

NAPLAN Data Service

A guide to the

Relative Growth Report

including the Transitional Relative Growth Report



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NOTE: This document references Relative Growth calculated from individual score points for the paper-based NAPLAN tests. While the methodology and interpretation are still relevant, the introduction of NAPLAN Online means that there are now very many more possible scores for each test. Single score points from two years prior are now combined into similar groups as a basis for the calculation. If there are insufficient students with similar scores from two years prior, no meaningful relative growth category can be calculated.

Relative Growth Report

The **Relative Growth Report** was introduced in 2012 and replaced the Student Comparison Report in the NAPLAN Data Service. It is available for current Year 5, Year 7 and Year 9, and shows comparisons to previous NAPLAN results from Year 3, Year 5 and Year 7 respectively.

In 2016 a supplementary report - the **Transitional Relative Growth Report** - was included. This report allows schools with students in Year 5, but not in Year 7, to view group level data showing the relative growth made by past students across the transition to Year 7.

This document contains background information on both the Relative Growth and the Transitional Relative Growth Reports, and provides some examples of the ways in which they may be used in schools.

What does the Relative Growth Report show?

The Relative Growth Report shows the level of growth for each student **relative** to students that had the same NAPLAN score two years ago. This enables schools to make more informed judgements about a student's progress than can be achieved by just looking at the scaled score differences between testing periods.

A key feature to the report is that each student's level of relative growth has been categorised as 'high', 'medium' or 'low'.

The **tabular** version of the report shows the scaled score outcomes and the relative growth category (high, medium or low) for each student at the school that participated in the NAPLAN assessment. The report may be ordered by students' prior or current scores, or by student name, and may be viewed at a class or school level.

The **graphical** version of the report displays a summary of the relative growth levels achieved by students within a school or individual class. In addition the report displays these levels broken down by groups of different ability students from 2 years prior.

How is relative growth defined?

Each student's level of relative growth is determined by comparing their current year NAPLAN result to the results of the group of all **'similar'** Victorian students. 'Similar' students are defined as those that had the same NAPLAN score two years ago.

If, compared to the current year scores for similar students, a student's current year NAPLAN score is in the:

- highest 25%, their growth level is categorised as 'High'. (Green)
- middle 50%, their growth level is categorised as 'Medium' (Yellow), and
- lowest 25%, their growth level is categorised as 'Low' (Red).

Note that the percentages within each category will vary from school to school.

Why was the change made?

The previous Student Comparison Report displayed student growth in terms only of the difference between the current year's NAPLAN scaled score and the scaled score from the relevant test two years prior.

While these differences could be compared to **average** growth between successive NAPLAN test years, individual growth varies greatly depending on the starting point. In general, student growth on the NAPLAN scale tends to be:

- greater when starting at a lower score 2 years prior, and
- less for students starting at a higher score 2 years prior.

This pattern has been observed in assessment programs around the world. It is generally understood that students achieve larger educational milestones lower on the assessment scale compared to more subtle milestones further along the assessment scale. As a result, scaled score increases do not always reflect a student's level of relative growth.

In the example shown in Table 1 for instance, is it true that Peter has made **better** educational progress in Numeracy between Year 3 and Year 5 than Jane?

Table 1: Comparing scaled score differences

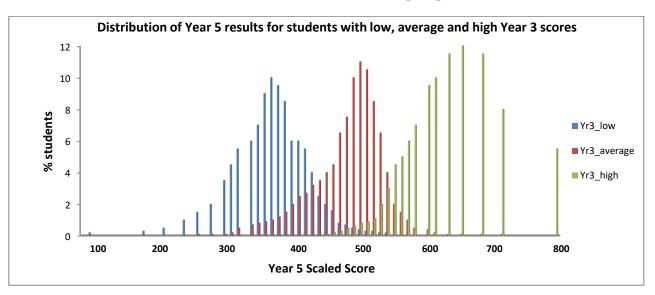
Student	Scaled score for N	Scaled Score Difference	
	Year 3 (2 years prior)	Year 5 (current year)	(growth)
Peter	410	450	40
Jane	590	620	30

The answer is "not necessarily".

How is relative growth different from a scaled score increase?

The graph below provides an example of the distribution of Year 5 NAPLAN scores for students who started with a typically low, average or high Year 3 score two years prior.

Results for Year 5 students from different 'similar student' groups

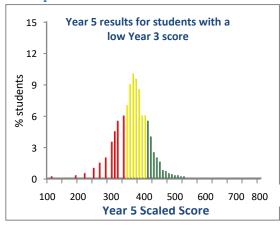


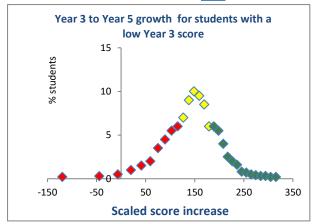
It is clear from the graph above that students who did well in Year 3 also tend to do well in Year 5. However, when the scaled score differences in their results are analysed, it can be shown that students from lower Year 3 ability levels have generally greater scaled score increases than those with higher Year 3 results.

The graphs on the following page show each of the three score distributions above, together with the distribution of the corresponding scaled score **differences** between the two testing periods. In each case, the graphs are colour-coded to indicate scores or increases associated with the bottom 25% (low relative growth), the middle 50% (medium relative growth) and the top 25% (high relative growth) of students in the group.

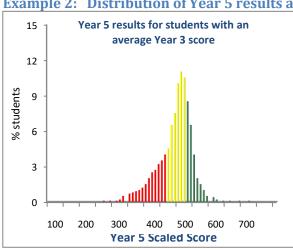
For all graphs: = low growth = medium growth = high growth

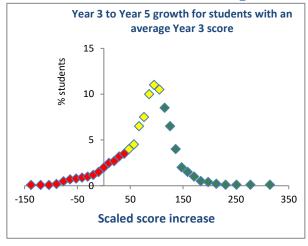
Example 1: Distribution of Year 5 results and increases for students with a low Year 3 score



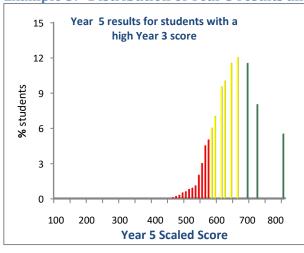


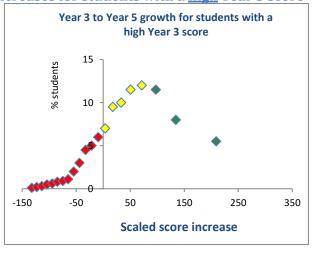
Example 2: Distribution of Year 5 results and increases for students with an average Year 3 score





Example 3: Distribution of Year 5 results and increases for students with a high Year 3 score





The graphs above show that while students who had a low score two years prior tend also to have low scores in the current year, the average **increase** in their scaled score result tends to be relatively high. Conversely, high scoring students two years prior tend also to achieve high scores in the current year, but their growth in terms of scaled scores tends to be relatively low.

The information depicted in the graphs is summarized in Table 2.

Table 2: Scaled score differences associated with different relative growth categories

NAPLAN Scal	ed Score		"Growth"			
Year 3	Year 5 Range	Range of Differences	Percentage of students	Relative Growth	Median	
(2 years prior)	(current year)	(Year 3 to Year 5)	(from given Year 3 score)	level	Growth*	
230	110 - 350	-120 - 120	Bottom 25%	Low		
Band 1 (a low score for	351 - 410	121 - 180	Middle 50%	Medium	150	
Yr 3)	411 - 550	181 - 320	Top 25%	High		
410	270 - 460 -140 - 50		Bottom 25%	Low		
Band 4 (an average	461 - 520	51 - 110	Middle 50%	Medium	80	
score for Yr 3)	521 - 730	111 - 320	Top 25%	High		
590	460 - 590	-130 - 0	Bottom 25%	Low		
Band 6+ (an above range	591 - 660	1 - 70	Middle 50%	Medium	35	
score for Yr 3)	661 - 800	71 -210	Top 25%	High		

^{*}Median growth: 50% of similar students had a greater increase, 50% had a smaller increase.

The data in Table 2 show that the middle 50% of students with a scaled score of 230 in Year 3 achieved a Year 5 score in the range 351-410, giving them an increase of between 121 and 180 scaled score points. In **relative** growth terms, this is **medium** growth for these students. For students starting with the much higher Year 3 score of 590 however, it is much harder to achieve this sort of actual growth. Any student in this group who had an increase of 121-180 scaled score points would fall into the **high** relative growth category, since the top 25% of students with a Year 3 score of 590 have growth in the range 71-210.

The data illustrate the fact that students with the same scaled score difference do not necessarily have the same relative growth – and vice versa. For example, if a student has an increase of 100 scaled score points between Year 3 and Year 5 NAPLAN tests, his or her relative growth could be categorized as high, medium or low – depending on their Year 3 score two years prior. Conversely, a student with high relative growth between these two testing periods may have had actual growth as small as 71 scaled score points (for Year 3 score of 590) or as large as 320 scaled score points (for Year 3 score of 230).

Similarly, for the example in Table 1, it is clear that Peter achieved a greater scaled score increase in Numeracy between Year 3 and Year 5 than Jane did (40 scaled score points compared to 30). However, given Peter's Year 3 starting point (410), an increase of 40 scaled score points puts him in the **low** relative growth category, while Jane's increase of 30 scaled score points indicates **medium** relative growth for students with her Year 3 score of 590. This is illustrated in Table 3 which presents the data from Table 1 again, but includes a Relative Growth column.

Table 3: Scaled Score differences and Relative Growth

	Scaled score for I	NAPLAN Numeracy	"Growth"			
Student	Year 3 (2 years prior)	Year 5 (current year)	Scaled Score difference	Relative Growth		
Peter	410	450	40	Low		
Jane	590	620	30	Medium		

How does the NAPLAN Data Service report relative growth?

The Relative Growth Report can be viewed as a **tabular** report, showing test results and relative growth for each student. Alternatively, summary data for the school or class can be viewed in the **graphical** report which shows the percentage of students in the school or class in each of the low, medium and high relative growth categories. The information is also shown grouped by the students' NAPLAN band scores from two years prior.

(i) Tabular report - student level display

The tabular report shows student growth relative to 'Similar Students' – i.e. to students who had the same score on the test two years prior. An example is given in Table 4.

Table 4: Example of tabular report for Year 9 students

Student Name	YR 7 Stude (2 years		Relative growth for	YR 9 Student Scores (current year)		
	Scaled Score	Band	YR 7 to YR9	Scaled Score	Band	
Black, Betty	365	<4	Medium	489	6	
Grey, Graham	404	4	High	503	6	
Green, George	466	5	Medium	530	7	
Lemon, Lily	487	6	Low	503	6	
Brown, Brittany	560	7	Low	564	7	
Tan, Tracey	662	9	Medium	681	9	
Silver, Sam	707	>9	High	714	10	
White, Willy	NA	NA		616	8	

The scaled score, and the associated NAPLAN band, is given for each student for both the current year and for the corresponding test 2 years prior. The 'Relative growth' column is colour-coded to indicate whether the student has made low, medium or high growth, **relative to similar students** (ie. relative to students with the same score 2 years prior).

Where a student's allocated scaled score falls outside the 6 band range reported for their year level, this is indicated by '<' (below range) or '>' (above range) in the Band column. 'NA' is used to indicate that the student did not receive a result for the test.

The default sort order on this report lists students from lowest to highest score on the tests two years prior. This allows schools to see the relative growth achieved for students from similar starting points. The data may also be sorted by student name, growth category or current year score.

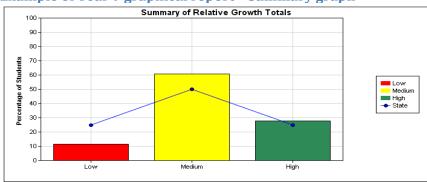
(ii) Graphical report - school or class level

The graphical report displays two graphs. The first presents summary data as a column graph showing the percentage of students in the school or class in each of the low, medium and high relative growth categories. A second graph shows this information grouped by the students' NAPLAN band scores from two years prior. In both cases, the graphs are supported by tables showing the data numerically.

The summary graph should be referenced by the fact that, from any given score point 2 years prior, 25% of Victorian students will have low relative growth, 50% will have medium relative growth and 25% will be in the high relative growth category.

In the Year 7 to Year 9 example below, the school has close to the expected number of students with high relative growth, more than the expected number with medium relative growth but fewer than expected in the low relative growth category.

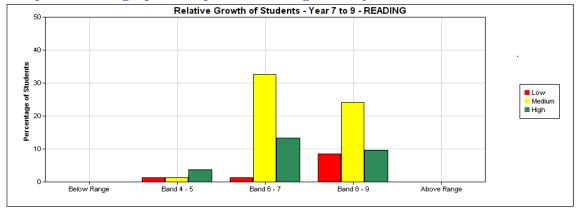
Example of Year 9 graphical report - summary graph



	Low	Medium	High	Totals
Percentage of students - state	25	50	25	100
Percentage of students - school	11.32	60.38	28.30	100
No of students - school	18	96	45	159

This information is also presented grouped by students' Year 7 NAPLAN bands. This enables schools to quickly identify if, for example, high or low relative growth is associated with a particular ability group.

Example of Year 9 graphical report - relative growth by Year 7 NAPLAN band



		Below range				Band 4 - 5			Band 6 - 7	1		Band 8 - 9		Δ	e	
		Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
st	% of tudents	0	0	0	1.26	1.26	4.40	1.26	33.96	14.47	8.81	25.16	9.43	0	0	0
	No. of tudents	0	0	0	2	2	7	2	54	23	14	40	15	0	0	0

Transitional Relative Growth Report

The Transitional Relative Growth Report is available to schools that have students in Year 5, but not in Year 7. The report shows the relative growth made by the cohort of Year 5 students who sat the NAPLAN tests at the school two years prior and for whom a current Year 7 NAPLAN result can be found at a different school.

The Transitional Relative Growth Report is equivalent to the graphical version of the Year 5 to 7 Relative Growth Report except that

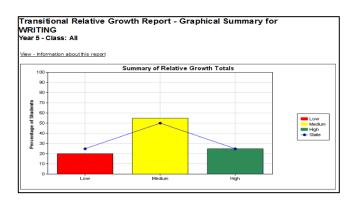
- the school group of interest is the Year 5 cohort from 2 years prior to the current testing year
- the report is accessed from the reporting year option for the Year 5 cohort of interest not from the current reporting year.

The data provided in the Transitional Relative Growth Report is from a "looking forward" perspective (from Year 5 two years prior to a current Year 7), rather than from the "looking back" (to a previous Year 5 from a current Year 7) perspective.

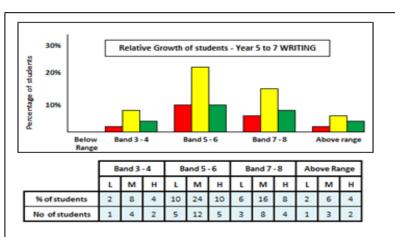
The report does **not** display results for individual students, and is not provided for cohorts of less than 10 students. It provides primary schools with a means of reviewing and assessing their year 5 and 6 Teaching and Learning programs with reference to the relative growth achieved in current NAPLAN results by the group of students who have recently transitioned to Year 7 at a different school.

The example below shows virtually "as expected" relative growth from Year 5 to Year 7 in Writing. The 20:54:26 ratio of percentages in the low, medium and high categories is close to the 25:50:25 ratio which is fixed for the state, and the growth category ratios remain fairly consistent across the spread of Year 5 outcomes.

Example of Year 5 to Year 7 transitional relative growth for Writing.



The percentages of students who have gone on to make low, medium or high relative growth in Year 7 Writing are 20%, 54% and 26% respectively. These closely reflect the 25:50:25 state ratios, with just slightly fewer students in the *Low* category and slightly more in *Medium* one.



The distribution of low, medium and high relative growth for students who have transitioned to Year 7 is fairly consistent across the range of Year 5 outcomes.

How can the Relative Growth and Transitional Relative Growth Reports be used in schools?

1. Individual Student Performance

(not available for the Transitional relative Growth Report)

By using the tabular version of this report schools can identify students that have high, medium or low relative growth in any or all of the test domains.

In particular the report can help identify students whose progress may not be obvious just by looking at their scaled score or NAPLAN band results. These would include, for example, students who:

- are performing at a low level but have made great progress since the last assessment, or
- are performing at a high level but may not have made as much progress as may have been expected.

2. Class/School Performance

(available for both Relative Growth and Transitional Relative Growth Reports)

By using the graphical version of the report, schools can identify the general pattern of their students' relative growth for a year level or individual class for particular test domains. Along with other local information, the relative growth information can be useful when evaluating the effectiveness of teaching and learning programs delivered at the school.

The report also shows this information broken down by the students' NAPLAN band results from two years prior. This enables schools to gain a sense of any student ability group that has shown unexpectedly high or low growth.

Schools are encouraged to use this report to look for general patterns within particular test domains. These may include instances where:

- students with lower ability have made high growth, but students of higher ability have made low growth, or
- students with higher ability have made high growth, but students of lower ability have made low growth.

Patterns such as these provide important feedback for the evaluation of teaching programs.

It may also be useful, at both student and school levels, to identify differences between relative growth patterns for different test domains.

Summary

The following pages contain annotated examples which illustrate how the Relative Growth and Transitional Relative Growth Reports provide a basis for making more informed judgements about student progress. In particular, they show that high achievement scores are not always synonymous with high growth, and conversely, neither low achievement scores nor small scaled score increases are necessarily associated with low growth between testing periods.

Annotated examples

Example A: Reading and Numeracy Year 3 to Year 5

At the Class Level

Table 5 shows relative growth in **Reading** for a class of Year 5 students.

As with the interrogation of any data report, it can be helpful to keep in mind the following questions:

- Is this what I EXPECTED to see?
- Is this what I WANTED to see?
- If not, what can be done at the school or classroom level to improve the results?

It is clear from the data in Table 5 that the class includes some very high achieving students. There are several 'above range' scores at both Year 3 (Band >6) and Year 5 (Band >8). Furthermore, no student started with a result below or at the Year 3 National Minimum Standard (Band 2), and all Year 5 outcomes are at or above the National Minimum Standard (Band 4).

On the face of it, this is an excellent set of results for the class in question.

Also pleasing to the school would be the fact that, overall, Low:Medium: High relative growth ratio is 16% (low): 48% (medium):36% (high). Considerably more than the expected 25% of students have made 'high' relative growth between the testing periods, and fewer than expected have shown only 'low' relative growth. This can be verified on the summary chart in the graphical version of the report.

Relative growth summary for Year 5 Reading example

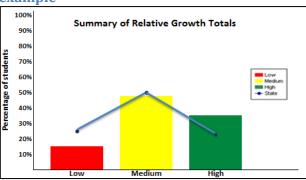


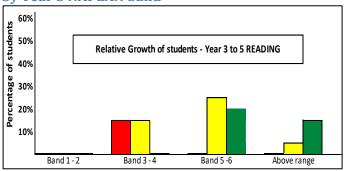
Table 5
READING ordered by Year 3 Student Scores
Year 5 - Class: 5K, Growth Category: All

Year 3 Student	t Scores	Relative Growth for	Year 5 Student	Scores
Scaled Score	Band	YR-3 to YR-5	Scaled Score	Band
346	3	Medium	446	5
346	3	Medium	467	5
356	3	Low	384	4
367	3	Medium	467	5
367	3	Low	405	4
377	4	Low	426	5
398	4	Medium	477	5
408	4	Low	446	5
440	5	High	557	7
464	5	Medium	509	6
477	5	Medium	509	6
477	5	Medium	557	7
491	6	High	622	8
491	6	Medium	532	7
491	6	Medium	544	7
506	6	High	645	>8
506	6	High	674	>8
524	6	Medium	557	7
524	6	High	622	8
544	>6	Medium	603	8
544	>6	High	674	>8
544	>6	Medium	557	7
544	>6	High	622	8
571	>6	High	674	>8
571	>6	High	716	>8

The issue to address here is that there is a definite **pattern** in the relative growth levels. The high growth levels are being achieved only by the high ability students. No student with a Band 3 or 4 Year 3 result has achieved high relative growth.

This can be seen in the graph displaying relative growth with respect to the Year 3 NAPLAN band results from two years prior.

Relative growth for Year 5 Reading example, by Year 3 NAPLAN band



	Ba	and 1 -	- 2	Ва	Band 3 – 4		Band 5 - 6			Above range		
_	L	М	Н	L	М	Н	L	М	Н	L	М	Н
% of students	0	0	0	16	16	0	0	24	20	0	8	16
No of students	0	0	0	4	4	0	0	6	5	0	2	4

The pattern identified above suggests that while the Reading program at the school provides for excellent extension of the top students, it does not cater as well for enabling lower or average ability students to show similar progress.

In order to identify whether this issue is a general one, or specific to the Reading domain only, the Relative Growth reports for other domains can be analysed.

The tabular report for **Numeracy** (Table 6) is shown below. Here again, the students have generally achieved above average results at both year levels. Also, as was seen in Reading, the overall percentage of students making high relative growth between testing periods (36%) is well above the expected 25%, and there are again fewer than expected (20%) in the low growth category.

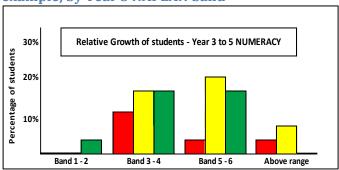
Table 6
NUMERACY ordered by Year 3 Student Scores
Year 5 - Class: 5K, Growth Category: All

Year 3 Studen	t Scores	Relative Growth for	Year 5 Student	Scores
Scaled Score	Band	YR-3 to YR-5	Scaled Score	Band
321	2	High	529	6
358	3	Low	416	4
358	3	High	520	6
358	3	Medium	445	5
382	4	Low	416	4
382	4	High	520	6
382	4	High	510	6
394	4	Medium	510	6
394	4	Medium	482	6
406	4	Low	445	5
418	4	High	622	8
418	4	Medium	482	6
431	5	Medium	482	6
431	5	Medium	520	6
431	5	High	560	7
444	5	Medium	550	7
444	5	High	637	>8
458	5	Medium	560	7
472	5	Medium	550	7
472	5	High	583	8
487	6	Low	510	6
522	6	High	622	8
541	>6	Low	539	7
541	>6	Medium	622	8
672	>6	Medium	720	>8

In Numeracy however, the growth categories as shown in the following graph, do not appear to be associated with any particular ability group. High relative growth has been achieved by some students with very low Year 3 scores, as well as by students with average and above average results in Year 3.

This more even distribution of growth across ability groups is seen in the graphical breakdown of relative growth for Numeracy. It indicates that the issue noted in Reading (of high growth being achieved only by the higher ability students) is domain specific, rather than of general concern.

Relative growth for Year 5 Numeracy example, by Year 3 NAPLAN band



	Ba	and 1	- 2	Ba	Band 3 – 4		Band 5 - 6			Above range		
_	L	М	Η	L	М	Н	L	М	Н	L	М	Н
% of studen	0	0	4	12	16	16	4	20	16	4	8	0
No o studen	0	0	1	3	4	4	1	5	4	1	2	0

At the Individual Student Level

NAPLAN consists of a number of single point in time assessments designed to complement and confirm other classroom assessments, and should generally provide a good indication of individual student ability. However, as with any single assessment tool, occasional anomalies will occur. If a student's test result varies considerably from teacher expectation, schools are advised to look for possible explanations for the differences, and to take these into consideration before making broad conclusions based on the results. NAPLAN results should never be considered in isolation from other classroom information.

For example, consider the results from the first row of Table 5. If this student's relatively low Year 3 result were due to their feeling unwell during the test for instance, then the high relatively growth observed may not be a true reflection of their progress.

Year 3	Year 3	Relative	Year 5	Year 5
Scaled Score	Band	Growth	Scaled Score	Band
321	2	High	529	6

Example B: Numeracy Year 7 to Year 9

Table 7 provides data relating to relative growth in Numeracy for a class of Year 9 students.

In contrast to the data seen in Example 1, these data show relatively low ability outcomes at both Year 7 and Year 9 levels.

There is, for example, no student in the class with a Year 9 result in the top band (Band 10), and less than half of the students have scores above the Year 9 National Minimum Standard (Band 6).

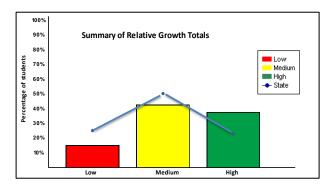
While these results may initially be a little disappointing, when they are viewed with reference to the Year 7 results from two years prior, and the relative growth made by the students between the testing periods, the story is very much more encouraging.

Table 7

NUMERACY ordered by Year 7 Student Scores Year 9 - Class: 9C, Growth Category: All

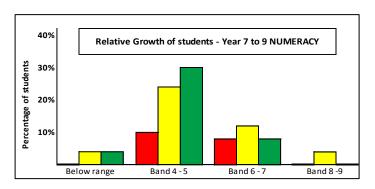
Year 7 Student Scores		Relative Growth	Year 9 Student Scores		
Scaled Score	Band	for YR-7 to YR-9	Scaled Score	Band	
357	<4	Medium	475	5	
369	<4	High	518	6	
408	4	Medium	475	5	
408	4	High	542	7	
416	4	Medium	486	6	
416	4	High	518	6	
423	4	Low	469	5	
423	4	High	522	6	
438	5	High	527	6	
444	5	Medium	518	6	
444	5	High	542	7	
444	5	High	556	7	
457	5	Low	481	6	
464	5	Low	462	5	
464	5	Medium	497	6	
464	5	Medium	502	6	
464	5	High	542	7	
464	5	High	575	7	
470	5	Medium	502	6	
470	5	Medium	512	6	
470	5	High	551	7	
481	6	Medium	537	7	
503	6	Low	518	6	
508	6	Medium	556	7	
529	6	Medium 570		7	
535	7	Medium	570	7	
566	7	High	631	8	
571	7	High	649	9	
577	7	Low	579	7	
582	8	Medium	609	8	

Not only has there been an improvement in terms of the percentage of students above the National Minimum Standard (from 30% in Year 7 to 47% in Year 9), the level of relative growth made by these students in Numeracy shows a greater than expected number of them are in the high growth category.



Furthermore, the growth appears to be achieved across all ability levels, indicating that the school has not concentrated on one group at the expense of another.

Given their Year 7 starting points, these students have in fact achieved very commendable results, especially for those students with Year 7 results at or below the National Minimum Standard.



	Below range		Band 4 - 5		Band 6 - 7		Band 8 - 9					
	L	М	Н	L	М	Н	L	М	Н	L	М	Н
% of students	0	3.3	3.3	10	23.3	30	6.7	13.3	6.7	0	3.3	0
No of students	0	1	1	3	7	9	2	4	2	0	1	0

Example C: Transitional Relative Growth

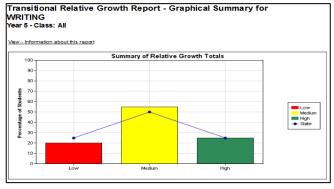
Year 5 (your school 2 years prior) to current to Year 7 (different school)

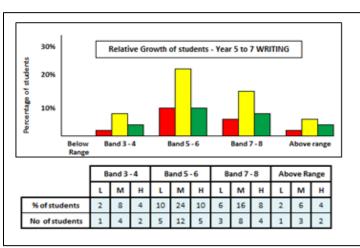
When using the Transitional Relative Growth report it is important to remember that there are a number of variables which can affect students' NAPLAN results, and especially for this report, many of them will fall outside the control or jurisdiction of the (Year 5) school. Clearly, for example, the style and standard of Year 7 programs will influence results and even with the same preparation, different students will react and respond differently to the changes associated with the transition from primary to secondary school.

Despite these limitations the Transitional Relative Growth Report can be a useful in helping schools to answer the question "How well are we preparing our students for secondary school?"

Consider the Writing example from page 9 again.

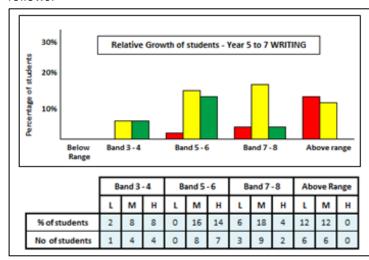
Transitional relative growth in Writing





The example shows very much "as expected" transitional relative growth in Writing. Furthermore, the second graph shows that distribution of low, medium and high relative growth is fairly consistent across the range of Year 5 outcomes.

Suppose however that, for the same summary graph, the breakdown by Year 5 scores had been as follows:



While the overall low:medium:high relative growth ratio (20:54:26)has not changed, the distribution of growth categories across the range of Year 5 outcomes is very different, and shows a definite tendency for low growth to be concentrated at the high end of the achievement scale. These sorts of results do warrant further investigation.

Some of the questions that may arise here include:

- Are the Year 5 results genuinely indicative of student ability? More than 25% of students had Above Range results in Writing Year 5, but more than half of these students are in the Low relative growth group in Year 7. Were the students 'over-prepared' for the Year 5 test?
- Has an extra effort been made at Year 5 and 6 to assist the lower performing students in Writing, at the expense of those who achieved higher scores?
- Is this pattern of results seen for these students in other test domains or is it restricted to Writing? Has this pattern occurred in the past?