



Using Competition and Assessment Reports

School reports are sent to each participating school. They contain detailed information about the performance of students at that school compared to participating students in their region.

This document uses the example of the school report of a fictitious school that has participated in the International Competitions and Assessments for Schools (ICAS) in Mathematics. The format of the school report is common to all subject areas. An explanation is provided for each section of the report.

The reporting format provides schools and teachers with enhanced and accessible diagnostic information about student strengths and weaknesses both at individual and cohort levels.

Some information provided in the report is only available to schools that have entered 85% or more of their students in any one year level. Their reports allow comparative data tracking between each cohort from Years 2 to 12. This type of information for consecutive years of school is not available from any other assessment program in Australia.

2012 Mathematics International Competitions and Assessments for Schools

ABC Public School

Reference to 'Region' in this report guide refers to the reporting region that a school has been assigned. A school's location determines a reporting region. A reporting region is required so the performance of a student can be appropriately compared to the results of all students in the same region.

Dear Principal

Thank you for taking part in the 2012 International Competitions and Assessments for Schools - Mathematics. This report provides your school's results. Details about each year level that participated can be found on subsequent pages.

Year 7

	School	Region
Participants	145	20991
Average Score	22.4	19.5

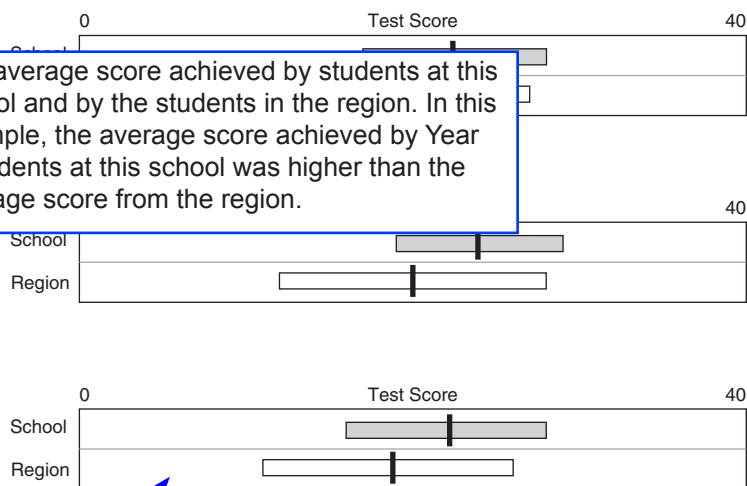
Year 8

	School	Region
Participants	137	22804
Average Score	23.9	20.0

Year 9

	School	Region
Participants	136	14407
Average Score	22.2	18.8

The average score achieved by students at this school and by the students in the region. In this example, the average score achieved by Year 9 students at this school was higher than the average score from the region.



This is a graphical representation of Year 9 students from the school in comparison with Year 9 students of the region. The shaded upper bar shows students from this school and the lower white bar shows students from the region.

The length of the bar represents the **range of scores achieved by 80% of students** with the top 10% and the bottom 10% of scores removed. The **vertical line** represents **the average score**.

The bottom 10% is removed because it may include scores of students who have made no serious attempt or who may suffer some serious disadvantage. The upper 10% will include students who are well in advance of their peers. If the highest and lowest achievers are included the resulting graph would stretch from 0% to 100% and would not provide any information about the bulk of students.

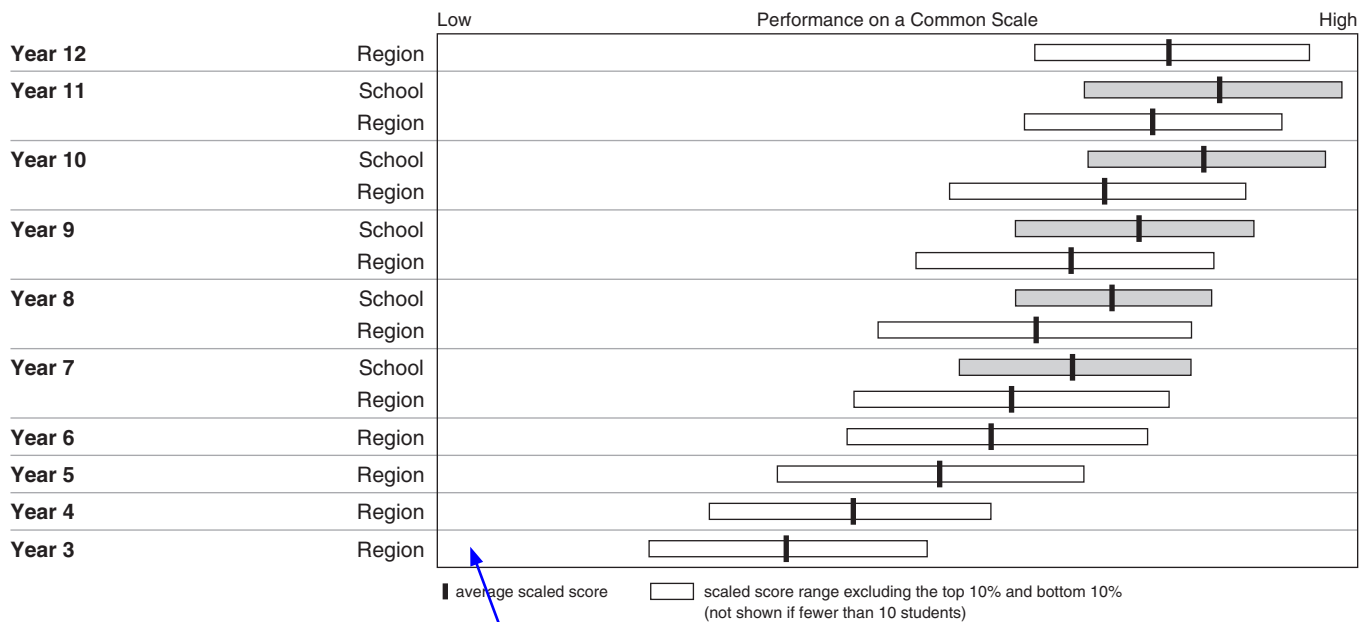
Students in your school received 15 High Distinction, 145 Distinction, 269 Credit and 209 Participation certificates in the 2012 International Competitions and Assessments for Schools - Mathematics.

AWARD OF CERTIFICATES

- High Distinction: top 1% of students in each year level in each region
- Distinction: the next 10% of students in each year level in each region
- Credit: the next 25% of students in each year level in each region
- Participation: all others.

2012 Mathematics - Year 3 to Year 12 - Results on a Common Scale

The graph below shows all year levels in the Region on a common scale.



In the subsequent sections of the report, section 2.7 shows the development of students over time, section 2.8 compares students of a given year

This section compares the performance of each cohort of students from Year 3 to Year 12 within this school (if available) and within the region. The length of the bar represents the range of scores achieved within each cohort by 80% of students with the top 10% and the bottom 10% of scores removed. The vertical line represents the average score for the cohort.

To allow this comparison to be made, the scores of all students are placed on a common scale using a statistical method known as **test equating**. This method requires the use of questions that are common to two or more examination papers, called **link items**. This allows a series of pair-wise comparisons to be made between cohorts to place each cohort on a common scale.

This graph shows that, as we would expect, the average score increases for each successive cohort. Thus the average score for Year 9 students in the region is higher than the average score for Year 8 students, and the average score for Year 10 students is higher than for Year 9, and so on.

NOTE

Comparative statistics may be misleading if only a small number of students participated in the Assessment. Some statistical procedures are unreliable if the population within a cohort is fewer than twenty so some types of reporting are not available to schools with low entry numbers.

Schools that have

- five or fewer entries in a Year level do not get any detailed statistics
- ten or fewer entries in a Year level do not get 80 per cent ranges (only the average is provided)
- twenty or fewer entries in a Year level do not get Strengths / Weaknesses provided.

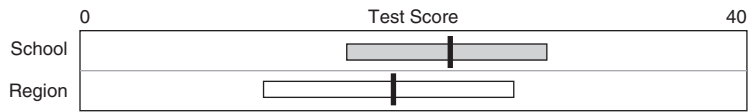
Section 2.1 Year 9

2012 Mathematics - Year 9 - Summary

The graph below shows the performance of your Year 9 students

This section compares your students' performances in each of the skill areas assessed with the performance of all students who participated. Year 9 Mathematics assesses skills in 5 areas: Number & Arithmetic, Algebra & Patterns, Measures & Units, Space & Geometry and Chance & Data. These skill areas are different for each subject.

	School	Region
Number Of Questions	40	40
Participants	136	14407
Average Score	22.2	18.8
Standard Deviation	4.4	5.6
Highest Score	31	39



The standard deviation is a measure of the spread of students' scores. For a normal distribution, 68% of all scores lie within the range average plus or minus one standard deviation. In this case, 68% of the school's scores fall within the range 18 (22.2-4.4=17.8) to 26.6 (22.2+4.4=26.6), while for the region 68% of all scores fall within the range 13.2 to 24.4.

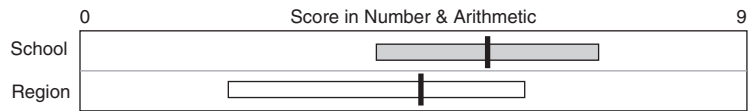
Section 2.2 Year 9

2012 Mathematics - Year 9 - Analysis

The graphs below show the performance of your Year 9 students in each of the different areas assessed.

Number & Arithmetic

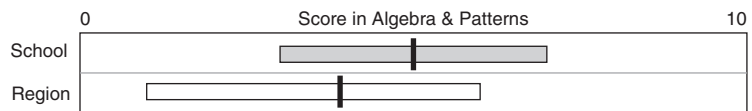
	School	Region
Number Of Questions	9	9
Average Score	5.5	4.6
Highest Score	8	9



Questions 3, 4, 8, 9, 16, 22, 29, 36, 40

Algebra & Patterns

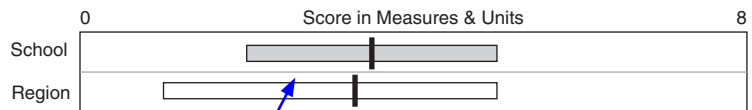
	School	Region
Number Of Questions	10	10
Average Score	5.0	3.9
Highest Score	9	10



Questions 6, 10, 15, 20, 26, 30, 31, 37, 38, 39

Measures & Units

	School	Region
Number Of Questions	8	8
Average Score	3.5	3.3
Highest Score	6	8



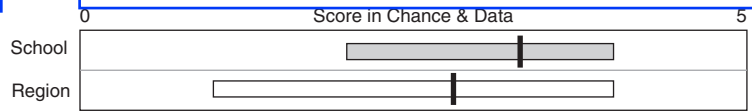
Questions 1, 17, 19, 21, 25, 27, 34, 35

This table compares the performance in the Measures & Units skill area, of students from this school with the performance of students from the region. The average score for this school (3.5) was slightly higher than for the region (3.3). The highest score for the school was 6 and for the region it was 8.

This graph compares the performance in the Measures & Units skill area, of students from this school with the performance of students from the region. In this example, the average score for the school is slightly higher than for the region. However, looking at the spread of scores, the difference between the average scores is probably too small to be statistically significant.

Chance & Data

	School	Region
Number Of Questions	5	5
Average Score	3.3	2.8
Highest Score	5	5



■ average score □ performance range excluding the top 10% and bottom 10% (not shown if fewer than 10 students)

Questions 2, 11, 18, 24, 32

2012 Mathematics - Year 9 - Question Analysis

The table below lists all questions in order of difficulty.

The **Question content** column lists the skill each question is assessing.

	Question content	Area assessed	Question number	Correct answer	School percentage correct	Region percentage correct	Strength / weakness
Difficult Questions	Work systematically to solve a complex puzzle involving whole numbers	Number & Arithmetic	40	901	7	3	S
	Solve a word problem involving combinations	Algebra & Patterns	39	9	11	7	S
	Solve a word problem involving ratios	Number & Arithmetic	36	108	30	9	S
	Solve a measurement problem involving the area of squares	Algebra & Patterns	37	3	19	10	S
	Solve a measurement problem involving scale	Measures & Units	27	C	3	10	W
	Match a graph to a given linear equation	Algebra & Patterns	38	83	27	19	S
	Find the angle between the hour hand and the minute hand of a clock	Chance & Data	32	D	23	21	
	Find the inequality that best describes a variable	Number & Arithmetic	29	A	27	21	S
	Solve a complex probability problem	Measures & Units	21	A	46	24	S
	Solve a multi-step measurement problem	Algebra & Patterns	31	C	36	25	S
Easy Questions	Solve a measurement problem involving scale	Measures & Units	35	B	22	26	
	Find the area of a circular pond given its diameter	Algebra & Patterns	26	B	32	29	
	Find the volume of a prism with a square base	Space & Geometry	14	B	20	29	W
	Identify a practical situation as having the properties of an	Algebra & Patterns	30	C	30	30	
	Substitute into a formula to find an unknown that is not the	Chance & Data	24	C	45	31	S
	Convert a percentage to a decimal	Measures & Units	34	A	33	33	
	Identify a reflection in the x-axis of a number plane	Space & Geometry	33	D	46	37	S
	Identify the shape that cannot be drawn on a given grid	Space & Geometry	28	A	50	38	S
	Solve a number puzzle	Measures & Units	19	B	24	38	W
	Find the dimensions of a triangular prism similar to a given	Number & Arithmetic	22	C	61	53	S
	Find an expression to represent a linear relation given in a		18	C	72	54	S
	Simplify an algebraic expression		17	B	56	56	
	Recognise two solids based on given features		9	D	69	66	
	Solve a word problem involving percentages		12	B	84	66	S
	Identify the line graph that represents a relation given in co		10	A	88	68	S
	Find the mean of a simple set of data	Chance & Data	2	B	97	81	S
	Solve a word problem involving ratios	Number & Arithmetic	4	D	92	82	S
	Find the time three and a half hours after a given time	Measures & Units	1	C	93	84	S
	Order integers in ascending order	Number & Arithmetic	3	A	92	85	S
	Compare data in a back-to-back graph	Chance & Data	11	D	93	90	

The **Area assessed** column lists the broader skill area which each question is assessing. There are five skill areas in Year 9 Mathematics. Other subjects will have different skill areas.

The **Question number** column lists each question with the most difficult at the top and the least difficult at the bottom according to the region's scores. The most difficult question was Q40 with 3% of students in the region giving the correct answer, 7% of students at this school gave a correct answer for this question. The least difficult question was Q11 with 90% of students from the region and 93% of students at this school giving the correct response.

The **Correct answer** column lists the correct answers, A, B, C or D for only the multiple choice questions.

Understanding Question Difficulty, Strengths and Weaknesses

Question difficulty is determined by the number of students in Australia who answer the questions correctly. Strength in a question (indicated by 'S') means that students in your school performed significantly better on that question compared to the performance of students in Australia. Weakness in a question (indicated by 'W') means that students in your school performed poorly in comparison. Strengths and weaknesses are not shown if fewer than 20 students from your school participated.

For more details on how to interpret results please visit our website at www.eaa.unsw.edu.au/school-results

2012 Mathematics - Year 9 - Student Response Analysis

The skill area assessed by the question is listed in the **Area assessed** column.

The table below provides a detailed description of the skill assessed by each question and the percentage of your students who chose each response option. The correct answer is the white, unshaded option.

Question content	Area assessed	School percentage				Non attempt
		A	B	C	D	
1 Find the time three and a half hours after a given time	Measures & Units	5	1	93	1	0
2 Find the mean of a simple set of data	Chance & Data	0	97	2	1	0
3 Order integers in ascending order	Number & Arithmetic	92	0	1	7	0
4 Solve a number puzzle	Number & Arithmetic	0	7	1	92	0
5 Recognise the properties of shapes	Space & Geometry	85	9	5	1	0
6 Simplify algebraic expressions	Algebra & Patterns	2	2	91	4	0
7 Identify the properties of shapes	Space & Geometry	75	8	15	2	0
8 Solve a number puzzle	Number & Arithmetic	2	2	94	1	1
9 Solve a number puzzle	Number & Arithmetic	0	11	20	69	0
10 Find an expression to represent a linear relation given in a table	Algebra & Patterns	88	4	2	6	0
11 Compare data in a back-to-back graph	Chance & Data	1	4	1	93	0
12 Find the dimensions of a triangular prism similar to a given one	Space & Geometry	2	84	10	4	0
13 Find the area of a composite figure	Geometry	61	8	7	24	1
14 Find the area of a composite figure	Geometry	3	20	71	7	0
15 Find the area of a composite figure	Algebra & Patterns	6	4	15	75	1
16 Find the area of a composite figure	Number & Arithmetic	75	12	13	0	1
17 Find the area of a composite figure	Measures & Units	29	56	10	6	0
18 Find the area of a composite figure	Chance & Data	5	10	72	13	1
19 Find the area of a composite figure	Measures & Units	25	24	8	40	3
20 Find the area of a composite figure	Algebra & Patterns	3	90	4	4	0
21 Find the area of a composite figure	Measures & Units	46	12	40	1	1
22 Find the area of a composite figure	Number & Arithmetic	1	32	61	6	0
23 Find the area of a composite figure	Geometry	8	71	13	8	0
24 Find the area of a composite figure	Chance & Data	16	21	45	18	0
25 Find the area of a composite figure	Measures & Units	8	76	10	6	1
26 Find the area of a composite figure	Algebra & Patterns	35	32	16	16	1
27 Find the area of a composite figure	Measures & Units	13	7	3	77	0
28 Find the area of a composite figure	Geometry	50	21	20	7	2
29 Find the area of a composite figure	Number & Arithmetic	27	21	43	8	1
30 Find the area of a composite figure	Algebra & Patterns	14	27	30	26	2
31 Find the area of a composite figure	Algebra & Patterns	23	30	36	11	0
32 Find the area of a composite figure	Chance & Data	3	10	63	23	1
33 Find the area of a composite figure	Geometry	1	13	38	46	1
34 Find the area of a composite figure	Measures & Units	33	40	18	6	3
35 Find the area of a composite figure	Measures & Units	30	22	37	10	1
36 Solve a word problem involving ratios	Number & Arithmetic	Free Response				18
37 Solve a measurement problem involving the areas of squares	Algebra & Patterns	Free Response				21
38 Solve a number puzzle	Algebra & Patterns	Free Response				28
39 Solve a word problem involving combinations	Algebra & Patterns	Free Response				30
40 Work systematically to solve a complex puzzle involving whole numbers	Number & Arithmetic	Free Response				38

The **Question content** column lists a detailed descriptor of the skill assessed by each question.

These columns list the responses, both correct and incorrect, to the multiple-choice questions of students from this school. The correct answer to each multiple-choice question is found in a white, un-shaded cell. Each multiple choice question has only one correct response (the **key**). The incorrect responses (**the distractors**) are in the shaded cells. The **non-attempt** cell lists the percentage of students who did not select one of A, B, C or D. Free response questions do not list the option percentages.

In this example, the correct answer to Question 33 is D. The correct answer was chosen by 46% of students in this school. The distractor C drew 38% of students, distractor A drew 1% of students and distractor B drew 13% of the students. One student made a non-attempt.

Distractors are plausible but incorrect options that are designed to appeal to the unprepared candidate. **Distractor analysis** is a powerful tool made available to teachers in this report. An analysis of the reasons students had for choosing a distractor could point to specific weaknesses in student understanding of the subject. Analysis of the number of non-attempts may also be useful.

Understanding Student Response Analysis

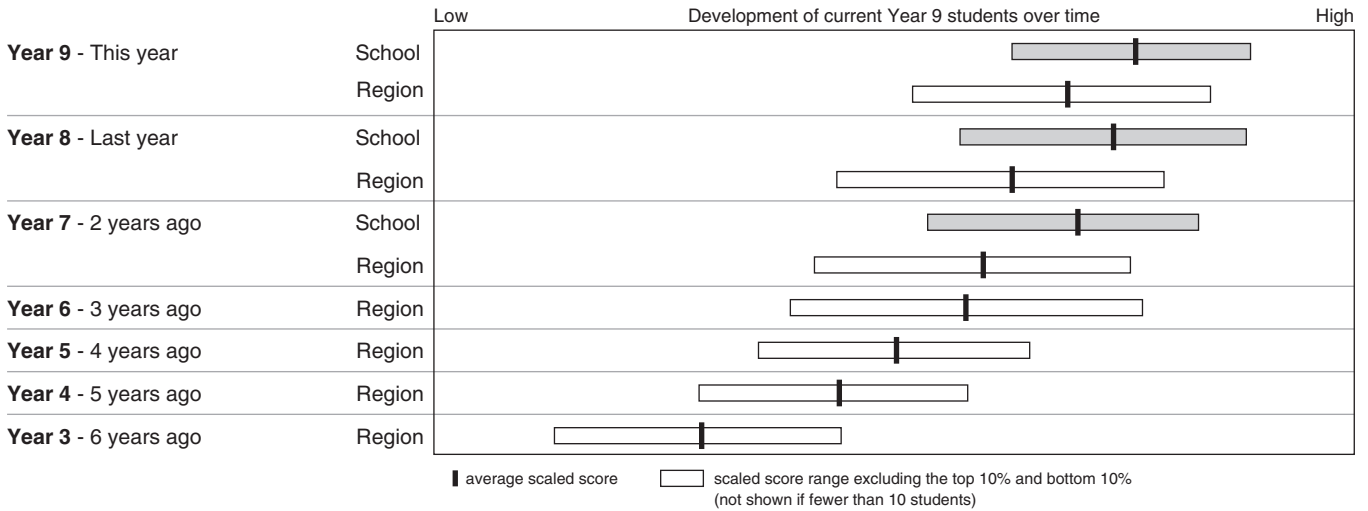
For each multiple choice question there are four response options. The correct answer is the white, unshaded option. Incorrect options are called distractors and are shown in grey. Examining the distractors can give a useful insight into the type of assistance needed by students who have answered a question incorrectly. For example, if a number of students answered 'B' where the correct response was 'A', examining the distractor 'B' can help identify a lack of skill or understanding that led the students to the wrong response.

For more details on how to interpret results please visit our website at www.eaa.unsw.edu.au/school-reports

Section 2.7 Year 9

2012 Mathematics - Year 9 - Development of Students Over Time

The graph below shows the development of current Year 9 students for the past seven years. Schools that have participated for eight or more years can access this additional information online.

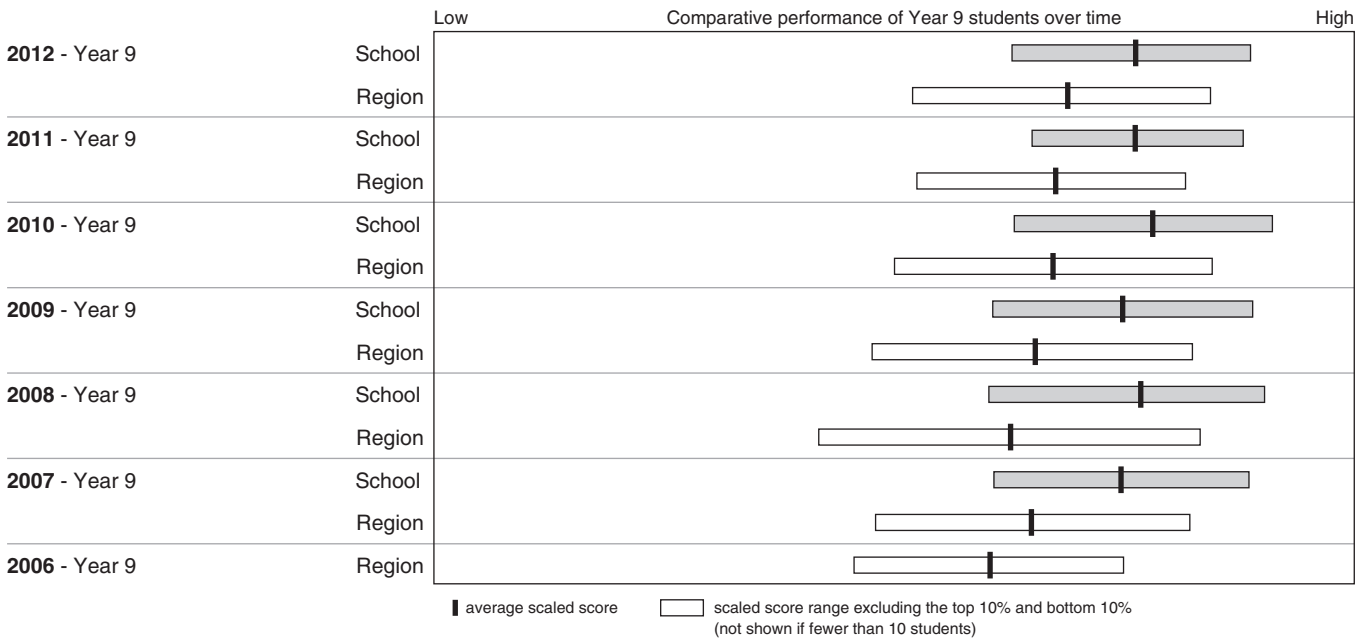


This graph compares the performance of this Year 9 group of students in this school* over a number of years with corresponding students in the region. In this example the current Year 9 students in this school are compared with their performance in the previous year (when they were in Year 8 and Year 7). The average performance of all students measured on the same scale has improved over time.

Section 2.8 Year 9

2012 Mathematics - Year 9 - Comparison of Different Students Over Time

The graph below compares the performance of Year 9 for the past seven calendar years. Schools that have participated for eight or more years can access this additional information online.



This graph compares the performance over a number of years of different groups/Year levels in this school with corresponding students in the region. In this example the performance of Year 9 students in the school are compared to all Year 9 participants in the region in the previous seven calendar years (if available). This allows you to answer questions like 'Is this year's Year 9 doing as well as last year's Year 9?'

*The performance of any group from one year to another may not be strictly comparable because exactly the same students may not be present in successive years due to transfers and absences, but broad comparisons can be made.

Section 2.9 Year 9

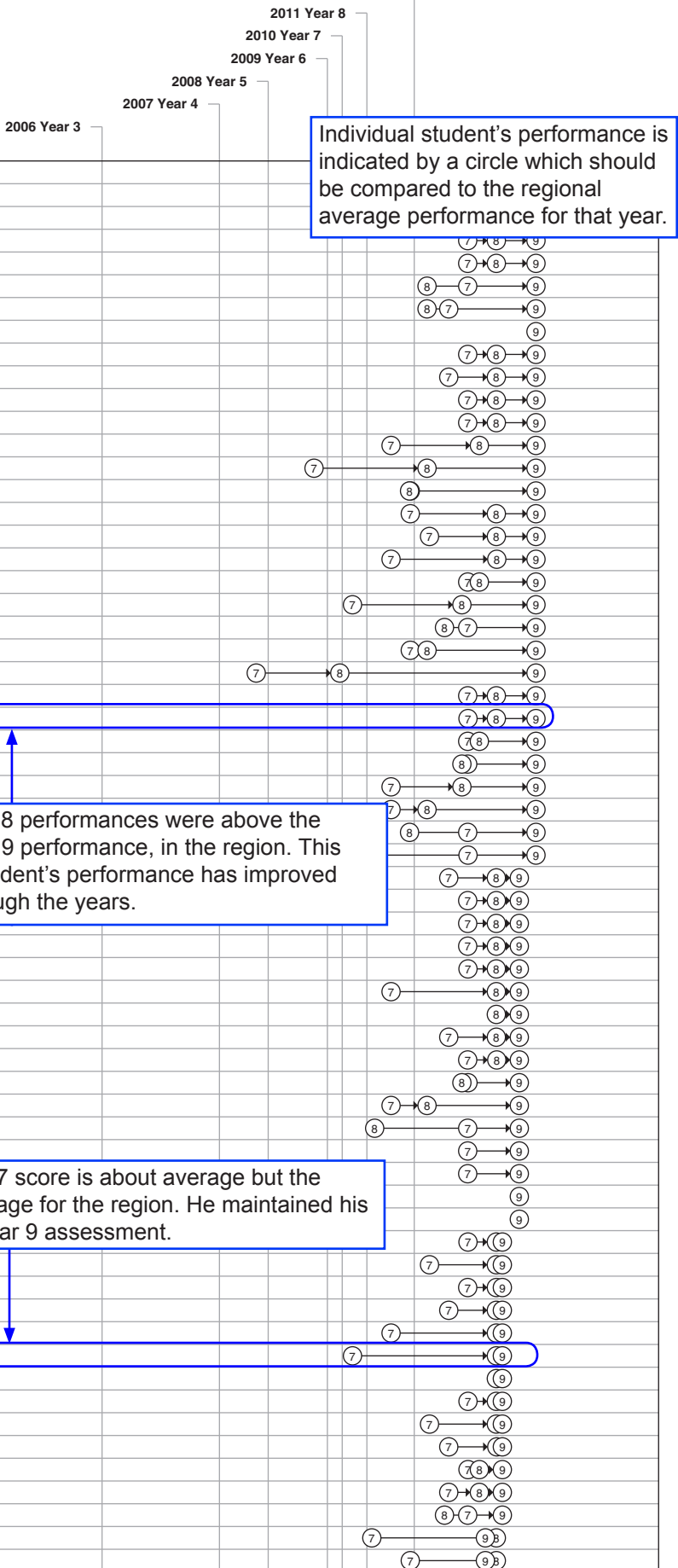
2012 Mathematics - Year 9 - Individu

The table below lists all students ordered by raw score and shows their performance for each year.

This table lists all students from a single cohort within this school. The students are ordered from highest raw score at the top of the table down to lowest raw score.

The graph shows the performance of each individual student over a number of years. The vertical lines show the average performances for the region for each year. In this case the lines show the averages for the past years when these students were in Year 8 and Year 7.

Student Name	Score	Low
350 D'SOUZA, MICHAEL	31	
330 SINDONE, JAMES	31	
313 NICOTRA, DOMINIC	31	
320 GOODMAN, JAMES	30	
349 DAINTON, JAMES	29	
352 COLLINS, DANIEL	29	
299 CACCAMO, JOSHUA	29	
339 MASTRANGELO, STEVEN	29	
332 RYAN, CALLUM	28	
329 SOEPARDI, BRYAN	28	
337 MENDES, TOM	28	
225 JACKSON, CONNOR	28	
333 PIERCE, JACKSON	28	
322 CRAWFORD, MAXWELL	28	
297 D'CRUZ, MATTHEW	28	
309 RIISFELDT, HUGH	27	
276 WATERS, JAMES	27	
354 BOUNDS, MICHAEL	27	
338 MCCLATCHEY, JACK	27	
325 BRIMSON, LACHLAN	27	
346 HAYES, GIANLUCA	27	
280 STILIN, KONRAD	27	
245 GRACE, BEN	27	
351 COLLINS, MILES	26	
318 HOLLOWAY, JAMES	26	
336 OTT, THEO	26	
316 LEWIS, TOBIAS	26	
243 KENDRICK-SMITH, JOE	26	
282 NISSEN, BEN	26	
345 HAYES, STEPHEN	26	
314 MCLELLAN, BEN	26	
287 HICKEY, JOSEPH	26	
344 HEDDLE, JOSHUA	26	
305 WADE, WILLIAM	26	
341 KYRIAZIS, BENJAMIN	25	
343 HUGHES, TIMOTHY	25	
328 STYLIANAKIS, GEORGE	25	
340 LEWIS, JOHN	25	
347 FELTHAM, ALEXANDER	25	
334 PERRY, SEBASTIAN	25	
311 RAESIDE, TOM	25	
241 MCLAUGHLIN, ANDREW	25	
326 BAIN, MATTHEW	25	
353 CALOV, WILLIAM	25	
289 GRANT, JAMES	25	
296 DALY, PATRICK	25	
275 WHELAN-YOUNG	25	
335 PACAK, MARTIN	25	
355 BELL, WILLIAM	24	
324 CHAMBERS, BENJAMIN	24	
257 PIGOTT, DANIEL	24	
308 SMITH, LAURENCE	24	
229 MACWHITE, LIAM	24	
348 FARLEY, NED	24	
331 SCOTT, DECLAN	24	
288 HERTZ, JOSHUA	24	
277 THOMAS, JACK	24	
252 WEISS, JAMIESON	24	
286 KELLY, DANIEL	24	
317 KELLEHER, ROBERT	24	
279 SUNDERLAND, PATRICK	23	
300 BENITEZ, LORENZO	23	



Individual student's performance is indicated by a circle which should be compared to the regional average performance for that year.

James Holloway's Year 7 and Year 8 performances were above the average, even better than the Year 9 performance, in the region. This year James is in Year 9 and the student's performance has improved showing a steady progression through the years.

By contrast, Liam Macwhite's Year 7 score is about average but the Year 8 score is well above the average for the region. He maintained his scores above the average in the Year 9 assessment.

2012 Mathematics

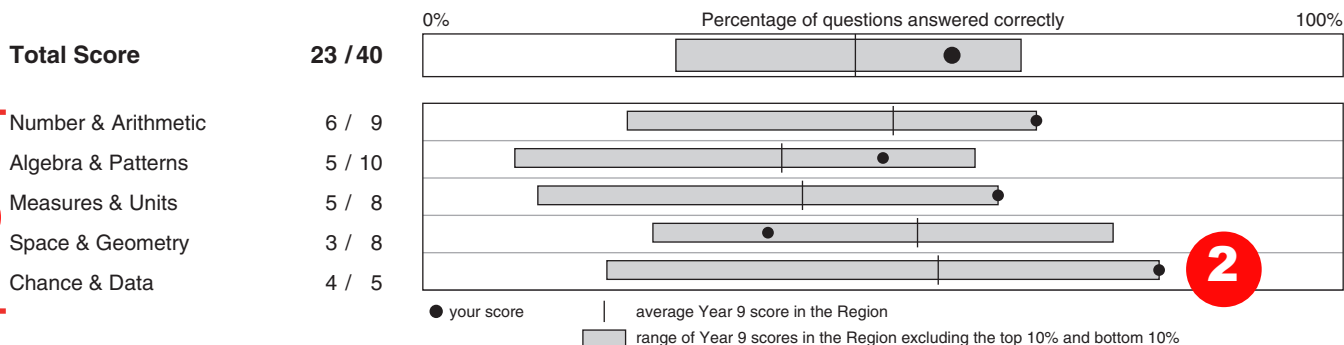
International Competitions and Assessments for Schools

Dear Hugh

Thank you for participating in the 2012 International Competitions and Assessments for Schools - Mathematics. You scored **23 out of 40**. Your score was **in the top 20 percent** of Year 9 participants in the Region.

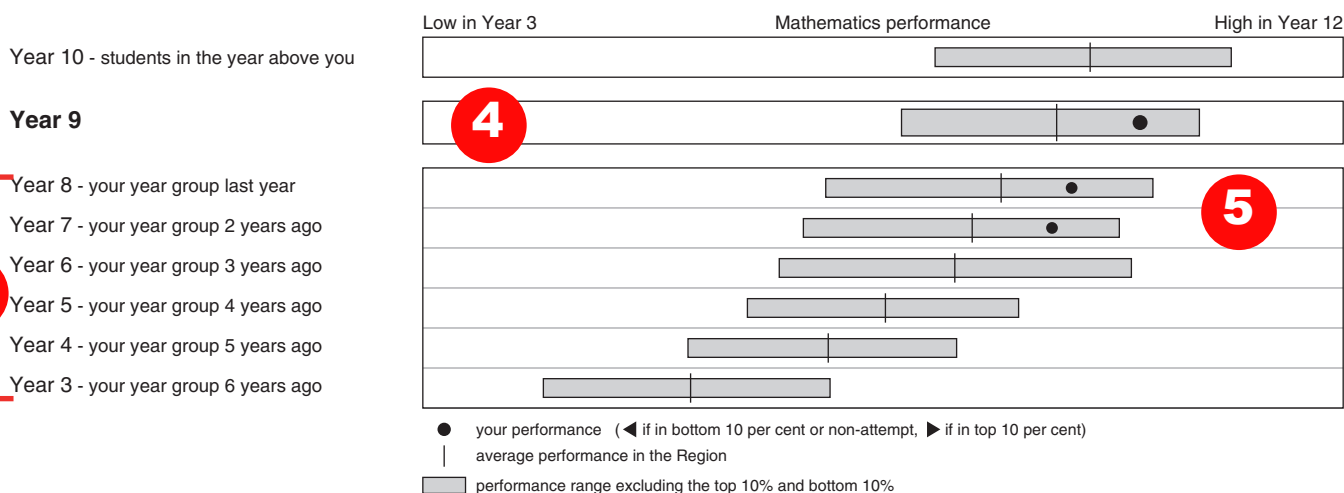
2012 Mathematics Performance

The graph below shows your **2012 Mathematics score** and your performance in each of the different areas assessed.



Comparative Mathematics Performance

Students in the Region from Year 3 to Year 12 participated in the International Competitions and Assessments for Schools - Mathematics. The graph below compares your performance to year levels above and below (where available for the last eight years).



1 This section compares Hugh's performance in each of the skill areas assessed with the performance of all students who sat ICAS-Mathematics. The graph indicates which areas may be strengths and weaknesses for Hugh Marks.

2 Hugh performed well above average in the skills areas of Number & Arithmetic, Measures & Units and Chance & Data. This result may indicate an area of strength for Hugh.

3 This section tracks Hugh's performance on the assessment in previous years. This allows for the measurement of Hugh's progress over time, relative to the other students in Hugh's year.

4 This graph compares Hugh's performance on this year's assessment to the performance of the other Year 9 students.

5 Hugh has shown significant progression since Year 7. When he was in Year 7, Hugh was above the year average. In Year 8, Hugh improved a little over Year 7 and in Year 9 he maintained his performance above the average for his year.