Introduction
The Cognitive Abilities Test (CAT) is published by nferNelson. The third edition (CAT3) was published in June 2001. The complete series of tests, from levels A to H, cover the age range 7 years 6 months to 17 years. Level D is the level taken by most Y7 students. Levels G & H which take the test to Y11-Y13 were published in September 2003. Roughly 70% of all secondary schools use CAT to assess their pupils on entry to Y7, and approximately 25% also test in Y9. Many primary schools also use CAT, predominantly in Y4. Approximately one-third of LEAs use CAT strategically across all their schools. Three-quarters of customers, and nearly all secondary schools, use the computer-scoring service provided by nferNelson.

What does CAT measure?
CAT is actually nine tests grouped into three batteries which assess a pupil's ability to reason with and manipulate the three different types of symbols that play a substantial role in human thinking:
- verbal – thinking with words
- quantitative – thinking with numbers
- non-verbal – thinking with shape and space.

CAT scores indicate general transferable abilities, such as the ability to recognise similarities, analogies, patterns and relationships, all fundamental to understanding and assimilating new information. They are designed specifically to minimise the role of prior learning and can therefore provide an indication of potential. They differ from the national tests (or SATs) which indicate attainment in some core areas of the curriculum and reflect how well pupils have acquired and retained specific knowledge in these areas.

Uses of CAT scores
The CAT tests are used for monitoring trends in the abilities of the intake, identifying individual pupil’s cognitive strengths and weaknesses, identifying SEN, the more able/gifted and underachieving pupils or groups, informing target setting and assessing value added. These uses are described further below.

How are scores reported?
For easy comparison, pupils’ raw scores are converted to standard age scores (SAS), stanines and percentiles. Figure 1 shows the link between these different scores.

- **Standard ages scores (SAS)** have a mean of 100 and a standard deviation of 15, which shows how widely spread the data are around the mean of 100. Around two-thirds of pupils in the national age group will score between 85 and 115 (up to one standard deviation away from the mean on each side), 95% score between 70 and 130 (up to two standard deviations from the mean) and 99% score between 60 and 140. The upper and lower quartiles of the distribution are an SAS of 90 or below (bottom 26%) and 111 or above (top 26%) respectively.
• **Stanines**, short for ‘standard nines’, are nine summary score bands ranging from 1 (lowest) to 9 (highest). The table below shows the percentage of pupils expected in each stanine if the school has a national average intake.

• **National percentile rank (NPR)** shows the percentage of pupils nationally who obtain a SAS at or below a particular score. An NPR of 50 represents the 50th percentile, which is the median for the age group.

![Figure 1: Normal curve of distribution showing standard age scores, national percentile ranks and stanines.](image)

<table>
<thead>
<tr>
<th>Description</th>
<th>Stanine</th>
<th>Percentage of pupils</th>
<th>Corresponding percentile (NPR)</th>
<th>Corresponding standard age score (SAS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>9</td>
<td>4</td>
<td>97+</td>
<td>127+</td>
</tr>
<tr>
<td>Above average</td>
<td>8</td>
<td>7</td>
<td>90-96</td>
<td>119-126</td>
</tr>
<tr>
<td>Above average</td>
<td>7</td>
<td>12</td>
<td>78-89</td>
<td>112-118</td>
</tr>
<tr>
<td>Average</td>
<td>6</td>
<td>17</td>
<td>59-77</td>
<td>104-111</td>
</tr>
<tr>
<td>Average</td>
<td>5</td>
<td>20</td>
<td>41-58</td>
<td>97-103</td>
</tr>
<tr>
<td>Average</td>
<td>4</td>
<td>17</td>
<td>23-40</td>
<td>89-96</td>
</tr>
<tr>
<td>Below average</td>
<td>3</td>
<td>12</td>
<td>12-22</td>
<td>82-88</td>
</tr>
<tr>
<td>Below average</td>
<td>2</td>
<td>7</td>
<td>5-11</td>
<td>74-81</td>
</tr>
<tr>
<td>Very low</td>
<td>1</td>
<td>4</td>
<td>4-</td>
<td>73-</td>
</tr>
</tbody>
</table>

**What do the reports from the scoring service look like?**
The figure overleaf shows a report from the computer scoring service which contrasts the scores for a group of pupils against the national average. Schools typical received one of these reports for each form group as well as an overall report for the whole intake.
The profile of reasoning scores for the group against the national average

**CAT overview**

**CAT 3**

**Group Distribution of Standardised Scores**

**School:** Sample School  
**Class/Group:** Y7/ALL  
**No. of Pupils:** 52  
**CAT Level:** D  
**Date of Test:** 15/Aug/2002

**Mean score:** The graph to the bottom right shows the mean scores for the group on each battery, together with the confidence intervals around the means. Where the confidence interval does not overlap the national 100 line, then the mean score is significantly different from the national average. In the above example, all three scores are significantly lower than the national average.

**Distribution of scores:** The mean score does not tell us about the distribution of the scores or the range of ability represented in the intake. This information is given in the three bar charts which plot the percentage of pupils in each stanine for the school (bar) versus the national average (dot) for each CAT battery.

If the school does not have the above report, you can make a rough judgement as to whether the mean SAS is significantly different from the national average by consulting the table given in Appendix 1. Alternatively, for groups consisting of 100 or more pupils, you can consult the benchmark table below.

**CAT benchmarks for mean scores (Level D) based on groups of at least 100 pupils.**

<table>
<thead>
<tr>
<th>CAT Battery</th>
<th>CAT 5</th>
<th>CAT 25</th>
<th>CAT 40</th>
<th>CAT 50</th>
<th>CAT 60</th>
<th>CAT 75</th>
<th>CAT 95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>88.5</td>
<td>94.9</td>
<td>97.4</td>
<td>99.0</td>
<td>100.6</td>
<td>102.7</td>
<td>112.1</td>
</tr>
<tr>
<td>Quantitative</td>
<td>90.9</td>
<td>95.5</td>
<td>97.2</td>
<td>98.4</td>
<td>99.7</td>
<td>101.6</td>
<td>111.2</td>
</tr>
<tr>
<td>Non-Verbal</td>
<td>91.4</td>
<td>96.1</td>
<td>98.2</td>
<td>99.5</td>
<td>100.7</td>
<td>102.6</td>
<td>109.5</td>
</tr>
<tr>
<td>Mean CAT</td>
<td>90.6</td>
<td>95.5</td>
<td>97.6</td>
<td>98.9</td>
<td>100.2</td>
<td>102.2</td>
<td>111.1</td>
</tr>
</tbody>
</table>
Individual Pupil Profiles

Some schools rely only on the mean CAT score as an overall indicator of a pupil’s reasoning ability, but best practice involves considering the separate test scores. The Individual Pupil Profile (see example below) summarises the pupil’s scores on the three batteries. It may also show national test or examination indicated outcomes where the school has requested these (the example below shows GCSE indicators).

Best practice in schools involves using the CAT to identify the strengths and weaknesses of individual pupils. For example some pupils may be strong in reasoning with numbers or visual symbols, but weak in reasoning verbally (the above example shows such a “V-” profile). Others may show a distinct strength in reasoning with one symbol system which can be used to scaffold their relative weakness in the other two areas. Examples of different pupil profiles, and guidance on their implications for teaching and learning, are given in Chapter 3 of “Getting the Best from the CAT” (2003).

A profile for a group of pupils can also be completed by plotting the pupils’ NVR scores against their VR scores to construct a group visual-verbal learning profile. The website provides a downloadable EXCEL spreadsheet for this purpose (http://www.nfer-nelson.co.uk/cat/Research.asp).

Pupils with English as an Additional Language (EAL)
Verbal reasoning scores may underestimate the reasoning abilities of pupils with little knowledge of the English language or with poor reading skills. The Non-Verbal battery,
which requires no knowledge of English language or the number system, is particularly useful in these cases.

**Gifted and talented pupils**

Many schools use CAT as part of their strategy for identifying gifted and talented pupils. A focus on reasoning abilities can identify pupils who may not be found through an analysis of purely curriculum related attainments. CAT also provides a measure of a pupil’s abilities against a national sample, not just in relation to his or her peers within the school. Scores of 126 or above on any one battery, or 120 or above on any two batteries, identify the top 5% of pupils nationally. CAT is the test most frequently used as evidence of a pupil’s eligibility for membership of the National Academy for Gifted & Talented Youth (NAGTY).

**Value added analyses**

Indicators for KS2, KS3, GCSE and AS/A2, and progress bar charts, can be found on the CAT website: [www.nfer-nelson.co.uk/cat](http://www.nfer-nelson.co.uk/cat). These indicators are based on tracking the progress of large and nationally representative samples of pupils, and are updated each year to keep pace with national trends.

A summary of the progress charts in 24 GCSE subjects for an individual pupil can be produced on one sheet of A4 by entering the pupil’s CAT3 scores in the attached EXCEL file ([www.nfer-nelson.co.uk/indicators/cat3gcsepupilprofile.xls](http://www.nfer-nelson.co.uk/indicators/cat3gcsepupilprofile.xls)).

There are also Excel workbooks which enable schools to analyse value added at each key stage. An example for GCSE\GNVQ is given in the attached link ([www.nfer-nelson.co.uk/cat/2004/2004cat3gcse/gcsequartiles.xls](http://www.nfer-nelson.co.uk/cat/2004/2004cat3gcse/gcsequartiles.xls)).

These workbooks, the overall summary table for each key stage and progress bar charts for English, mathematics and science at each key stage are included in this CD.

Some schools will have test results only for the second edition (CAT2). The website provides separate tables and workbooks for CAT2 and CAT3 scores, and information on how to convert CAT2 scores into their CAT3 equivalents.

**Rough rules of thumb for headlines figures**

The computer scoring service provides a group summary report showing the indicated GCSE\GNVQ points scores (capped and uncapped) and the proportion of the cohort who may be expected to achieve 5+ A*-C grades and 5+ A*-G grades respectively (see below).
It is important to check when the report was produced. If the report was produced in Y7/Y9, then the estimates will need to be recalculated for the pupils in Y11 to reflect (i) the fact that some pupils may have left the school and other joined the school in the intervening years, and (ii) the national increase in GCSE results.

This can be done by looking up the 5+A*-C/5+A*-G probabilities for each pupil in the Y11 group using the most recent GCSE summary table (http://www.nfer-nelson.co.uk/indicators/cat_3.asp#cat2_gcse) and averaging the probabilities for all the pupils in the cohort to calculate the group mean. The figure overleaf also shows the probabilities of a pupil achieving 5+A*-A and 5+A*-C in relation to their mean CAT3 score. Alternatively the pupils CAT3 scores and GCSE\GNVQ points scores can be added into the relevant CAT value-added workbook to compare actual versus expected attainment (www.nfer-nelson.co.uk/cat/2004/2004cat3gcse/gcsequartiles.xls).

As a rough rule of thumb, the proportion of the cohort with mean CAT3 scores at or above certain cut-points can give an approximate indicator of the possible outcomes. For GCSE\GNVQ these cut-points are:

- Mean CAT3 score of  **85** to achieve 5+A*-G grades (including English and maths)
- Mean CAT3 score of  **99** to achieve 5+A*-C grades
- Mean CAT3 score of  **120** to achieve 5+A*-A grades
The proportion of the cohort meeting or exceeding these mean CAT3 score cut-points roughly equates to the proportion who may achieve each level of GCSE success. For example, if 53% of the cohort have a mean CAT3 score of 99 or above, then 53% might be expected to achieve 5+A*-C grades. Equally if approximately 10% of the cohort have a mean CAT3 score of 120 or above, then 10% might be expected to achieve 5+A*-A grades.

Probability of achieving 5+A*-C and 5+A*-A GCSE grades or equivalent in relation to mean CAT3 score - autumn 2004

Where can I go for further information?

The CAT User Support website contains:

- Answer to frequently asked questions
- School case studies
- Technical reports on the indicators
- Value-added EXCEL workbooks
- Examples of the scoring service reports
- Research and resources
- Details of training courses and dates.

See www.nfer-nelson.co.uk/cat.

Dr Steve Strand
Senior Assessment Consultant
nferNelson
7th February 2005
Files contained on the CD

CAT3 - KS2 Indicators summary table_Autumn 2004 (pdf)
CAT3 - KS3 Indicators summary table_Autumn 2004 (pdf)
CAT3 - GCSE Indicators summary table_Autumn 2004 (pdf)
CAT3 - AS Indicators summary table_Autumn 2004 (pdf)

CAT3- KS2  English, maths and science Progress Charts (pdf)
CAT3- KS3  English, maths and science Progress Charts (pdf)
CAT3-GCSE English, maths and science Progress Charts (pdf)

CAT3-KS3 Quartile Chart (xls)
CAT3-GCSE Quartile Chart (xls)
CAT3-GCSE pupil profile of 24 GCSE Indicators (xls)
CAT3 Visual-Verbal Learning Profile (xls)
CAT2 to CAT3 conversion sheet (xls)