CAT4

Individual student report for teachers
Irish Edition
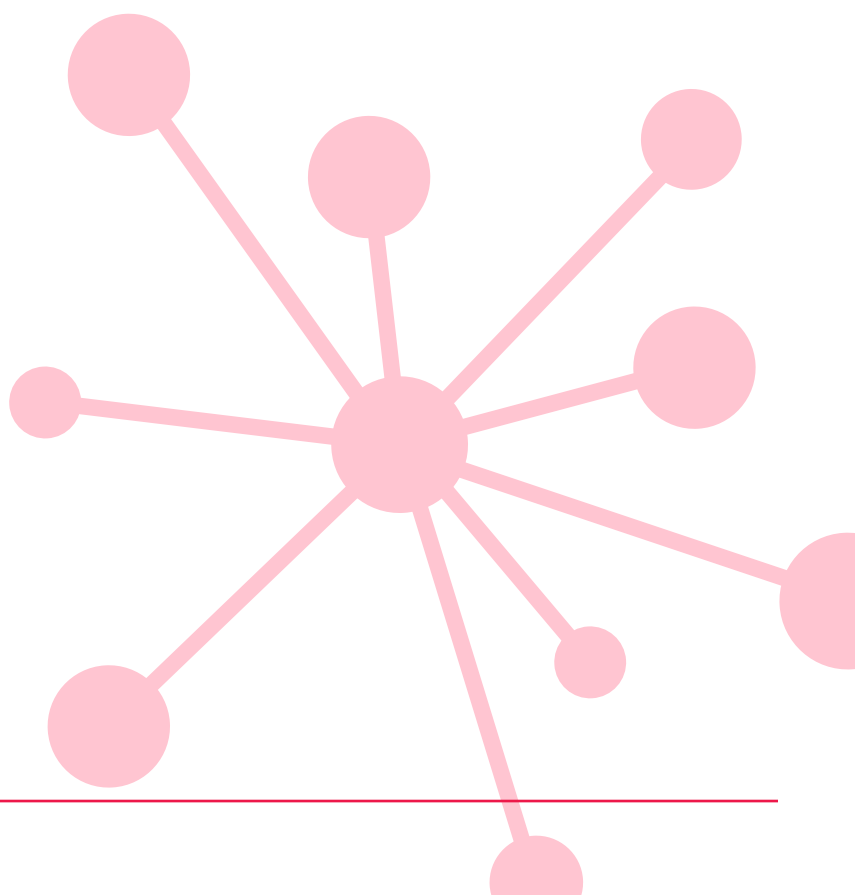
Individual student report for teachers

School: Sample ROI school		
Date of test: 27/03/2019	Level: G	No. of students: 30

What is *CAT4*?

The *Cognitive Abilities Test (CAT)* is a suite of tests that assesses a student's reasoning (thinking) abilities in key areas that support educational development and academic attainment. *CAT4* is the fourth edition of the test and comprises the following sections or batteries which assess different aspects of ability:

Verbal Reasoning Battery – thinking with words

Verbal Classification

Three words are presented which are similar in some way or ways. From a selection of five possible answers, the student must identify a fourth word with similar properties. The answer is snow because rain, fog and sunshine are all types of weather and snow is also a type of weather.	rain fog sunshine winter	snow	weather	dark	night

Verbal Analogies

A pair of connected words is presented alongside a single word. From a selection of five possible answers, the student must select a word to complete the second pair in the same way. The answer is window, because a carpet goes on a floor and a curtain hangs at a window.	carpet → floor : curtain → window | shade | hang | drapes | cloth

Quantitative (or Numerical) Reasoning Battery – thinking with numbers

Number Analogies

Two pairs of related numbers are presented. From a selection of five possible answers, the student must select a number to complete a third pair. The answer is 8. Here 1 add 1 makes 2, but that doesn't work for the second pair because 5 add 1 is 6, not 10. Instead, you have to multiply by 2 to get the second part of each pair, so 4 times 2 is 8.	[1 → 2] [5 → 10] [4 → ?] 5 | 7 | 8 | 9 | 10

Number Series

A sequence of numbers created by a transformation rule is presented. From a selection of five possible answers, the student must identify the rule and continue the sequence. The answer is 15. There are two number patterns in this series. The first, third and fifth numbers go down by 1 at a time – 18, 17 then 16. The numbers in between them go up by two at a time – 5, 7 then 9. This means the next number must be 16 minus 1, giving 15.	18 5 17 7 16 9 → 11 | 12 | 13 | 14 | 15

Non-verbal Reasoning Battery – thinking with shapes

Figure Classification

Three designs are presented which are similar in some way or ways. From a selection of five possible answers, the student must identify a fourth design with similar properties.

The answer is E because it is the only answer choice that is a striped semi-circle, like the first three figures.
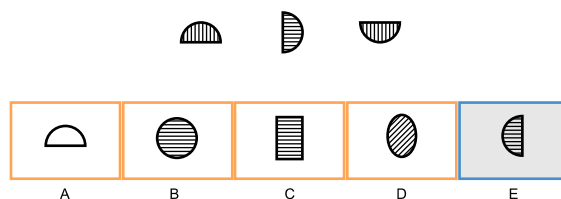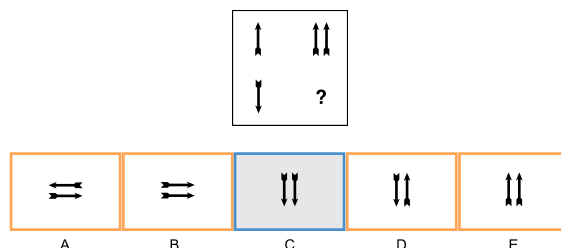
Figure Matrices

Designs are presented in a grid with one empty square and, from a selection of five possible answers, the student must identify the missing design.

The answer is C because in the top pair 'one arrow up' goes to 'two arrows up', so in the second pair 'one arrow down' must go to 'two arrows down'.

Spatial Ability Battery – thinking with shape and space

Figure Analysis

A series of diagrams shows a square being folded repeatedly, and then punched through with holes. From a selection of five possible answers, the student must identify how the paper will appear when unfolded.

The answer is D. The hole is punched through both layers of paper, so as it is unfolded the holes will be a mirror image of each other, with the crease being the mirror line.
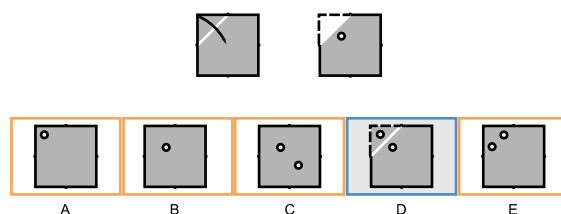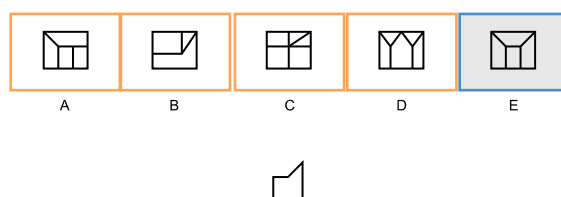
Figure Recognition

Several complex designs are presented along with a single target shape. From a selection of five possible answers, the student must identify the target shape within one of the complex designs.

The answer is E. It isn't A because that shows the target flipped over. It isn't B or C because they have shapes that are the wrong size.

Why use *CAT4*?

CAT4 is a comprehensive and objective test of a student's developed abilities – those that, in part, determine attainment and can be built upon and developed to improve outcomes. For example, verbal reasoning can be developed by supporting a student's reading, comprehension and vocabulary.

CAT4 has many uses, but the main focus of each individual report is to inform teachers, students and their parents and carers about an individual's underlying ability and how this can be recognised and built upon to ensure that a student achieves his or her potential.

CAT4 provides a benchmark and may be used very effectively as part of a review of a student's performance alongside other information including teacher assessment and school management data on aspects such as attendance, additional needs, EAL status, etc.

CAT4 provides indicators of attainment for Leaving Certificate grades which provide a starting point for target setting. Targets that challenge students can be set based on *CAT4* results and other data, which should be considered alongside the profile of a student's ability from *CAT4*. Consideration of both ability (*CAT4*) and attainment and other factors (such as attendance) all play an important part in target setting and progress monitoring.

Relationship between *CAT4* scores

Description	Very Low	Below Average		Average			Above Average		Very High
Stanine (ST)	1	2	3	4	5	6	7	8	9
Standard Age Score (SAS)	70	80	90	100	110	120	130		
National Percentile Rank (NPR)	1 5 10 20	30 40 50 60 70	80 90 95	99					

Example results

In *CAT4* **battery** is the title given to each of the four pairs of tests which assess different aspects of ability.

The **Verbal Reasoning Battery** comprises two short tests: Verbal Classification and Verbal Analogies.

The **Quantitative Reasoning Battery** comprises two short tests: Numbers Analogies and Number Series.

The **Non-verbal Reasoning Battery** comprises two short tests: Figure Classification and Figure Matrices.

The **Spatial Ability Battery** comprises two short tests: Figure Analysis and Figure Recognition.

The **number of questions attempted** can be important: a student may have worked very slowly but accurately and not finished the test and this will impact on his or her results.

The **Standard Age Score (SAS)** is the most important piece of information derived from *CAT4*. The SAS is based on the student's raw score which has been adjusted for age and placed on a scale that makes a comparison with a nationally representative sample of students of the same age across Ireland. The average score is 100. The SAS is key to benchmarking and tracking progress and is the fairest way to compare the performance of different students within a year group or across year groups.

Performance on a test like *CAT4* can be influenced by a number of factors and the **confidence band** is an indication of the range within which a student's score lies. The narrower the band the more reliable the score. This means that 90% confidence bands are a very high level estimate. The dot represents the student's SAS and the horizontal line represents the confidence band. The yellow shaded area shows the average score range.

Battery	No. of questions attempted	SAS	NPR	ST	GR (/60)	SAS (with 90% confidence bands) 60 70 80 90 100 110 120 130 140
Verbal	48/48	**95**	37	4	=39	
Quantitative	24/36	**101**	52	5	=24	
Non-verbal	48/48	**115**	84	7	=5	
Spatial	36/36	**116**	86	7	8	
Mean	-	**107**	-	-	-	

The scores for each of the four batteries are averaged to give the **mean** score.

The **National Percentile Rank (NPR)** relates to the SAS and indicates the percentage of students obtaining any particular score. NPR of 50 is average. NPR of 5 means that the student's score is within the lowest 5% of the national sample; NPR of 95 means that the student's score is within the highest 5% of the national sample.

The **Stanine (ST)** places the student's score on a scale of 1 (low) to 9 (high) and offers a broad overview of his or her performance.

The **Group Rank (GR)** shows how each student has performed in comparison to those in the defined group. The symbol = represents joint ranking with one or more other students.

Name: Moses Albright			
School: Sample ROI school			
Group: Transition Year			
Date of test: 27/03/2019	Level: G	Age: 16:01	Sex: Male

Scores

Battery	No. of questions attempted	SAS	NPR	ST	GR (/30)	SAS (with 90% confidence bands)								
						60	70	80	90	100	110	120	130	140
Verbal	48/48	**127**	96	9	1								⊢●⊣	
Quantitative	11/36	**90**	26	4	16			⊢●⊣						
Non-verbal	37/48	**111**	77	6	=3					⊢●⊣				
Spatial	28/36	**118**	89	7	1						⊢●⊣			
Mean	-	**112**	-	-	-						⊢●⊣			

Profile summary

The analysis of *CAT4* scores allows all students to be assigned a profile; that is they are assigned to one of seven broad descriptions of their preferences for learning. The Verbal Reasoning and Spatial Ability Batteries form the basis of this analysis and the profiles are expressed as a mild, moderate or extreme bias for verbal or spatial learning or, where no bias is discernable (that is, when scores on both batteries are similar), as an even profile.

The black diamond shows Moses' profile, which is indicated by the coloured band.
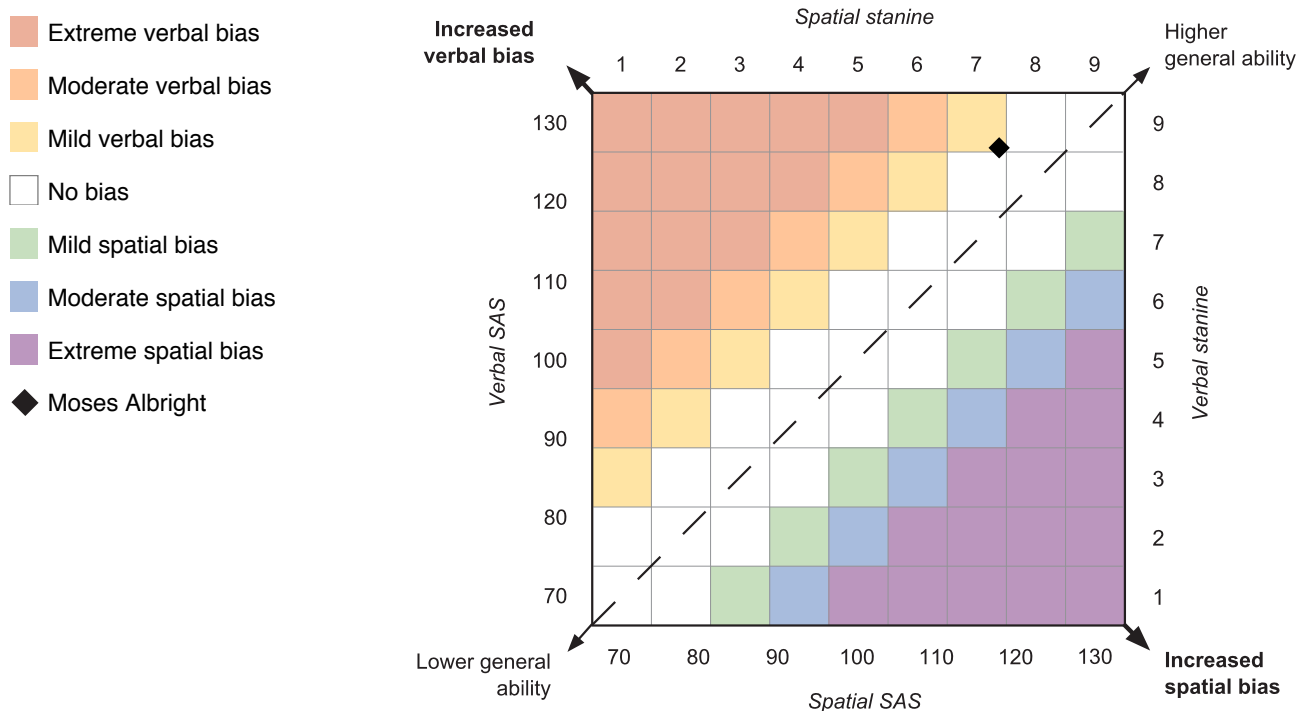
Name: Moses Albright			
School: Sample ROI school			
Group: Transition Year			
Date of test: 27/03/2019	**Level:** G	**Age:** 16:01	**Sex:** Male

Mild verbal bias

- This profile demonstrates a mild preference for verbal over spatial learning.

- However, as both verbal and spatial abilities are strong, Moses should perform at a high level when learning through writing, discussion, paired work and creative tasks, as well as working with pictures, diagrams, 3D objects, mind maps and other tangible methods of learning.

- Moses may show a preference for engaging with written material over active learning methods such as modelling, demonstrating and simulations, but his mild bias means he is likely to respond equally to a variety of teaching and learning methods.

- Moses' abilities suggest that he should be supported in independent learning.

- Moses' attainment in language-based subjects should be at the highest level and his performance in science, technology, design and geography which will draw on his spatial ability should also be strong.

Implications for teaching and learning

- Expectations need to be appropriately high with enrichment activities to provide challenge and extension.

- While teachers should continue to use a broad and varied range of styles, it is likely that Moses will be a self-motivated and independent learner.

- Teachers should encourage Moses to follow his own interests. He will benefit from a fast pace of instruction, tend to learn very quickly and will respond well to tasks that develop independent study skills.

- Extension activities that require Moses to form hypotheses, make predictions and test outcomes may be particularly helpful.

- Q&A sessions should be used to develop higher order verbal thinking skills by requiring Moses to justify opinions.

- Moses may benefit from opportunities to teach/coach others.

- Moses should be encouraged to read extensively and choose from a wide range of material.

- Moses may enjoy creative writing and discussion and debate and should be encouraged to develop such interests both in lessons and through extra-curricular activities.

Name: Moses Albright	
School: Sample ROI school	
Group: Transition Year	

Date of test: 27/03/2019	**Level:** G	**Age:** 16:01	**Sex:** Male

Leaving Certificate indicators

Results from *CAT4* can give an indication of the Leaving Certificate grades a student will reach. A second grade is suggested – this is the grade a student could reach with additional effort and challenge. This information is helpful when you discuss with your students the targets they should be working towards.

Mean SAS: 112	**Verbal SAS:** 127	**Quantitative SAS:** 90	**Non-verbal SAS:** 111	**Spatial SAS:** 118

	Probability of obtaining each grade								Most likely grade achieved	'If challenged' grade achieved	Probability of student obtaining grade H4 or higher / Probability of student obtaining grade H2 or higher
	O5 or lower	O4	O3	H6/O2	H5/O1	H4	H3	H2	H1			
Biology	0%	0%	1%	2%	4%	9%	18%	46%	20%	H2	H1	
Business	0%	0%	1%	2%	4%	10%	29%	35%	20%	H2	H1	
English	0%	0%	0%	1%	3%	9%	27%	38%	22%	H2	H1	
Geography	0%	0%	0%	1%	2%	6%	18%	46%	27%	H2	H1	
History	1%	0%	1%	3%	4%	11%	27%	37%	16%	H2	H1	
Home Economics	0%	0%	0%	1%	1%	5%	11%	47%	34%	H2	H1	
Art	0%	1%	1%	1%	4%	25%	43%	23%	2%	H3	H2	
Chemistry	4%	3%	5%	11%	9%	14%	16%	30%	9%	H3	H2	
Construction Studies	2%	1%	2%	2%	7%	19%	37%	28%	2%	H3	H2	
French	2%	2%	2%	3%	7%	14%	29%	30%	12%	H3	H2	
Irish	4%	5%	6%	5%	9%	16%	21%	29%	5%	H3	H2	
Physics	3%	5%	7%	16%	12%	16%	14%	20%	7%	H4	H3	
Maths	6%	7%	14%	20%	16%	15%	13%	8%	2%	H5/O1	H4	