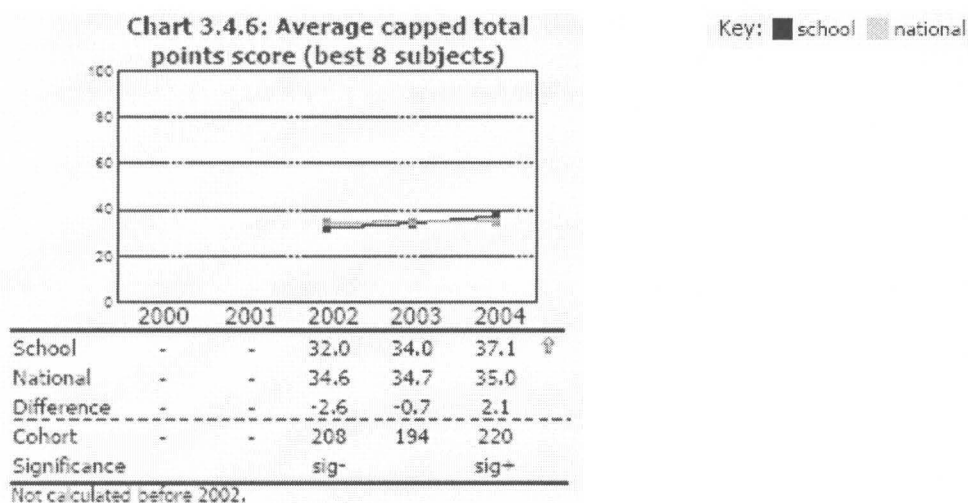
When describing a school's standards in the report, 'inadequate' is not an appropriate term for describing standards that are graded 4. The footnote in the inspection judgements form gives the wording that describes each of the grades for standards. It is:
  Grade 1:   exceptionally and consistently high
  Grade 2:   generally above average with none significantly below average
  Grade 3:   broadly average
  Grade 4:   exceptionally low.

Using the national distribution graphs

Look at the graph below for School 17.

Key Stage 4 attainment in School 17

Chart 3.4.6: Average capped total points score (best 8 subjects)

Key: ■ school ░ national

	2000	2001	2002	2003	2004
School	-	-	32.0	34.0	37.1 ⇑
National	-	-	34.6	34.7	35.0
Difference	-	-	-2.6	-0.7	2.1
Cohort	-	-	208	194	220
Significance			sig-		sig+

Not calculated before 2002.

Attainment in 2004 in School 17 is significantly above average but only by a few points. Comparing the school's attainment with the national distribution can show whether its results are exceptional (different from most schools, including those near to it in the distribution).

For 2004 results, the overall attainment at Key Stage 4 is shown using the old point-scoring system so that changes since previous years may be seen. For 2005 results it is planned to show these results using the current scoring system.

Look at Table 11a and **read** section 1.2d in the *Reference booklet* to see how the rough guide for exceptional performance links to the old scoring system. The bottom two rows show how the total for the best 8 subjects links to grades.

Look at Tables 15b and 12b. They show that the rough guide for exceptional attainment for average capped total points score indicates at least an 8 point difference from average using old points and a 48 point difference (six times as much) from average using the current point-scoring system.

The graph of the national distribution gives a rough idea of where the results of schools with points scores indicating exceptional attainment lie.

Look at the 'caterpillar' graph of the national distribution of average capped total points scores in the *Reference booklet*. It is Graph 9 in section 4. It uses the old scoring system. The curve is made up of every school's attainment score plotted in rank order. The horizontal axis is at the national mean score of 35.0. You cannot convert old scores directly into the current scoring system without pupil-level data, as explained in *Information sheet 2* in the *Interpreting data* CD-ROM. The national distribution using the current scoring system is shown in Graph 8 and has a mean score of 281.7.

Identify the parts of each curve showing schools in which overall standards are likely to be graded 1 or 4, if they are consistent throughout the school.

These are the sections of the graph that rise or fall rapidly at each end of the graph. The attainment in these schools is substantially different from that in the schools plotted nearby. Elsewhere on the graph the standards change gradually from school to school, so one school's attainment is very similar to that of many other schools plotted near to it and is therefore not exceptional.

Look again at Graph 9 of the national distribution of average capped total points scores using the old scoring system, to see roughly the proportion of schools with attainment at least 8 points above average, which would represent exceptional standards. School 17's attainment is roughly 2 points above average. Check on Graph 9 to see that this would not place its results on the steep part of the national graph in the top roughly 8% of results. If attainment were similar at both key stages for subjects and groups in the school, the standards reached by pupils would be graded 2.

The national distribution graph has dotted lines at 10% intervals to assist you in estimating a school's percentile rank. For School 17, **check** on the graph that its rank is roughly 40, because 40% of schools have higher attainment than it. You should not aim for utter precision in estimating a school's rank from the graph because, if its actual standards lay somewhere else within its 95% confidence interval, its rank may change considerably. The effect of the size of a school's confidence interval on its range of possible ranks is dealt with in the CVA section of this module.

Checking the national proportion of significant attainment

There is a high proportion of schools with sig+ attainment; only a few of these will be graded 1 for standards. Similarly there is a large proportion of schools with sig- attainment, only a few of which will be graded 4 for standards.

Look at Table 18 in the *Reference booklet* to see the percentage of schools with points scores significantly different from average. For overall scores it is roughly 65% of schools at Key Stages 1 and 2, 85% of schools at Key Stage 3, and 75% of schools at Key Stage 4.

You need to bear in mind that there are two places in the attainment graphs where sig+ does NOT refer to above average performance. At Key Stage 4, a sig+ percentage of pupils achieving no passes would reflect a higher proportion of pupils than expected nationally passing no GCSE or equivalent qualifications. It represents below average attainment; sig- shows above average results. At Key Stages 1 to 3 when the percentage of pupils attaining below the lowest level shown in the table is sig+, for example the percentage at <L1 (below Level 1), this indicates that more pupils than expected attained below Level 1 and is consequently below average attainment.

Using the Reference booklet

Read section 5 in the *Reference booklet*. These two pages are intended as an aide memoir for use during inspection.

It contains brief notes for judging standards and progress for you to use as an aide memoir throughout this module and on inspection. They give the:
- rough guide to judging whether performance is exceptional
- data indicators to inform your judgements
- steps to take when grading.

Exceptional performance may be exceptionally high or exceptionally low.

In the *Reference booklet* also **familiarise** yourself with:
- the 'caterpillar' graphs showing the national distributions of attainment at each key stage, Graphs 5 to 9
- sections 1.1c (KS1-3) and 1.2b (KS4) which include tables and explanations to help you judge the educational importance of differences in points scores
- sections 2.2 and 2.3 that show the percentage of schools in which attainment is significantly different from average.

The task includes graphs for separate core subjects to enable you to take account of subject variation in making your judgement on standards reached by pupils. It provides practice with key stage judgements but, for inspections, only whole school and 16-19 judgements are recorded.

Look at the graphs of standards for Schools 18 – 23 in the appendix.

Make a preliminary judgement on whether the standards reached in 2004 by pupils at the key stage shown in each school should be graded 1, 2, 3 or 4.

The factors to consider are the titles of the columns in Table 25. For each grade, the indicators in **each** column must be present:
- **educational importance** of the difference from the national average
- **variation** between subjects (no other group information is provided)
- **statistical significance**, bearing in mind the rough percentage of schools with attainment that is sig+ or sig-, as shown in the *Reference booklet*.

To do this:
- **refer** to the notes for judging standards and progress in section 5 of the *Reference booklet*, in particular the rough guide (Table 24) and data indicators (Table 25)
- **consider** how many points above or below the national average the school's results are

- **consult** the national distribution 'caterpillar' graphs for attainment in the *Reference booklet* (provided only for overall APS and average capped total points) to estimate very roughly where the school's results lie
- **check** whether any attainment is significantly different from average
- **consider** this alongside Table 18 in the *Reference booklet* which shows the proportions of schools with significantly different APS results from the national average
- **note** any substantial differences between subjects.

You may find it helpful to **check** the commentary for School 18 in the appendix before forming a judgement for the other schools.

Part 3: standards at thresholds   **10 minutes**

Standards at level thresholds for Key Stages 1, 2 and 3 are shown by cumulative distribution graphs. These enable you to see quickly the percentage of pupils that reaches each threshold, for example those that attain at least Level 2c. They also show whether these percentages are significantly different from the national average.

Attainment in writing in School 24

Chart 2.1.6: Writing

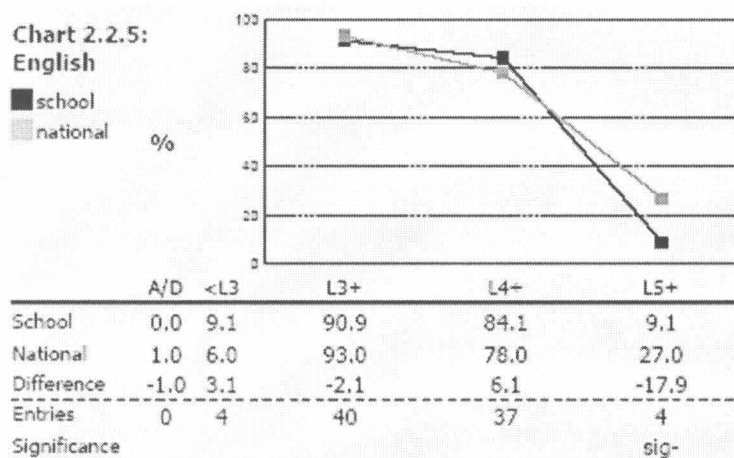|	A/D	<L1	L1+	L2C+	L2B+	L2A+	L3+
School	0.0	0.0	100.0	96.6	85.0	53.3	26.7
National	0.0	5.0	95.0	82.0	62.0	37.0	16.0
Difference	0.0	-5.0	5.0	14.6	23.0	16.3	10.7
Entries	0	0	60	58	51	32	16
Significance				sig+	sig+	sig+	sig+
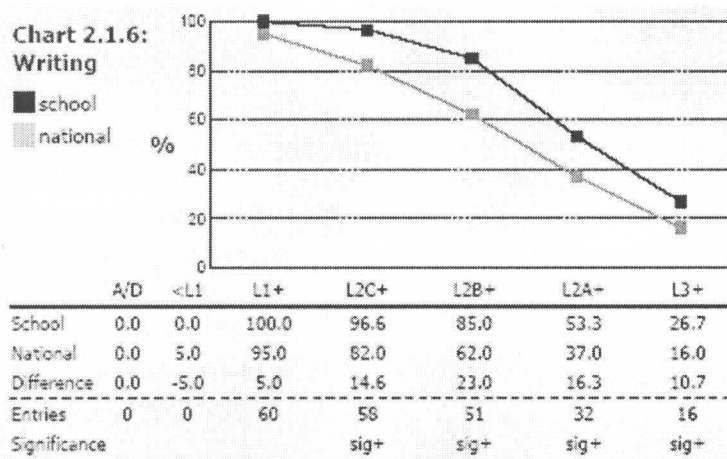
School 24 has a significantly high proportion of pupils in relation to the national average reaching Level 2b in writing, the national expected level, and reaching the higher levels.

Table 19 in the *Reference booklet* shows that only 9% of schools have sig+ attainment in writing at Level 2b+ and 6% at Level 3+ so this is a high level of attainment for School 24. Nevertheless, it does not mean that we can be certain that the school's results were in the top 6% nationally at Level 3+, because small schools with a higher proportion of pupils reaching Level 3+ would have had too few pupils at this level for their results to be significant.

In School 24, all pupils have been entered and reached at least Level 1. The left column headed A/D shows pupils who were absent or disapplied, and the next column shows those who were working within Level 1. When there are entries in these columns you will need to find out how the school has evaluated the standards and progress of these pupils, and check whether they are referred to in the self evaluation form (SEF). Such entries also identify issues of inclusion, for groups and/or individual pupils, for you to follow up.

Attainment in KS2 English in School 25

	A/D	<L3	L3+	L4+	L5+
School	0.0	9.1	90.9	84.1	9.1
National	1.0	6.0	93.0	78.0	27.0
Difference	-1.0	3.1	-2.1	6.1	-17.9
Entries	0	4	40	37	4
Significance					sig-

Look at the cumulative distribution graph for School 25.

Describe the standards in English at Key Stage 2 and identify any potential inclusion issues.

To do this:
- **note** for which levels the cumulative percentage is significantly above or below the national average and **compare** this with the national proportion shown in Table 19 in the *Reference booklet*
- **consider** the proportion of pupils below the lowest level and who were absent or disapplied
- **decide** whether there is a particularly high percentage of pupils just reaching the Level 4+ threshold (this may show effective teaching to reach it or may reflect a lack of inclusion of, or challenge for, other pupils as a result of this focus)
- **check** whether there is a relatively low percentage reaching the highest level or the lower levels that might suggest any lack of inclusion. (You will later be able to check the progress of different attainment groups.)

Then **check** the commentary on this task in the appendix.

Part 4: variation between key stages and subjects   30 minutes

This task involves using all of the relevant data in the anonymous secondary PANDA report to judge standards reached by pupils in 2004. It builds up the evaluation through separate activities, assuming that you are familiar with interpreting Key Stage 4 data. If you wish to refresh your memory on evaluating standards at Key Stage 4, please refer to *Module 1: standards in the PANDA report* on the *Interpreting data* CD-ROM.

The standards at the highest compulsory key stage carry most weight, but substantial variation between key stages is likely to lead to a lower judgement than when standards are consistent. You should make comparisons between key stages of overall standards and of standards in the same subject at each key stage. It is also helpful to check if relative strengths within subjects at the lower key stage are maintained at the higher key stage; this gives additional information about curricular, middle management and teaching strengths. Comparisons for English and mathematics are relatively straightforward, but for science there are no Key Stage 1 data nor Key Stage 4 APS graphs in the PANDA report. For the 2005 PANDA report it is hoped that there will be a graph for Key Stage 4 science APS.

Part 4a: comparing standards at Key Stages 3 and 4

Look at all eight of the Key Stage 4 attainment graphs in the anonymous secondary PANDA report. **Look** also at the national distribution 'caterpillar' graph for standards at Key Stage 4 in the *Reference booklet* to inform yourself very roughly where the school's attainment lies, bearing in mind that it uses the current scoring system. You should not try to do this too precisely as the graphs do not show the confidence intervals within which we are 95% certain that the school's actual results lie.

Make a preliminary judgement of the 2004 attainment at Key Stage 4. To do this, **consider** in this order:
- the average capped total points score and the educational importance of its difference from the national average – **this carries the most weight** as it takes into account attainment at all levels, not only at thresholds
- the average uncapped total points score
- the 5+ A*-C threshold, bearing in mind the importance of the core subjects
- the 5+ A*-G threshold (significant results are unlikely for this graph as percentages lie close to 100%)
- the core subject graphs and their impact on the 5+ A*-C and 5+ A*-G threshold graphs
- the percentage of no passes and any inclusion issues this raises; this is the percentage of the cohort who were not entered or did not pass any subjects (note that sig- shows results that are significantly above

average, reflecting fewer pupils than average achieving no passes; it occurs relatively rarely as the percentages are close to zero).

Decide whether there is substantial variation between Key Stages 3 and 4. To do this:
- **compare** the graphs for overall standards at KS3 and KS4 (at KS3 use the graph for all core subjects APS, at KS4 use the average capped total points score)
- **compare** the KS4 percentage of no passes with KS3 percentages of pupils absent or disapplied or at low levels as shown in the subject cumulative distribution graphs, and **note** any inclusion issues
- **compare** the graphs for English and mathematics APS at KS3 and KS4
- **compare** the science standards at KS3 and KS4 (at KS4 see the 'sig' columns for A*-A and A*-C in the GCSE subject table for all pupils, and at KS3 the 'sig' row in the table under the science APS graph)
- **check** whether the core subject relative strengths and weaknesses at KS3 are the same at KS4.

Part 4b: GCSE subjects

Some schools focus strongly on the core subjects, while others devote attention to entering pupils for a range of subjects that match their aptitudes. This part of the task focuses on identifying whether there are any substantial differences between Key Stage 4 standards in the core subjects and in other subjects, including standards reached by the highest attainers. Training on interpreting GCSE subject results, including the relative performance indicator (RPI), is given in *Module 1: standards in the PANDA report* on the *Interpreting data* CD-ROM.

Look at the GCSE subject table for all pupils which is near the back of the anonymous secondary PANDA report.

Evaluate the school's standards for pupils gaining grades A*-A. To do this:
- **glance** down the 'sig' column for variation between subjects and at the bottom row for the total. (The KS4 graphs do not show information about reaching this higher threshold, so this table is where you can find out about standards of the highest attainers in the school.)

Check the percentage entry for the core subjects and **glance** down the column headed % fail, which shows the percentage of pupils entered who did not pass. **Compare** these with the national figures and **identify** any potential inclusion issues, such as 100% or very low entry by the school.

Check the percentage of pupils who reach grade C in each of the core subjects.

Decide whether there is substantial variation between GCSE subjects. To do this:

- **identify** subjects that are particularly strong or weak in comparison with others at the school (the final two columns, for relative performance indicator 'RPI', show this by sig+ and sig-) (Note the PANDA report does not give details of any non-GCSE course.)
- **check** whether any of these subjects have a RPI which may be exceptional (RPI of +6 points represents on average one grade for every pupil above the national subject difference between this subject and others, but may be mainly due to a particularly small or unrepresentative group of pupils having been entered for the subject)
- **take into account** variation in the percentages reaching the A*-C and A*-A thresholds.

Part 4c: groups

Look at the tables for the attainment of different groups in the anonymous secondary school improvement summary report. At Key Stage 4, they use the current scoring system.

Decide whether there is substantial variation between the standards in any groups at KS3 or at KS4.

Look also at the separate tables for boys and girls of the GCSE subject results which are at the back of the PANDA report. **Glance** at the core subject APS and thresholds, and at the totals in the bottom row.

Decide whether there are any substantial differences between KS4 standards for boys and girls in relation to national averages. **Focus** on the core subjects and on the totals for A*-A and other thresholds.

Note also whether there are any differences between genders in the take-up of subjects that may raise issues of inclusion.

Part 4d: overall standards

Make a judgement on standards reached by pupils in the school.

Take into account whether there is substantial variation:

- between key stages overall and in the core subjects
- between subjects within either key stage
- between groups.

Then **check** the commentary on this task in the appendix.

Part 5: challenging targets   **10 minutes**

The attainment on entry graphs are a helpful tool for evaluating whether targets are adequately challenging. For Key Stage 3 targets, you can check the attainment on entry graph of the cohort most recently tested against the percentage of pupils who achieved Level 5+ to estimate the lowest Key Stage 2 APS from which a pupil reached Level 5. You can then apply this to the attainment on entry graph for next year's Year 9 cohort and expect some improvement year on year.

Look at the information on School 26 in the appendix. It includes the school's Key Stage 3 targets for Level 5+ and Level 6+ in English for 2005 and 2006.

Decide whether these targets are adequately challenging.

To do this, **consider**:
- the graph of the trend in average points score over the past 5 years (note that this may be different from the trend in meeting thresholds)
- the cumulative distribution graphs for last year showing the percentages reaching these thresholds and the level immediately below
- the percentages reaching the Level 5+ and Level 6+ threshold in the last 3 years
- the graphs for attainment on entry to ascertain how it has changed and the percentage of pupils who should be targeting these levels based on their Key Stage 2 APS.

Then **check** the commentary on this task in the appendix.

Note that the data in the PANDA report do not provide information on whether pupils have met their targets. However, if targets are set to match the average progress expected nationally, given pupils' starting points, the CVA graph of each pupil's results will show whether each pupil has met this target. There is guidance on using this graph in section 6 of the module.

Review

Can you now:

- make a preliminary judgement on the standards reached by pupils
- interpret the graphs of standards at thresholds and identify potential inclusion issues
- identify trends in standards over the last five years
- pick out the main strengths and weaknesses in standards
- evaluate whether targets are adequately challenging?

Section 5   Progress in the whole school

Time   **120 minutes**

Key objectives

- To recognise that the CVA score is a measure of progress that is attributable to the school
- To use the school's CVA 'snake' graph as the most important graph in the PANDA report
- To evaluate whole-school progress
- To evaluate progress in subjects and differences in progress between subjects
- To interpret the educational importance and statistical significance of a school's contextual value added (CVA) score
- To evaluate a school's CVA in relation to its attainment.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report
Reference booklet

Section detail

This section focuses on whole-school progress. Section 6 deals with progress of groups. When judging progress and achievement in a school, the data for both the whole school and groups must be taken into account.

The extracts below are from the *Guidance for inspectors on using the evaluation schedule* and the *Inspection judgements* form.

Inspectors must judge 'how well learners make *progress*, taking account of any significant variations between groups of learners'. They must also judge 'how well learners with learning difficulties and disabilities make progress'. After making these two judgements, and the judgement on the standards reached by learners, inspectors must form an overall judgement in answer to 'How well do learners achieve?' This is based upon how well learners make progress and must appear in the text of the report.

'Inspectors should evaluate:
- whether learners achieve their targets and whether the targets are adequately challenging
- how well learners **progress** relative to their starting points and capabilities, with any significant variations between groups of learners (making clear whether there is any **underachievement** generally or among particular groups who could be doing better).'

The overall judgement on progress should take account of any differences in progress made by learners with learning difficulties and disabilities, and is likely to be the same as the achievement judgement.

The grade descriptions for achievement and standards are reproduced in full below.

'Evaluating achievement and standards (based upon how well learners make progress)

- Outstanding (1) - Progress is at least good in all or nearly all respects and is exemplary in significant elements, as reflected in contextual value added measures.
- Good (2) - Learners meet challenging targets and, in relation to their capability and starting points, they achieve high standards. Most groups of learners, including those with learning difficulties and disabilities, make at least good progress and some may make very good progress, as reflected in contextual value added measures. Learners are gaining knowledge, skills and understanding at a good rate across all key stages. Most subjects and courses perform well, and some better than this, with nothing that is unsatisfactory.
- Satisfactory (3) - Progress is inadequate in no major respect, and may be good in some respects, as reflected in contextual value added measures.
- Inadequate (4) - A significant number of learners do not meet targets that are adequately challenging. Contextual value added measures indicate slow progress. Considerable numbers of pupils underachieve, or particular groups of pupils underachieve significantly. The pace of learning is insufficient for learners to make satisfactory gains in knowledge, skills and understanding, especially in the core subjects. Learners underachieve in one or more key stages. Performance in a number of subjects and courses is unsatisfactory. **Overall, the standards that learners achieve are not high enough when set against their capability and starting points**.'

When evaluating the extent of improvement as part of the judgements on overall effectiveness of the school and on leadership and management, improvement in progress is a key factor.

TASKS

Part 1   **20 minutes**

The overall CVA graph – the 'snake' plot

You may find it helpful to look back at the description of the CVA graph and 95% confidence interval in section 1 of this module. The size of the

confidence interval varies with cohort size: the smaller the cohort, the larger the interval, as shown in Table 23 in the *Reference booklet*. In the PANDA report the CVA score and size of the confidence interval are given in a table on the page before the CVA graphs, so you will not need to estimate them. Nevertheless, it is quicker to gain a rough impression of them from the graph. Remember that the size of the confidence interval is **half** the width of the bar shown on the graph; it is the distance above or below the CVA score that the bar stretches.

The graph below, for School 27 shown in black, shows that it has a CVA score slightly above 100 but that its confidence interval crosses the national average line (this is assigned the value 100 for KS1-2). Consequently we are not 95% sure that the actual progress contributed by the school is above average. We can only say that its CVA score is not significantly different from average. The relatively narrow confidence interval shows that the school is comparatively large.

From the scale along the top of the graphs you can see that there are roughly 35% of schools with CVA score above that of School 27, so its percentile rank is roughly 35.

School 27 and national KS1-2 overall CVA distribution
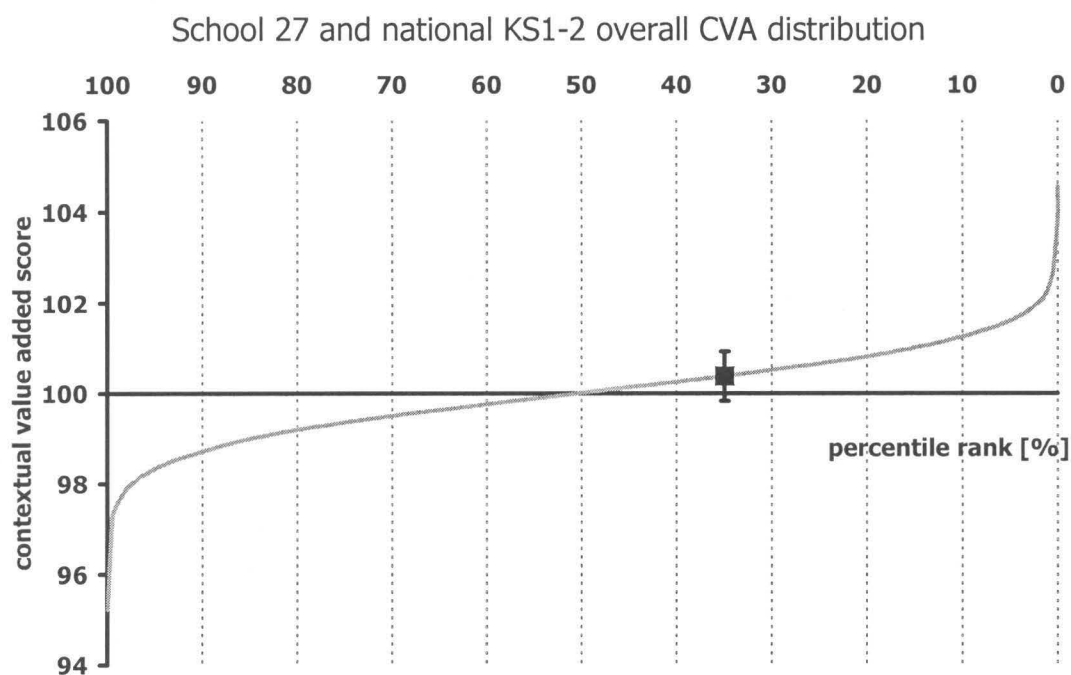
The curve is made up from the CVA scores of all schools plotted in rank order. Note that the 90th percentile school has a CVA score slightly less than 99, which is roughly one below average. The 10th percentile school has a CVA score of roughly one above average, so the CVA scores for the middle 80% of schools fall in this narrow range between roughly 99 and 101. The graph also shows the big range of CVA scores for the other 20% of schools; there is a large difference between CVA scores for the 100th and 90th percentile schools and between CVA scores for the 10th and 0th percentile schools.

The overall CVA graphs should be used as the main guides to the overall judgement on progress, augmented by CVA for subjects and groups. They may be supported by more recent results that have not yet been published in the PANDA report and by first-hand evidence.

CVA graphs are based on average points scores (APS) at Key Stages 1 to 3 and average capped total points score at Key Stage 4 (scores for the best 8 subjects – these are explained in *Information sheet 2: explanation of KS4 scoring system* in the *Interpreting data* CD-ROM). At KS4 the current point-scoring system is used. For secondary schools there are CVA graphs for KS2-4, KS3-4 and KS2-3. You should give greatest weight to KS2-4 as it represents progress throughout the school, but bear in mind that it includes the progress of the cohort from Year 7 at least five years ago when the school may have been very different. Whilst the KS3-4 CVA more effectively reflects the recent progress of the cohort, it may be unduly inflated by low Key Stage 3 results.

Schools may have a range of alternative methods for monitoring and displaying progress. They are generally designed for assisting the school in identifying strengths and weaknesses, setting targets and raising standards. They are not designed for use in inspection judgements on standards and progress. Nevertheless, the effectiveness of the way the school has applied the information they give to the raising of standards will inform the inspection judgement on leadership and management.

National distribution graphs

Each school's overall CVA graphs show the national distribution as well as the school's score. For quick reference, the national distribution 'caterpillar' graphs for KS1-2 and KS2-4 are also provided in the *Reference booklet*.

Look at the national distribution 'caterpillar' graphs for overall CVA scores for KS1-2 and KS2-4, based on mainstream maintained schools. These are Graphs 1 and 2 in section 4 of the *Reference booklet*. The dark curve is made up of every school's CVA score plotted in rank order and the grey region shows the widest confidence interval for each CVA score. Note that the national average is assigned the value 100 for KS1-2 and 1000 for KS2-4. The horizontal axis through this value is sometimes referred to as the average axis or line.

Identify the parts of each curve showing schools in which overall progress is likely to be outstanding or inadequate.

These are the sections of the graph that rise or fall rapidly. You can see that the top two percent of schools have very much higher CVA scores than average. The graphs are not quite symmetrical; they are less steep at the lower end. Nevertheless, the curves become much steeper than elsewhere in roughly the top and bottom five percent for KS1-2 CVA and ten percent for

KS2-4. Schools on these two parts of the curve have very different scores from schools plotted elsewhere. The CVA scores change much more gradually from school to school elsewhere on the graph, so none of these schools has an exceptional CVA score, in other words a score that is substantially different from those of the schools plotted nearby on the curve.

The national graphs cannot give a clear indication of the proportion of schools that have significant CVA scores as there is not enough space on them to print the result of each school separately. Schools with narrow confidence intervals that are not at the extremes of the distribution may not be visible on the graph because an adjacent school with a lager confidence interval has been printed on top of it. Table 17 in the *Reference booklet* shows that roughly equal proportions of schools (23%) have significant positive or significant negative KS1-2 CVA scores. These percentages are roughly 27% for KS2-4 CVA scores. At both sets of key stages, roughly half of schools have a CVA score that is not significantly different from average.

Schools with significant CVA scores are not necessarily the schools with the highest and lowest CVA scores. The following examples illustrate why.

It is possible for a small school at the 23% percentile CVA to have a wide confidence interval that crosses the axis, and consequently not have a significant CVA score. Alternatively, a very large school with roughly a 28th percentile CVA score could have a narrow confidence interval that does not cross the average line.

Example 1

If you are inspecting a school with a cohort of 14 pupils which has a high KS1-2 CVA score of 100.9, this will not be statistically significant.

Look in the *Reference booklet* at Graph 1, the national distribution 'caterpillar' graph for KS1-2 CVA. You can see that this school's CVA score lies near to the 10th percentile.

Before reading the commentary below, **find out** why the score is not statistically significant.
To do this:
- **look** at Table 23 in the *Reference booklet*
- **check** the '95% CI' column for KS1-2.

Table 23 shows that a primary school cohort of 15 has a confidence interval of 0.94, and a cohort of 10 has a confidence interval of 1.10. Therefore the size of confidence interval for the school with 14 pupils is between these, say at 0.97. The school's CVA score is 100.9, so its interval stretches from 100.9 - 0.97 to 100.9 + 0.97; in other words it stretches below 100 and crosses the average axis. Consequently, the school's CVA score is not significant.

Although the small size of this school prevents its CVA score from being significant, its progress may still be judged to be outstanding. The score itself is high; if this were the case in previous years and for all groups and subjects, then the progress made by pupils is likely to be outstanding. The following sections in the module explain how to judge whether the CVA score is educationally exceptional, a key indicator in identifying outstanding progress.

Example 2

If you are inspecting a school with a cohort of 220 pupils which has a significant KS2-4 CVA score of 991, this score will not be in the bottom 27%.

Look in the *Reference booklet* at Graph 2, the national distribution 'caterpillar' graph for KS2-4 CVA. You can see that this school's CVA score lies near to the 70th percentile, which takes it just above the bottom 27%.

Before reading the commentary below, **find out** why the score is significant. To do this:
- **look** at Table 23 in the *Reference booklet*
- **check** the '95% CI' column for KS2-4.

The confidence interval for a secondary school cohort of 220 is between 9.10 and 8.19, at roughly 8.8. The school's CVA score is 991, so its confidence interval stretches from 991 - 8.8 to 991 + 8.8. Its highest point is at 999.8, which is slightly less than 1000. Consequently the confidence interval does not cross the average axis.

This school has a CVA score significantly below average, but the score itself is not very low. The large cohort size has caused the score to be significant. As the score is not exceptionally low, progress would not be judged to be inadequate, grade 4. If none of the school's CVA scores for subjects or groups were exceptionally low, then the progress made by pupils is likely to be graded 3, satisfactory.

Part 2   **15 minutes**

How CVA factors are taken into account

You may find that a school's CVA score does not initially accord with the progress you observe in the school. This may be due to the particular characteristics of pupils in the school, such as a high proportion of pupils from a particular ethnic group, a high proportion eligible for free school meals (FSM) or that they are all girls.

CVA scores take into account the important contextual factors that affect progress, so that all pupils' progress may be compared fairly and the school's contribution isolated. However, they cannot take into account factors for

which no data are collected, such as the occupation of parents or carers. We know that there is variation in the progress made nationally by different groups of pupils. The CVA model for any year examines the relative progress made by certain groups of pupils assessed in that year and derives a coefficient for each characteristic, such as female or eligible for free school meals (FSM). The largest group, such as White British for ethnicity, is chosen as the control group and given a coefficient of zero. For other groups, the coefficient can be positive or negative, and can be interpreted as the difference in that year between the progress made nationally by the group and the control group.

Look at Tables 21 and 22 in the *Reference booklet*. They show the 2004 coefficients for each group in the KS1-2 and KS2-4 models respectively. They are listed in rank order, so the group with the characteristic at the top of the list made the most progress nationally and the group with the characteristic at the bottom made the least progress nationally in 2004. In schools you inspect, you will need to check whether pupils with characteristics in these lists are making sufficient progress. The CVA graphs in the PANDA report can help with ethnic groups, gender, SEN and FSM but not with pupils in care, although it is hoped that this information will be available for the 2005 results. Section 6 of this module focuses on evaluating the progress of groups.

It is important to remember that the list of coefficients does not presuppose any hierarchy or acceptance of differential progress. It simply reflects the national progress data from 2004 on which the school-level CVA analyses in the 2004 PANDA report are based. It does not indicate the standards attained by any group. It should be used sensitively and with great care. The size of the coefficient does not indicate the relative importance of the characteristic in the national model as it does not take account of the proportion of pupils who have that characteristic. Prior attainment is by far the most important factor overall.

Familiarise yourself with Tables 21 and 22 in the *Reference booklet*.

Note:
- the characteristics that have high coefficients, and which of these are consistent across both key stages
- that the following characteristics have the lowest coefficients at both key stages (they describe *characteristics* and not pupils):
  - SEN
  - income deprivation linked to postcode
  - Traveller, Gypsy and Roma
  - joined school after September Y6 or Y10
- other characteristics with substantial low coefficients include:
  - FSM
  - in care while at this school
  - unclassified ethnic group (which comprises pupils for whom the school has not obtained ethnicity data and those who preferred not to say)

- that females made more progress than males at KS2-4, but less at KS1-2
- that pupils speaking EAL made strong progress at KS2-4 and above average progress at KS1-2
- the larger values of the coefficients in the secondary model, where there is wider variation in the progress of different groups.

You may wish to read further information about the coefficients in section 4.1 of the *Reference booklet*.

Examples of positive coefficient

The EAL group has a positive coefficient for both primary and secondary CVA, showing that it made more progress than the White British group in 2004. For KS2-4, the EAL group has a coefficient of 25, which is high. The model will only produce a positive CVA score for the EAL group in a school if it makes better progress than the national EAL group, all other factors being identical.

In a school with a very large EAL group, you may gather first hand inspection evidence of all pupils making progress that is above the overall national average. The CVA score for the school may not be above average, and appear to contradict your evidence. This could arise because the pupils made only the same very good progress as the EAL group nationally; the school's impact on progress had not led to it being greater than average for such pupils nationally.

If a school has a high proportion of pupils from groups that make above average progress nationally, for example it is a girls' secondary school, this characteristic alone would contribute to the progress made by pupils in the school. The inspection judgement is of the contribution of the school, rather than the pupils, to their progress. Your evaluation of the progress made by pupils **in this school** will depend upon the extent of progress its pupils make above the national average for girls, all other factors being equal. The CVA model takes this into account so the school's CVA score is a robust reflection of the impact of the school on progress. For a girls' school with CVA 1000 this means that you may observe progress that is above the national average, but not above the average for girls nationally. For schools with a combination of characteristics with high coefficients such as girls, Bangladeshi and EAL, this effect will be more marked.

Example of negative coefficient

One strong negative coefficient is for pupils who joined the school during Year 6 (for KS1-2), or during Year 10 or later (for KS2-4). In a school where a high proportion of pupils joined recently, you may observe that they have made comparatively little progress since the initial key stage, but the CVA score may be significantly above average. This could arise, all other things

being equal, because they have made greater progress between key stages than this group nationally; you will need to consider the extent to which the pupils' current school contributed to this.

If the CVA score does not initially accord with the progress you observe in a school, you should check the coefficients for any large groups in the school. This should help you to interpret and explore any apparent discrepancies.

Part 3   **20 minutes**

Judging exceptional differences in progress from the CVA graph

A difference may be statistically different from the national average but this may be by such a small margin that it does not represent an exceptional difference in educational terms.

A **rough** guide for identifying **progress** from Key Stage 1-2 that is exceptional in educational terms is:
  • progress of one level above or below the national expected progress by at least **one quarter** of pupils.

This is when at least one quarter of pupils make one level of progress more than expected or less than expected. The expected progress for each pupil is calculated using national averages based on contextual value added data. For an individual subject this is one level above or below the national expected progress; for overall core APS it is an average of one level in each of the three subjects above or below the national expected progress.

A **rough** guide for identifying **progress** from Key Stage 2-4 that is exceptional in educational terms is:
  • progress of one grade above or below the national expected progress by at least **one half** of pupils.

This is when at least one half of pupils make one grade of progress more than expected or less than expected. The expected progress for each pupil is calculated using national averages based on contextual value added data. For an individual subject this is one grade above or below the national expected progress; for capped total points score it is an average of one grade in each of the eight subjects above or below the national expected progress.

You need to convert the proportions in the rough guide into national curriculum points scores to evaluate a school's progress. To help you with this, Tables 7 and 12 in the *Reference booklet* show conversions from points to differences in levels and GCSE grades for proportions of pupils. Table 24 in the *Reference booklet* includes the following summary of equivalences as an aide memoir for use on inspection.

Rough guide to exceptionally high or low performance at each key stage

	Proportion of pupils gaining one level different*	Points score difference for an individual subject	Difference in overall core APS at KS1 to 3 or capped total score at KS4
KS1-2 **progress**	1/4	1.5	1.5
KS2-4 **progress**	1/2	3	24

* difference from national expected progress; you can also use this guide to judge the educational importance of other differences, such as year-on-year or between groups or subjects.

The average capped total points score is the total for the best 8 subjects. It is explained in *Information sheet 2: explanation of KS4 scoring system* in the *Interpreting data* CD-ROM.

The rough guide indicates that, if a school's KS2-4 progress were 24 points below average, its progress would be exceptionally low. It would represent half of the pupils making one level less progress in all eight of their GCSE subjects than expected.

When you are deciding whether a difference in points score represents exceptional progress, you cannot do this directly from the CVA score because it is not expressed in points. In the CVA calculation, the points above or below expected points for each pupil are worked out, taking into account all relevant contextual factors. Then the average for the school is found. When this value is used to calculate the school's CVA score, it is multiplied by a **shrinkage** factor which depends upon the size of the school's cohort. So, for all schools, the CVA score shows a smaller difference from average than would the school's average points equivalent.

For large schools the shrinkage factor is over 0.9 and has little effect; it has most effect on small cohorts.

For relatively small cohorts or groups, you will need to take the shrinkage factor into account when the points it represents appear to indicate exceptionally high or low progress, in order to check whether they do.

You may wish to read section 4.2 of the *Reference booklet* for a fuller explanation of shrinkage.

Example

For a primary cohort of 4 pupils and a secondary cohort of 15 pupils the shrinkage factor is roughly 0.5. If such a school had a CVA score of 101.5, which is 1.5 above average, it would represent 3 points above average. This is because the 3 points have been multiplied by a shrinkage factor of 0.5 to give the CVA score of 1.5 above average.

To help you take account of the shrinkage factor, Table 23 in the *Reference booklet* shows the approximate shrinkage factor for different cohort sizes. It

also shows the multiplier you can use to convert the CVA score difference from average to the points difference from average. For example, for the small school above with CVA score 101.5, the multiplier is roughly 2, which shows that the points difference from average is roughly 3 points (1.5 x 2).

Familiarise yourself with Table 23 in the *Reference booklet*.

Note the multiplier for:
- typical primary and secondary cohort sizes
- large and small cohorts
- all but the tiniest cohorts or groups is less than 2.

Before reading the commentary below, **decide** on the educational importance of a KS2-4 CVA score of 980 (1000 is the national average) for a school with a cohort of 35 pupils.

To do this:
- **check** Table 23 in the *Reference booklet* for the multiplier for a cohort of 35
- **bear in mind** the rough guide that a difference of at least 24 points at KS4 may be considered to be exceptional.

The school's CVA score is 20 below the average of 1000. The cohort is relatively small for secondary schools so will have a relatively large multiplier. Table 23 in the *Reference booklet* shows that the multiplier for a cohort of 35 pupils is 1.39 (roughly 1.4). Using 1.4 gives a school difference from average of roughly 28 points (20 x 1.4). It is educationally exceptional as it is over 24 points and would indicate a grade 4 for progress.

It is worth remembering that:
- multipliers are less than 2 for all but very tiny groups or cohorts. Consequently KS1-2 CVA scores less than 0.75 away from average and KS2-4 scores less than 12 away from average are unlikely to be educationally exceptional. KS1-2 CVA scores between 0.75 and 1.5, and KS2-4 scores between 12 and 24, may be educationally exceptional in small schools, because they have relatively large multipliers.

Look in the *Reference booklet* at Graph 1, KS1-2 CVA national distribution.

You can use it to estimate whether the progress made by schools at the 10th and 90th percentile is exceptional. In fact, only schools at these percentiles with small cohorts, and multipliers larger than roughly 1.2, would have a large enough points difference from average (1.5) to have exceptional progress. Larger schools near to these percentiles will not have exceptional progress. The CVA scores of almost all of the schools with exceptional progress therefore lie on the steep parts of the curve outside the 10th and 90th percentiles.

Evaluating overall progress for a key stage

You should form your first impression of progress in the school from looking at the overall CVA graph. However, the extent of variation across groups, key stages, and subjects, including any underachievement, is paramount in informing your judgement on how well pupils make progress.

This part of the task focuses on forming a first impression of progress, using the information from parts 1-3 above.

Look at the graph below for School 28. It has a high proportion of pupils eligible for free school meals and who live in postcode areas with high income deprivation scores. Inspectors observe progress that is below the national average.

Before reading the commentary below, **form** a preliminary judgement of overall KS2-4 progress and explain any apparent discrepancies between the observed evidence and the CVA score. **Look** at the notes for judging standards and progress in section 5 of the *Reference booklet* to help you with this.

School 28 and national KS2-4 overall CVA distribution
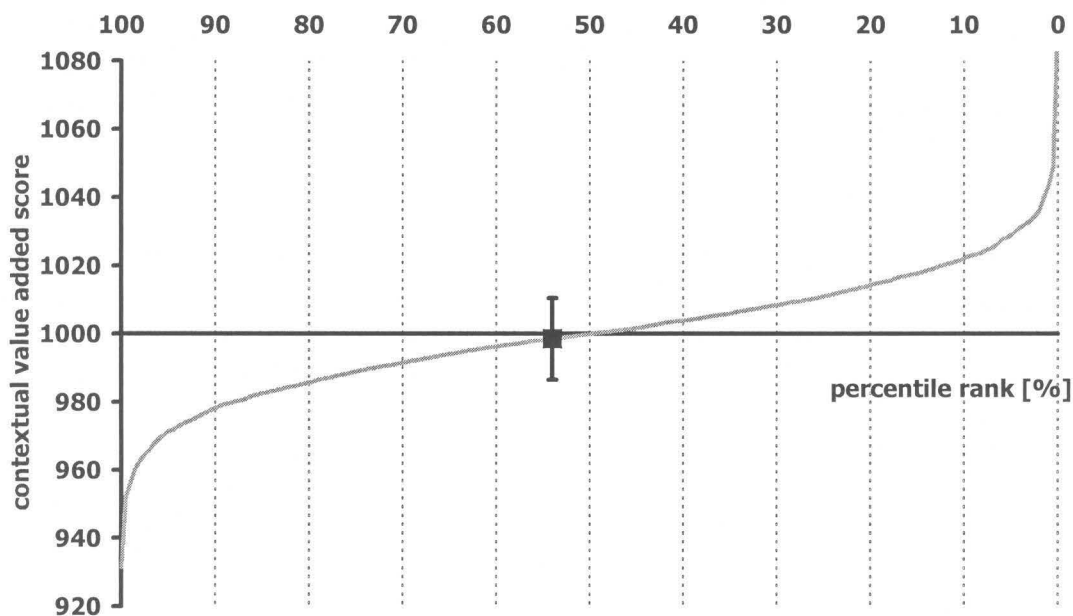
School 28's overall CVA score is very close to average and not significantly different from it. Many pupils in the school have the characteristics of groups that made below average progress nationally, as seen from the negative coefficients in Table 22 in the *Reference booklet*. All other factors being equal, the CVA score shows that pupils in the school have made the same progress as these groups nationally. So the school has enabled expected progress to be made, but not added more value than this. A preliminary

judgement of KS2-4 overall progress is that it is satisfactory, even though observed progress is below the national average for all pupils.

School 28's CVA score places it near the 54th percentile. You can see that School 28 has a relatively wide confidence interval, so the actual progress contributed by the school may vary widely from the results of this specific sample of pupils. We are 95% confident that it lies between the CVA score shown by the bottom and the top of the bar, in other words between roughly 985 and 1010, a range of 25. However, you cannot use these scores to read directly from the graph School 28's minimum and maximum possible percentile rank because the graph does not take account of the confidence intervals of the other schools. There are statistical methods that can calculate these ranks, but you can estimate them from the graph using **two thirds** of the school's confidence interval. For School 28, two thirds of the confidence interval would give CVA scores between roughly 989 and 1006; using these you can estimate from the graph that the school's rank falls roughly between the 40th and 70th percentile.

For a school with a small cohort, the confidence interval will be large and consequently the minimum and maximum percentile rank within which we are 95% confident that the progress contributed by the school actually lies will be further apart.

You can see from the shape of the national distribution that the slope is small and fairly similar between the 10th and 90th percentiles so that even schools with small confidence intervals that lie in this part of the graph would have a range of possible ranks. In contrast, many schools in the top and bottom 10 percent of the graph, which slopes steeply, even those with relatively wide confidence intervals, would have their maximum and minimum possible ranks still within this highest or lowest 10 percent of schools. This is a key factor that distinguishes them as exceptional and likely to graded 1 or 4 for progress.

Look at the overall CVA graphs for Schools 29-32 in the appendix. Their cohort sizes are respectively: 15, 27, 72 and 87.

For each school, **make a preliminary judgement** of overall progress across the key stages shown.

Take into account:
- the educational importance of the CVA
- whether the CVA score is significantly different from average
- the percentile rank of the school's CVA score
- the effect of cohort size on educational importance, significance and rank.

To do this, **consult** the following parts of the *Reference booklet* where appropriate for the specific school:

- the notes for judging standards and progress in section 5, including the rough guide and the data indicators
- the multipliers in Table 23, for any school in which the extent of progress may be exceptional but is not clearly so (bearing in mind that multipliers are less than 2 for all but very tiny cohorts)
- the size of confidence intervals in Table 23, to inform your judgement about whether a school has non-significant CVA merely because its cohort is very small, and to use two thirds of it to estimate the school's minimum and maximum possible ranks if these might affect its progress grade
- Table 17, of the percentage of schools for which CVA is significant (this is roughly 25% sig+ and 25% sig-).

You may find it helpful to **check** the commentary for School 29 in the appendix before making your judgements for the other schools.

Part 5   **15 minutes**

Evaluating CVA in relation to attainment – the 'quadrant' graph

Look at the graphs of school CVA in relation to attainment over the last two years for School 33, a primary school. They link CVA with **final attainment**, not prior attainment. This type of graph is referred to as a 'quadrant' graph, as each of the four quadrants represents a different situation. For primary schools, attainment is shown in terms of overall APS at Key Stage 2. These graphs are the only display that shows the confidence interval for the school's overall attainment at its final key stage; this depends on **both the cohort size and how much the standards vary** within the school.

Graphs of KS1-2 CVA score and KS2 attainment

School 33 in 2003
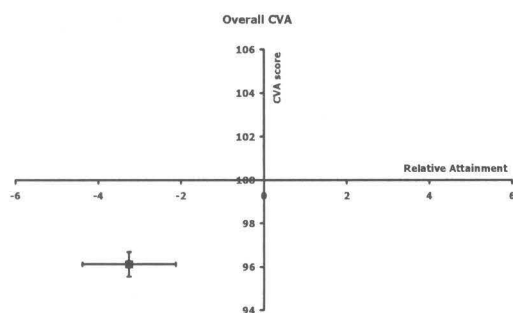
School 33 in 2004
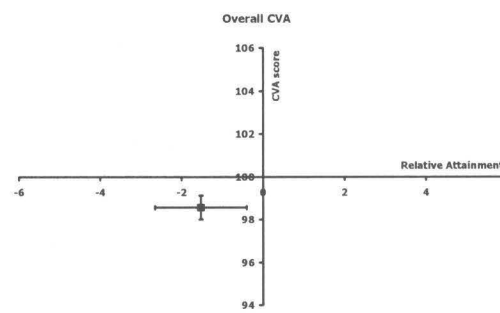
Nationally, schools with similar final attainment have a range of different CVA. In general, schools with lower final attainment have lower CVA.

Schools in the top of the graph have above average CVA scores, while the pupils in the schools in the bottom half of the graph are adding less value

than average. In the bottom left quadrant this has led to below average attainment; schools in the bottom right quadrant have higher than average attaining pupils but are adding below average value. Schools causing concern will lie at the extremities of one of the bottom quadrants.

School 33 had particularly low standards and CVA score in 2003, so is plotted towards the bottom left of its quadrant. By 2004 its CVA score has improved, resulting in higher standards; both have increased by roughly two units although they are still significantly below average. This big improvement in CVA score represents over two national curriculum points or all pupils making one more level of progress in relation to expectation in one subject, as shown in Table 7b in the *Reference booklet*. It contributes strong positive evidence towards the judgements on school effectiveness and leadership and management. Before considering the performance of groups or in subjects, the preliminary grades supported by this graph are 3 for attainment and progress.

The quadrant graph does not enable you to work out where the school falls in the national distribution, and the attainment scale shown in these examples does not accommodate all schools. Consequently, you should use the quadrant graph only for a rapid visual check of the school's performance; the overall KS1-2 CVA graph gives you the degree of detail you need to make judgements on progress.

In 2004, the national mean attainment was just over Level 4 at KS2 and roughly midway between grades C and D at KS4. It is given the value 0 on the relative attainment axis. From the scales on the axes, you can quickly see roughly how many points away from the mean attainment the school lies. The KS4 attainment axis in these examples uses the old scoring system. It shows average capped total points score. Table 15b in the *Reference booklet* show the equivalence between points and levels or grades for interpreting the attainment, and Table 12b shows the data for interpreting the CVA.
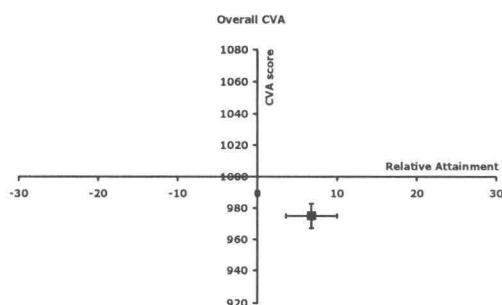
Look at the quadrant graphs for School 34

Graphs of KS2-4 CVA score and KS4 attainment

School 34 in 2003
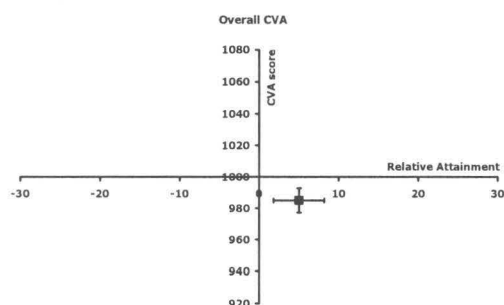
School 34 in 2004

Before reading the commentary below, **decide** how you would describe the attainment, progress and improvement since the previous year in School 34.

School 34 has significantly above average attainment at Key Stage 4 which has improved since 2003. It is now slightly less than 8 points above average, so attainment is not educationally exceptional. The CVA score is significantly below average and has fallen, even though attainment has risen.

This is possible because the 2004 cohort had higher attainment on entry than the 2003 cohort, but the school has not added value as well for these pupils as it did for the previous cohort. Perhaps it did not enable the higher attainers to make the progress they were capable of; you would be able to determine this from the information on groups and individuals in the PANDA report, which is dealt with in the next section of this module.

If you were inspecting this school, the attainment on entry graphs would show whether the 2004 cohort was unusual or attainment on entry had remained higher or continued to rise. Inspection should determine how effectively the provision meets the needs of any changing intake.

The school's low CVA score may convert to a points score near to the rough guide indicator for exceptional performance of 24 points. However, from a quick visual check, the preliminary grades that this graph supports are 2 for standards reached by pupils and 3 for progress. Nevertheless, the performance of groups and in subjects, and closer check on the overall CVA score, may prove otherwise.

Look at the quadrant graph of overall CVA score and attainment for Schools 35 and 36 in the appendix.

For each school:
- **describe** its attainment and CVA score
- **judge** the extent of improvement since the previous year
- **evaluate** its progress, taking account of its attainment.

To do this, **consider**:
- the educational importance of the CVA score and attainment
- statistical significance, whether its confidence intervals cross any axes
- whether any improvement has been sufficient.

Then **check** the commentary in the appendix.

**Part 6**   **20 minutes**

Evaluating subject progress

The whole school CVA graph may show that the CVA score is not significantly different from average. This might suggest a grade 2 or 3 for overall progress. However, there may be variation between subject CVA scores, which you can see from the subject graphs. The data indicator chart for graded judgements on standards and progress, Table 25 in the *Reference booklet*, shows that if subject variation were large and included substantially below average performance, progress could not be graded 2.

School subject CVA is shown on a quadrant graph, on which final attainment is also plotted. Unlike overall key stage quadrant graphs, subject graphs are provided only for the most recent year.

Look at the subject graphs for School 37. It had 49 pupils in the cohort.

School 37 KS1-2 CVA and KS2 subject attainment
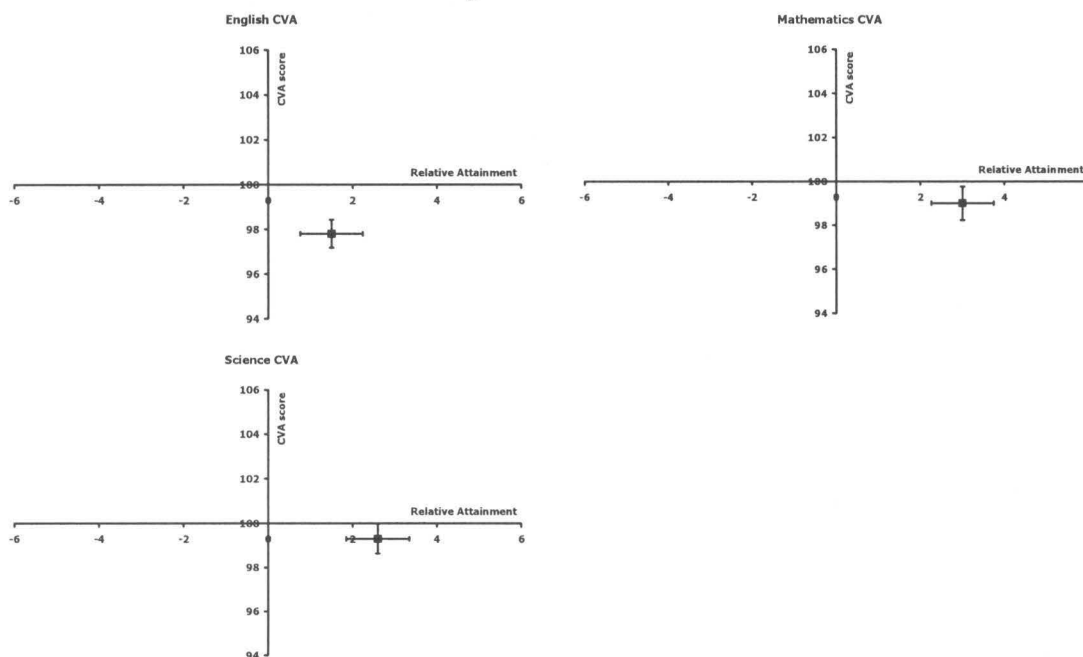
Before reading the commentary below, **note** that one subject is performing less well than the others.
Decide whether:
  • the lower progress in this subject is exceptional (grade 4 indicator)
  • the variation in CVA score between subjects is large and includes substantially below average performance (below grade 2 indicator).
Then **judge** School 37's overall progress.
To help you, **consult** the rough guide (Table 24) and data indicators (Table 25) in the *Reference booklet*.

To evaluate the educational importance of the very low English CVA score, which is more than 2 below average, you can just glance at the confidence interval because the whole of it lies more than 1.5 below average. Checking in the rough guide gives 1.5 points as an indicator of exceptional KS1-2 progress, so School 37's CVA score in English represents exceptionally below average progress. The school's results are definitely more than 1.5 points below average as, after applying the shrinkage factor which brings the score nearer to the average than were the points, the CVA score (and even its whole confidence interval) is still more than 1.5 away from average.

From the quadrant graph you cannot gauge where the school's English CVA score falls within the national distribution. For a rough idea about this, **look** at Graph 1 in the *Reference booklet*, the national distribution graph for KS1-2 overall CVA. It is similar to the graphs for KS1-2 subject CVA.

School 37 has a particularly low CVA score in English, at just below 98. This places School 37 within the bottom five percent of the national distribution. Because this is the steeply sloping part of the curve, if the school's actual CVA score were at the top of its confidence interval, which is narrow, it would still lie near the bottom of the national distribution, within the lowest ten percent of schools. In addition, the CVA score is significantly below average.

In the other subjects the CVA score is also significantly below average but far nearer to it, and the standards are consequently higher. There is large variation between subjects that includes substantially below average performance, but all progress is significantly below average which indicates no higher than grade 3 for overall progress. However, the CVA score for English is exceptionally low and triggers the overall judgement that progress is inadequate.

School 37 is an example of a school with above average attainment in which pupils are making inadequate progress.

Look at the KS2-4 subject CVA graphs for School 38 in the appendix.

Look also at the national distribution graphs for English and mathematics CVA, Graphs 3 and 4 in the *Reference booklet*. **Note** how these differ from the overall distribution graphs in scales and values because they are based on a single subject rather than eight.

Note that the CVA scale uses the current scoring system and the attainment scale uses the old scoring system.

Look also at Table 12a (for CVA) and Table 15a (for attainment) in the *Reference booklet* that show the equivalence between points differences for single subjects and differences in grades for proportions of pupils.

Evaluate the progress in each subject. **Decide** whether it is exceptional.

Then **check** the commentary on this task in the appendix.

Look at the subject CVA graphs in the anonymous primary PANDA report and the subject CVA tables two pages before them.

Make a preliminary judgement of the progress in each core subject and overall. **Comment** on relative strengths and weaknesses, and whether differences were sufficiently substantial to affect the overall progress judgement.

To do this:
- **use** the notes for judging standards and progress at the back of the *Reference booklet*
- **bear in mind** how different the school's CVA ranking for each subject is
- **look** at the overall CVA graph for 2004 and **note** how the subject progress has influenced the overall progress.

Then **check** the commentary on this task in the appendix.

Review

Can you now:

- recognise that the CVA score is a measure of progress that is attributable to the school
- use the school's CVA 'snake' graph as the most important graph in the PANDA report
- evaluate whole-school progress
- evaluate progress in subjects and differences in progress between subjects
- interpret the educational importance and statistical significance of a school's contextual value added (CVA) score
- evaluate a school's CVA in relation to its attainment?

Section 6   Progress of groups and individuals

Time   **50 minutes**

Key objectives

- To know where to find information on standards and progress of groups and individuals, and who is omitted
- To identify underachievement in ethnic and gender groups
- To evaluate progress of different attainment groups
- To recognise whether pupils adding the most and least value make very different progress from the majority
- To select any individuals or groups to follow up on inspection.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report
Reference booklet

Section detail

This section focuses on the progress of groups and individuals. When judging progress and achievement in a school, the data for both the whole school and groups must be taken into account.

The relevant extracts from the evaluation schedule and guidance are given in Section 5 of this module.

The majority of the information on groups in the PANDA report shows their progress, but the school improvement summary report also includes the attainment APS for some groups.

Inclusion

There is helpful information on absence and disapplication from assessment at Key Stages 1 to 3 in the cumulative distribution graphs for thresholds in the PANDA report. The GCSE subject tables also show the entry as a percentage of the cohort, which it is useful to check for the core subjects.

There is information in the school improvement summary and CVA graphs for groups on the standards and progress of pupils with statements and who have special needs but not statements.

Data on the standards and progress of the lowest attainers is provided in different places. The cumulative distribution graphs show the percentage of pupils who achieve the level below the lowest in the table. The school

improvement summary shows conversion rates for pupils with low prior attainment. It also shows attainment and CVA for pupils whose attainment on entry was below the nationally expected level, and the CVA graphs for groups also show the latter. The low attainers may also be seen easily on the scatter plot showing individual pupils' progress. The graph of the percentage of 'no passes', the '% fail' column in the GCSE subject tables and the bar charts showing the numbers of GCSE courses taken per pupil provide information on access and achievement at Key Stage 4.

The CVA graphs include only those pupils for whom results at the previous key stage are in the national database, regardless of where they went to school. Consequently, they omit pupils who were abroad, not in maintained schools, absent or disapplied at the initial key stage. A group of recent refugees would therefore not be included in the CVA calculation. For KS2-4 CVA, pupils who arrived from abroad after Year 6 will be omitted. The percentage coverage is stated on the graphs; for KS2-4 CVA it gives the percentage of pupils with Key Stage 4 results for whom there are also Key Stage 2 results. Coverage is not a measure of stability.

The attainment on entry graphs also show the percentage coverage for each year group. For the relevant year groups (Years 11, 9 and 6) this may differ slightly from the CVA coverage as it is based on pupils on roll when the school completed its return rather than on those who took the national assessment. Pupils are omitted from the attainment on entry graphs if they do not have assessment results for the previous key stage; you should check which groups they belong to and how the school monitors their progress.

You should note the proportion of pupils omitted from CVA calculations and find out what groups they belong to and how the school has monitored their progress. They may have made substantially more or less progress than the pupils included in the CVA score; the SEF may provide information on this. Their progress will contribute to the overall judgements on progress and achievement.

One group of pupils who are included in the CVA calculations is those for whom there are results at the previous key stage for only one or two subjects.

In the CVA graph for ethnic groups, the 'unclassified' group is for pupils from two categories: 'parent/pupil preferred not to say', and 'information not obtained'. If this category contains a large number of pupils, it affects the school's ability to monitor performance by ethnic group and meet the requirements of the Race Relations (Amendment) Act. If there are pupils for whom ethnic information has not been obtained, this reflects on leadership and management. Important information on the progress of groups is lost when pupils from a range of ethnic groups are combined to form a large unclassified group.

There are three types of graph showing the CVA scores of groups and individuals. One shows these for large groups, another shows them for the 19 ethnic groups in the census and another shows the progress of each pupil.

You may find a ruler helpful in reading these graphs. In the PANDA report, the CVA scores and the size of the 95% confidence interval are given in a table below the group CVA graphs.

Part 1: Comparing the CVA of groups   15 minutes

The PANDA report contains the graph below which shows the CVA scores of relatively large groups in the school. The sizes of the groups enable some of them to have significant CVA scores, more so in large secondary schools than in small primary schools. The CVA model essentially compares groups in a school with like pupils nationally, so the CVA score for each group takes into account its characteristics and gives a fair basis for isolating the impact of the school's input.

The graph for KS2-4 CVA for School 39 below shows some groups with sig+ CVA scores and none with sig- scores or CVA below 1000. Although the school's overall CVA is significantly above average, with both girls and boys having significant positive CVA, this graph still identifies relative strengths and weaknesses.

KS2-4 CVA for groups in School 39
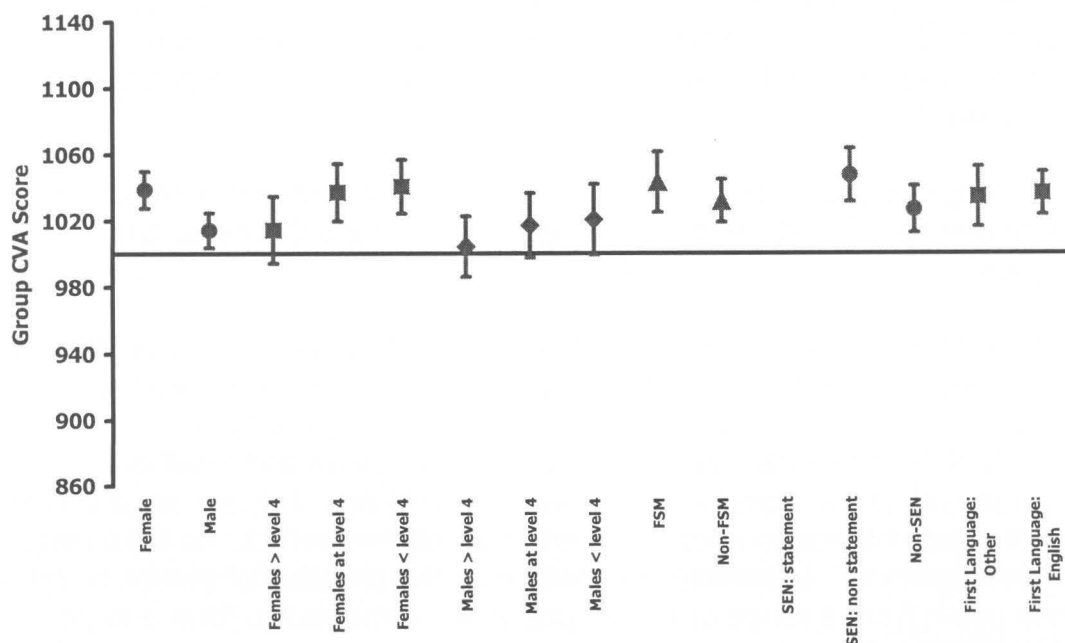
Before you read the commentary below, **identify** some of the strengths and weaknesses in the progress of groups in School 39 and issues to follow up on inspection.

Girls make more progress than boys, and have a CVA score roughly 40 above average, which is exceptional. In each attainment group, girls also perform better than boys, although overall the highest prior attainers have the lowest CVA scores, perhaps due to ceiling effects. Further strengths are the progress of pupils with SEN and those eligible for free school meals, but the school has no pupils with statements as there is no bar for this group. Key points to follow up are how the girls do so well and why boys and higher attainers are making much less progress than them.

Table 23 in the *Reference booklet* shows the size of confidence interval for different group sizes. For KS2-4 groups under five the confidence interval is over 30. In School 39, the largest interval looks to be about 25, representing about 15 pupils. The confidence interval is the distance that the bar protrudes on *one* side of the plotted CVA score.

Look at the graph for School 40 below.

The school's overall CVA is not significantly different from average, but the graph for groups shows some important variations.

Before reading the commentary below, **decide** whether any groups in School 40 are underachieving and **identify** the strengths and weaknesses in the progress of groups.

KS2-4 CVA for groups in School 40
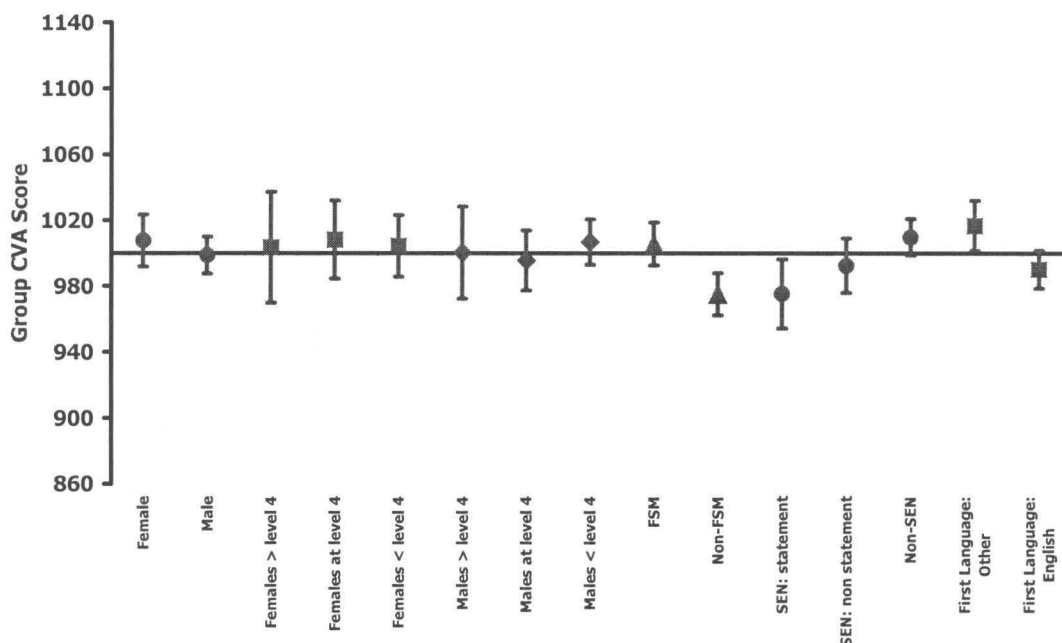
Pupils with statements and those not eligible for free school meals are underachieving because their CVA score is significantly below average. The scores appear to be not quite as far below average as 24. This may not be exceptional when converted to points for the non-FSM group as it is large. However, the wide confidence interval (approximately 25) shows that the group with statements is relatively small (about 15). Table 23 shows that the multiplier for a group this size is 1.9, so this means that the CVA score of roughly 20 below average represents roughly 20 x 1.9 points, or 38 points. As this is markedly more than 24 points, it is an exceptional difference from average. Consequently there is considerable underachievement by pupils with statements. This group contains a substantial number of pupils, so the overall judgement on progress for the school is that it is inadequate.

In School 40, pupils whose first language is English also have a negative CVA score, but not significantly so, while those with another first language appear to make significantly above average progress. The SEF should identify if literacy or attitudinal factors contribute to this difference. Girls make more progress in relation to girls nationally than boys do in relation to boys nationally, even though there are fewer of them, as shown by the larger confidence interval.

Part 2: Ethnic groups   10 minutes

The PANDA report contains a graph of the CVA score for each of 19 ethnic groups. The small size of these groups in many schools means that there are few instances of statistically significant CVA scores. Tables 20a and 20b in the *Reference booklet* show the percentage of schools containing ethnic groups in which progress for the group in the school significantly exceeded the progress observed for this group nationally. There are separate tables for primary and secondary schools. For White British pupils the proportion of significant CVA scores is close to the overall national percentages. Other groups rarely, if ever, have significant CVA scores, so you are only likely to come across them on a small proportion of your inspections.

Even though few groups will have statistically significant scores, you should look at the graph for indications of trend, such as a few negative CVA scores. You should check the table beneath the graph in the PANDA report for the number of pupils in each ethnic group, then check the CVA score for each of the relatively large groups in the school. You should follow up any very low CVA scores for any group of one or two pupils, but these alone would not be sufficient cause for judging progress to be inadequate. However, if a substantial group, or a significant number of individuals, has an exceptionally below average CVA score, progress should be judged inadequate.

Look at the graph for School 41 below.

Before reading the commentary below:

- **form** an impression of the school's overall CVA
- **pick out** the larger ethnic groups in the school
- **identify** inclusion issues to follow up.

KS2-4 CVA for ethnic groups in School 41
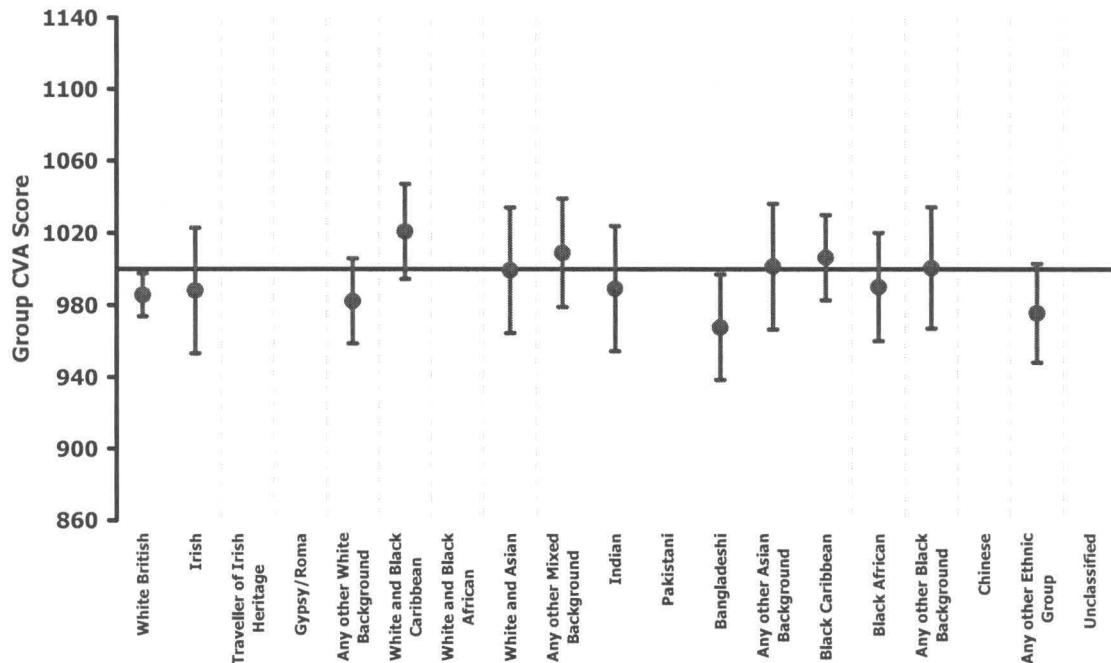
Although progress is below average in this school, the graph is helpful in identifying some groups with significantly below average CVA scores.

The White British group has the smallest confidence interval and therefore is the largest group in the school. Its CVA score is significantly below average but not to an exceptional degree.

Other relatively large ethnic groups are 'any other White background' and 'Black Caribbean'. The former have CVA below average and the latter slightly above average.

Bangladeshi pupils have a significant negative CVA score that is more than 30 below the average of 1000 and therefore exceptional. Table 23 in the *Reference booklet* indicates that the confidence interval size of roughly 30 (shown by the length of the bar on *one* side of the score) reflects a group size of about 5. The progress of these pupils is an issue to follow up on inspection, about which you would expect to find information in the SEF.

## Part 3: Attainment groups and individuals   25 minutes

The graphs in the previous two sections show the CVA score for pre-selected groups of pupils. But progress may be exceptionally high or low for a group

not included in these analyses, such as a teaching group, or for individual pupils. The PANDA report for 2005 includes a scatter plot based on each pupil's contextual added value to help you identify any pockets of high or low progress, and to pick out any pupils you may wish to follow up on inspection. It will not be included in the 2004 PANDA but the examples in this section are based on 2004 results.

On the graph below for School 42, the horizontal axis (x) shows the points score that the CVA model would expect the pupils to obtain, having taken account of contextual factors and the national progress made by the 2004 Key Stage 4 cohort. The vertical axis (y) shows the actual national curriculum points the pupil obtained at Key Stage 4. These both use the current scoring system. The national expectation line, shown in solid grey, passes through the points where y = x, such as (0,0), (50,50) and (100,100). If every pupil in the school attained precisely their expected points score, their result would lie on this line.

Expected versus actual KS4 attainment in School 42
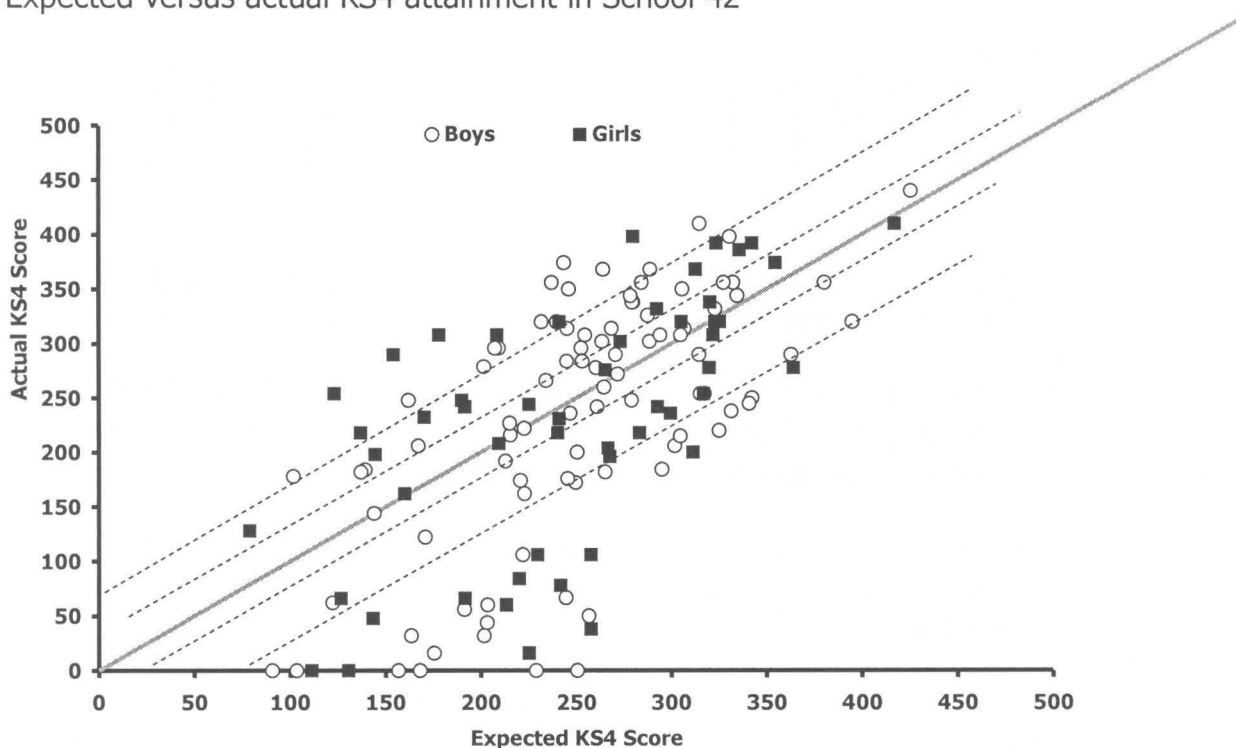
The dashed lines show respectively the national percentiles at 10%, 25%, 75% and 90%. So pupils plotted above the top dotted line are adding very high value, in the top 10% of contextual added value nationally. Pupils below the bottom dotted line are adding very low value, in the bottom 10% of contextual added value nationally. For a school in which all of the points fall between the 25th and 75th percentile dotted lines, the contextual added value would be close to national expectation and consistent.

The scatter plot shows boys and girls with different symbols. You can also identify whether higher, lower or middle attainers made expected progress.

It is easy to see whether there is large variation in pupils' added value, which would raise inclusion issues if some pupils' results fell below the 25th percentile line. In a school in which the vast majority of pupils added high value but a group added less than the expected value, you may judge progress to be only satisfactory unless there is a convincing explanation of such disparity within the school. Such a group of pupils may not show up in any other analyses if their common characteristic is teaching group or course.

The graph is particularly useful in schools for which the overall CVA is not significantly below average.

A school may query why the total of each pupil's added value shown on this graph does not give the school's CVA score. It is because of the shrinkage factor applied when calculating the school's score, which is given in Table 23 in the *Reference booklet*.

Look at the scatter plot for School 42.

Before reading the commentary below:
- **draw** a loop around the points representing pupils who have underachieved substantially
- **describe** any characteristics they have in common
- **decide** whether there is a large variation in pupils' progress in relation to expectation.

The points furthest below the national expectation line are for pupils with expected points scores of 100 to 250. Table 11a in the *Reference booklet* shows that this is equivalent to an average of grade D (34 x 8 = 272) or below in all eight GCSE subjects. Almost 30 pupils in this group gained an actual score of 100 points or less. This is a large number of low attainers who have fallen a long way below their expected points score, generally by over 100 points. According to Table 12b in the *Reference booklet*, this represents making progress of two grades fewer than expected in all eight subjects. Eight of the pupils had a zero score so were probably absent, and others have such low scores that they may have taken few examinations. The underachievement of this large group of pupils would trigger the judgement that progress in the school was inadequate.

There is large variation in pupils' progress in relation to expectation from the underachievement of some of the low attainers to the substantial number adding more than 100 points above expectation, including some lower attainers.

The table below shows the number of points away from the national expectation line that each percentile dotted line lies. This can help you to estimate the educational importance of each pupil's contextual added value.

Points distance from national expectation of each percentile line

Percentile line	10%	25%	75%	90%
KS1-2 points difference from national expectation	-3.1	-1.5	1.5	2.8
KS2-4 points difference from national expectation	-82	-29	42	73

A **rough** guide for identifying an **individual pupil's progress** from Key Stage 2-4 that is exceptional in educational terms is:

- progress of at least **two grades** above or below the national expected progress in each of the eight subjects.

From Table 12b in the *Reference booklet*, you can see this is equivalent to 96 points. On the scatter plot, this value would fall just outside the 10% and 90% lines. As the KS2-4 graph axes are numbered from zero, you can see where the lines for 96 points from national expectation would lie by holding a ruler parallel to the dotted lines and passing through 96 (roughly 100) on one of the axes.

In School 42, a few pupils lie far enough above the 90th percentile line to be in the region representing more than 96 points above national expectation. However, over 20 pupils lie far enough below the 10% line to be in the region representing greater than 96 points below the national expectation, mainly pupils who are expected to gain 250 points or fewer.

A **rough** guide for identifying **an individual pupil's progress** from Key Stage 1-2 that is exceptional in educational terms is:

- progress of at least **one level** above or below the national expected progress in all three subjects.

From Table 7b in the *Reference booklet*, you can see this is equivalent to six points. On a scatter plot, this would be roughly twice as far away from the national expected line as are the 10% and 90% lines. You can hold a ruler on the KS1-2 scatter plot, parallel to the dotted lines, to estimate where these lines would lie.

For Key Stage 4 attainment, you may also find it useful to draw lines at the equivalent on each axis of eight grades C, which Table 11a in the *Reference booklet* shows is equivalent to 8 x 40 = 320 points, five grades C (200 points), eight grades G (128 points) or five grades G (80 points), depending upon the school. This can help you to describe the lower, middle and higher attainers within the school. For Key Stage 2 attainment you may find it helpful to draw lines at the points scores for Levels 3 and 4 in all three subjects. Table 3 in the *Reference booklet* shows that these are 21 and 27 points respectively.

Look at the scatter plots for:
- Schools 43 and 44 in the appendix
- the primary and secondary anonymous PANDA reports (shown also in *Appendix 2: answers to the tasks*).

Note the groups for which progress is above average and those for which it is below average, and those for which it is exceptionally high or low.

Draw a loop around any pupils for whom there is substantial underachievement, and **describe** any characteristics they have in common.

Use the following extract from the evaluation schedule for achievement and standards to **decide** whether achievement is inadequate in the school: "Considerable numbers of pupils underachieve, or particular groups of pupils underachieve significantly."

To do this, **consider** whether:
- there is wide variation with substantial numbers of pupils who make below average progress (if they form no obvious group they may represent a KS2 teaching group or KS4 course group)
- boys and girls are equally distributed or one is generally substantially below the other (you may find it helpful to slide a ruler away from the national expectation line, keeping parallel to it, to see if the pupils below it are predominantly boys or girls)
- individuals below the national expectation line are similar in attainment or are predominantly of one gender
- there are individuals whose progress is exceptionally low (on inspection this may pinpoint one or two pupils to follow up, and cross checking with the negative CVA bars in the ethnicity graph may identify their ethnicity).

Then **check** the commentary in the appendix.

Review

Can you now:

- find information on standards and progress of groups and individuals, and who is omitted
- identify underachievement in ethnic and gender groups
- evaluate progress of different attainment groups
- recognise whether pupils adding the most and least value make very different progress from the majority
- select any individuals or groups to follow up on inspection?

Section 7   Overall judgements

Time   **45 minutes**

Key objectives

- To follow an efficient order for consulting the graphs and ask yourself key questions while doing so
- To form preliminary overall judgements on standards, progress and achievement
- To identify issues to pursue on inspection.

Resources required

Anonymous primary PANDA report
Anonymous secondary PANDA report
Reference booklet

Section detail

This section brings together information and skills from all the previous sections and builds on some of the preliminary judgements you have made for the two schools in the anonymous PANDA reports.

TASK

Look at the primary and secondary anonymous PANDA reports.

The three judgements on achievement and standards for you to make are:
- The standards reached by learners
- How well learners make progress, taking account of any significant variations between groups of learners
- How well do learners achieve?

For each school **form** your preliminary judgements on standards, progress and achievement, and **identify** issues to pursue on inspection.

To do this:
- **consult** the notes on judging standards and progress at the back of the *Reference booklet*
- **refer** to the grade descriptions for achievement and standards at the beginning of section 5
- **look through** the list of key questions and prompts below.

After doing this for the first school, **check** the commentary in the appendix.

Key questions and prompts

Progress

1   What % of pupils is omitted from the CVA calculation and attainment on entry information?
2   Secondary schools: give most weight to KS2-4;
      then check KS2-3 and KS3-4; any similarities?
3   Is overall CVA exceptional?
4   Is overall CVA on the steep part of the national graph?
5   Is overall CVA sig+, sig- or neither?
6   Is variation large and including substantially below average performance?
7   Any evidence of improvement in progress?
8   Are subject CVA scores exceptional or sig + or - and by how much? Any similarities?
9   How might the characteristics of any large groups of pupils affect CVA
      – is expected progress below or above national average?
      – implications for observed progress?
10   Is there a large group of pupils with unclassified ethnicity? Does this mask the progress of any ethnic group?
11   Is any ethnic group's CVA score exceptional or sig + or - and by how much? How do the larger ethnic groups progress?
12   Any underachieving ethnic groups or individuals to follow up?
13   Any group, such as gender, SEN or attainment, with CVA score exceptional or sig+/-?
14   Any underachieving individuals to follow up – with detail of gender and attainment?
15   Preliminary judgement on progress
16   Issues to follow up

Standards

1   Check the lower KS then the higher KS – are there similarities?
2   A/D numbers and GCSE % entry
      % 'no passes', % fail, number of GCSE courses - any inclusion issues?
3   Are current standards exceptional?
4   Are standards on the steep part of the national graph?
5   Are current standards sig + or -?
6   Trends: up, down, and compared to national, consistent?
      Any evidence of improvement in standards since last inspection?
7   Any large differences across core subjects?
8   Core subjects: percentages at level thresholds sig + or -,
                        bunching at threshold, reaching top levels/grades
9   Preliminary judgement on standards
10   Issues to follow up: inclusion, recent rise/fall, standards, thresholds,
                        high levels, KS or subject differences?

Review

Can you now:

- follow an efficient order for consulting the graphs and ask yourself key questions while doing so
- form preliminary overall judgements on standards, progress and achievement
- identify issues to pursue on inspection?

The end of the module

Thank you for completing it.

We hope that you now feel more confident and efficient in using the PANDA report to inform your judgements and to identify issues to follow up on inspection.

If you have any queries about this module, or wish to explore any of the issues it raises in using data for inspection, please email gill.close@ofsted.gov.uk.

Data module: training materials for interpreting the PANDA report

The training materials will help schools interpret the new-style PANDA report for use in inspections from September 2005.

It contains a training module designed for school inspectors. This provides guidance on evaluating:
- attainment on entry
- standards, trends and targets
- progress in the whole school
- progress of groups and individuals

and on making overall judgements.

It includes a reference booklet for use throughout the module and for inspectors to refer to during school inspections.

The module is intended for individual distance learning, and is suitable for a full-day tutored course. Individual sections may also be used alone for guidance on interpreting a particular kind of graph. The module builds on the Interpreting data training materials published in Spring 2005. There is a link to these earlier materials at the end of this introduction.

Ofsted believes it is important to inform schools about what inspectors have been offered as training. The module may also be helpful when a school interprets data as part of its self-evaluation.

To work through the module, you will need to refer to all six of the following documents. You may find it easier to use printouts than to work on screen. The files are Word and pdf documents. Save a file to your PC by right-clicking its link.

The links to each part of the module are under the heading *'Related publications'* on the RIGHT HAND SIDE of this page:
http://www.ofsted.gov.uk/publications/index.cfm?fuseaction=pubs.summary&id=3968

Data module: training materials for interpreting the PANDA report
Reference booklet: for use in the data module and school inspections
Appendix 1: graphs for the tasks in the data module
Appendix 2: answers to the tasks in the data module
Anonymous primary PANDA report: used for tasks in the data module
Anonymous secondary PANDA report: used for tasks in the data module

Link to the Spring 2005 Interpreting data materials which include useful preparation for this data module:
http://www.ofsted.gov.uk/schools/interpretingdata.cfm.