



NWEA Research Report 2003.4
Preliminary study of growth index performance by school
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Background

The central mission of schools is to help nurture growth in children. Northwest Evaluation Association assists in this mission by developing assessments that are useful for measuring growth in the core academic subjects. NWEA has pioneered the use of growth-based measures by publishing the first nationally norms for student growth. The most current version of the norms (2002) include growth records from more than 250,000 students nationwide.

As we have gained experience with growth measures, our tools for assessing and reporting growth have improved in nuance and sophistication. One innovation is the introduction of the *growth index* score, which uses the 2002 norms to compare a student's growth to students nationally in the same grade who started in the same approximate RIT range on the test. Assume, for example, that Marco is a 5th grader this spring. He achieved a RIT score of 225 on his most recent NWEA math test. The previous spring, Marco scored 210 as a 4th grader. Because NWEA measures math achievement on a single cross-grade equal interval scale, we can say that Marco grew 15 points during the past year. But is 15 points of growth good? Substandard? Clearly some basis for comparison is needed.

According to the most recent norms study, 4th graders who started in the 210-220 range in mathematics, like Marco, grew about 8 points (actually 8.5 points rounded) from spring to spring. We call this number the *RIT range growth norm* for Marco. Marco grew 15 points. We calculate his *growth index* score by subtracting the RIT range growth norm from his actual growth (15-8). This makes Marco's *growth index* score a +7. This statistic tells us that Marco did quite well when we compare his growth to a group of similarly performing peers. If another student in this class, say Jake, started with the same score of 210 and improved to only 215, his growth index score would be calculated by subtracting the 8 point growth of the norm group from his growth, 5 points. This gives Jake a *growth index* score of -3, indicating that Jake's growth was slightly lower than a group of peers.

The *growth index* score is a useful statistic for evaluating the progress of students and growth produced by schools. First, the use of a growth statistic by itself provides a direct assessment of academic progress, and progress is the primary academic variable that educators attempt to influence. In addition, the use of growth measures diminishes the effect that factors external to schools, such as socio-economic factors, typically introduce into the assessment of student performance on achievement tests. Finally, use of the growth index controls for starting achievement on the RIT scale. Introducing this control is quite reasonable. If we were trying to assess the effectiveness of weight loss programs

for example, we would not evaluate the effectiveness of the program for a person who is more than 100 pounds overweight by comparing his or her weight loss to a population that averaged only 10 pounds overweight. We would want to compare this individual's progress to a control group of obese people. Similarly, if we are judging the progress of students, we should compare the progress of high performers to other high performers and low performers to others students of similar standing. This improves the fairness of comparisons and provides a reasonable estimate of the "value-added" that a school program might provide.

Since the publication of the RIT range norms in 2000, many NWEA clients have begun using some variant of the growth index concept as a tool to assess the growth produced by schools and programs. The growth index statistic, however, lacked any basis for formulating comparisons that would allow users to draw sound judgments from their data. For example, if the 4th graders at Shady Elm elementary produced an average growth index score of +3, we had no way to determine just how strong their performance was without some knowledge of the growth index scores produced by other schools. In an effort to identify some parameters for this statistic we conducted a study of growth index scores produced by schools that participated in the 2002 norming study.

Methodology

Fall-to-spring and spring-to-spring growth index averages in reading, language usage, and mathematics were generated for all schools participating in the 2002 norms study. For grades 3 through 6, a school's average was included for any grade in which 15 students had growth data. For grades 7 through 11 a school's growth average was included for any grade in which 30 students had growth data.

To calculate the averages, individual growth index statistics were calculated for all students who had valid test scores for both seasons covered by the study. Student scores were screened using the same minimum score, maximum score, and standard error criteria that NWEA normally uses to assess the validity of a test score. Scores that did not survive these screening criteria were removed. In addition, records with absolute growth scores greater than 40 were removed because an extremely large gain or loss indicated a high likelihood that one of the two test scores did not accurately estimate the student's real achievement. Application of this rule also helped assure that the growth index score was not overly influenced by a single student's performance.

School-wide averages were calculated by grade using the growth index scores of students whose results survived application of the criteria. These averages were

used to calculate univariate summaries of the school growth index averages and place them within percentile tables.

Some schools prefer to generate counts of the proportion of students who were successful at meeting or exceeding their growth index target. Based on data from the norms study, we also calculated the proportion of students in each participating grade within each school who were successful at meeting or exceeding their growth index target. These results were also placed within percentile tables.

We found a slight to moderate positive skew in the reading and mathematics results for most grades. We also found a moderate negative skew for two grades in language usage.

When schools evaluate their results against that achieved by other schools they should be aware that a growth index score of 0.0 does not always represent the mid-point of a distribution.

Interpreting the Results

Tables 1 through 12 (pp. 7-12) display the results of the study. Schools typically use growth index results for two purposes:

1. To identify whether a school program is producing value-added results for students on the NWEA measure.
2. To establish numerical targets for school or program improvement.

Evaluating whether a school program produces value-added results

Let's assume we are evaluating a seventh grade reading program at Logan Middle School. Their program produced a spring to spring growth index score of +1.5 this past year and 64% of their students were successful in achieving growth equal to or exceeding their RIT range growth norm. Did this program produce value-added results? Is it likely to do so next year?

According to Table 1, Logan's growth index score exceeded that of more than 90% to 95% of the schools participating in the norm study. The proportion of students who met or exceeded their growth norm, 64%, also exceeded that of 90% to 95% of the schools in the norm study. Both statistics are more than 1 standard deviation beyond the mean scores for this grade. You could fairly say that this school did produce value-added results. In fact, their performance is good enough that they are very likely to produce above average results again next year if the program and staff do not substantively change.

Now assume that a second school, Mellon Elementary, produced a growth index score of -1.8 and that only 36% of their students were successful in achieving their RIT range growth norm. Would that result be cause for concern? Mellon's growth index scores are below those of 70% of the schools participating in the norm study. Although this is low, it is less than one standard deviation from the median school in the group. You can fairly say that while this school produced negative value-added results, the results are not so low to conclusive label Mellon as underperforming. On the other hand, the proportion of students who met their growth norm, 30%, is lower than 90% of schools and is more than a standard deviation below the mean. This would raise my level of concern. It seems like a good idea for the school to work to improve this program, without assuming that a wholesale overhaul is required based on this year's data alone.

Table 1 – Example of spring to spring school growth index results for reading

Grade 6-7 Percentile	Growth Index	Proportion meeting RIT Range Growth Norm
1	-4.6	26.2%
5	-3.3	33.5%
10	-2.6	36.3%
20	-1.8	42.0%
30	-1.3	44.8%
40	-1.0	47.2%
50	-0.7	50.0%
60	-0.2	51.9%
70	0.1	55.3%
80	0.6	58.9%
90	1.5	63.7%
95	2.0	66.4%
99	3.1	75.0%
Summary		
Count	288	288
Mean	-0.6	50.1%
Standard Deviation	1.6	10.3%
Legend		
Logan		
Mellon		

Establishing targets for school improvement

What might be a reasonable improvement target for a school like Mellon Elementary? A good target should be achievable if teachers apply strong effort toward improvements that are well designed and research-based. The target should be difficult to achieve purely by accident. The percentile tables help educators judge the reasonability of a target by providing data about what other schools have successfully achieved.

Let's say Mellon tries for a ½ point improvement, this would move their average from a growth index of -1.8 to an index of -1.3. 70% of schools already meet or exceed this growth index score. The anticipated improvement is less than one standard deviation, and would move Mellon's performance past only 10% of the schools in the norm study. This target doesn't seem adequately ambitious. If achieved, it would not represent a large improvement in performance and this improvement could well happen by chance.

A 3 point improvement would clearly be more ambitious. It would put Mellon's growth index statistic beyond 95% of the schools that participated in the norm study. But this level of performance, while it is achieved by a small proportion of schools, may seem like more than a school can achieve in a single year (although this is entirely a matter of judgment). The target would require improvement of nearly two standard deviations. My personal instinct would be to say that this target is too ambitious.

An improvement of 1 to 2 points seems more reasonable. An improvement of 1 point would move Mellon to the upper half of schools and would represent about 2/3 of a standard deviation change. A 2 point improvement would move Mellon to the upper 30% of schools and would be about a 1 1/3 standard deviation change. These are not likely to be achieved without effort, but they seem achievable if the staff acts strongly and purposefully. How far Mellon's staff wishes to stretch, however, should be their choice after informed deliberation.

One would apply the same principles when using the statistics showing proportions of students meeting or exceeding our RIT range growth norms. In both cases, a good target should be within the realm of the possible (at least somewhere inside the table, probably between the 10th and 90th percentile), it should require more improvement than would normally be achieved by random variance, and it should require strong, purposeful action on the part of the faculty to achieve.

Discussion

The primary purpose of the study was to offer some interpretation parameters to schools using the growth index statistic. The accompanying tables should be helpful to schools that use growth index information to evaluate programs and establish targets for improvement.

The data also tell us something about the differences between high and low growth programs. Students in the lowest ten percent of schools in a grade lose as much as 30% to 40% of a year of growth relative to the average school. Relative to the highest 10% of schools that figure may rise to as much as 50% to 60% of a year's growth. The data show that children in low growth environments fall substantively farther behind children in average schools each year. Conversely, students in high growth programs, gain about 20% to 30% of a year's growth in relation to average schools at many grades.

We should keep in mind however, that even in the best schools, many children do not succeed in achieving their growth index target. As a general rule, 30% to

40% of the students in low growth schools reach the RIT range growth norms while 60 to 70% of students reach the norm in high growth schools. When setting targets using this statistic, educators should remember that a school in which more than 70% of the students meet or exceed their growth index norm is extraordinary.

Above all else, the study reinforces the need for schools to have growth data that provides substantive basis for comparisons when making decisions about effectiveness and setting targets for improvement. Schools have not typically had access to this kind of information. This means that schools normally set improvement targets without empirical data to guide the decision. The resulting targets are often shots in the dark, sometimes so easy as to be achieved without effort, at other times so difficult that they guarantee failure. Empirical data can improve this process and the quality of school improvement targets..

We hope that reviewing the evidence of what NWEA schools have achieved relative to value-added growth will help districts make more informed and reliable judgments about the effectiveness of their schools and set more refined targets for improvement.

Table 1- Fall to spring school program growth index averages - reading

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	-8.8	-7.8	-6.2	-5.5	-4.5	-4.2	-5.6	-3.7	-4.1
5	-7.1	-5.6	-4.3	-3.7	-2.9	-3.0	-2.8	-3.3	-3.8
10	-6.6	-4.2	-3.3	-3.0	-2.2	-2.2	-2.3	-3.0	-3.6
20	-4.2	-2.4	-2.1	-2.1	-1.4	-1.6	-1.7	-1.8	-2.0
30	-1.9	-1.6	-1.4	-1.4	-0.9	-1.2	-1.4	-1.5	-1.4
40	-0.9	-0.8	-0.8	-0.9	-0.5	-0.9	-1.0	-1.1	-0.8
50	-0.2	-0.2	-0.2	-0.5	-0.1	-0.6	-0.6	-0.8	-0.5
60	0.7	0.6	0.2	0.1	0.3	-0.2	0.0	-0.4	-0.4
70	1.0	1.4	0.7	0.5	0.9	0.1	0.4	0.0	-0.2
80	1.7	2.2	1.3	1.1	1.4	0.5	0.7	0.4	0.2
90	2.9	3.3	2.1	1.9	2.2	1.2	1.9	1.1	1.5
95	3.5	4.5	2.9	2.8	2.8	1.5	2.4	1.7	2.2
99	4.8	7.6	4.6	4.5	4.9	3.0	3.5	2.8	2.9
Summary Information									
Count	75	864	900	873	559	273	251	81	31
Mean	-0.9	-0.2	-0.4	-0.5	0.0	-0.6	-0.5	-0.8	-0.8
SD	3.5	3.0	2.2	2.0	1.9	1.4	1.7	1.5	1.8

Table 2 - Spring to spring school growth index averages - reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-6.7	-6.3	-5.1	-4.6	-4.6	-5.0	-5.9	-5.9
5	-4.8	-4.3	-3.4	-3.0	-3.3	-3.0	-2.8	-3.8
10	-3.8	-3.1	-2.5	-2.4	-2.6	-2.1	-2.1	-2.1
20	-2.8	-2.2	-1.7	-1.6	-1.8	-1.6	-1.3	-1.7
30	-1.8	-1.5	-0.9	-1.0	-1.3	-1.2	-1.1	-1.2
40	-0.9	-0.9	-0.4	-0.4	-1.0	-0.8	-0.5	-0.9
50	-0.2	-0.4	0.0	0.0	-0.7	-0.5	-0.2	-0.8
60	0.5	0.2	0.3	0.5	-0.2	-0.2	0.0	-0.6
70	1.0	0.6	0.8	0.9	0.1	0.2	0.3	-0.5
80	1.7	1.2	1.3	1.4	0.6	0.6	0.7	-0.2
90	2.5	1.9	2.1	2.0	1.5	1.4	1.3	0.6
95	3.2	2.6	2.7	2.7	2.0	2.7	2.3	1.3
99	4.9	3.6	3.8	4.4	3.1	3.7	3.9	3.8
Summary Information								
Count	345	842	820	523	288	228	76	22
Mean	-0.5	-0.5	-0.2	-0.1	-0.6	-0.5	-0.3	-0.9
SD	2.6	2.1	1.9	1.8	1.6	1.7	1.9	2.0

Table 3 – Fall to spring percentage of students meeting or exceeding their RIT range growth norm by school - reading

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	7.5%	13.6%	17.9%	20.0%	24.7%	27.8%	23.0%	28.1%	26.9%
5	19.6%	23.5%	28.6%	28.6%	35.0%	33.8%	31.6%	33.4%	31.3%
10	24.4%	29.5%	33.3%	34.0%	39.0%	38.9%	36.8%	35.6%	35.2%
20	34.3%	38.3%	38.9%	39.6%	44.0%	42.1%	41.3%	39.7%	43.2%
30	42.3%	44.4%	44.4%	44.1%	47.5%	45.4%	45.0%	43.4%	45.1%
40	50.0%	48.1%	48.1%	47.8%	50.3%	48.1%	48.1%	46.3%	48.0%
50	53.0%	51.9%	51.7%	50.6%	52.9%	49.8%	50.7%	48.3%	50.0%
60	56.1%	57.3%	55.0%	53.3%	56.3%	51.7%	53.6%	50.7%	52.1%
70	59.7%	61.5%	58.7%	57.6%	60.0%	54.2%	56.4%	53.5%	54.9%
80	65.2%	66.7%	62.5%	61.1%	63.8%	57.3%	60.1%	57.2%	56.8%
90	69.4%	72.4%	68.4%	66.7%	68.9%	60.9%	64.2%	61.9%	59.6%
95	72.6%	78.3%	72.7%	71.7%	73.3%	64.8%	68.5%	64.9%	65.9%
99	76.3%	88.1%	80.8%	81.5%	87.6%	68.9%	73.6%	69.8%	70.9%
Summary Information									
Count	75	866	900	877	560	274	252	82	32
Mean	49.7%	52.0%	51.1%	50.7%	53.8%	49.7%	50.4%	48.7%	49.5%
SD	17.3%	16.6%	13.7%	13.0%	12.1%	9.0%	11.1%	9.9%	10.3%

Table 4 – Spring to spring percentage of students meeting or exceeding their RIT range growth norm by school - reading

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	18.3%	18.3%	27.1%	26.9%	26.2%	0.0%	25.4%	33.0%
5	26.3%	30.5%	34.0%	34.1%	33.5%	33.3%	35.1%	34.3%
10	31.7%	35.1%	37.5%	38.5%	36.3%	32.0%	40.0%	40.4%
20	38.7%	40.9%	43.1%	43.5%	42.0%	40.0%	45.3%	42.0%
30	43.3%	45.0%	47.9%	47.9%	44.8%	45.9%	48.6%	45.4%
40	48.3%	48.4%	51.5%	50.6%	47.2%	48.2%	50.5%	46.2%
50	51.4%	51.5%	53.9%	53.6%	50.0%	50.0%	51.6%	48.7%
60	55.2%	54.4%	56.4%	56.6%	51.9%	53.0%	54.5%	50.3%
70	59.1%	57.6%	59.3%	60.2%	55.3%	56.1%	56.8%	51.6%
80	62.6%	61.0%	63.2%	63.6%	58.9%	60.6%	58.7%	55.0%
90	67.8%	66.2%	68.3%	68.7%	63.7%	72.1%	64.5%	57.1%
95	72.5%	71.2%	72.6%	72.8%	66.4%	82.5%	65.3%	57.7%
99	80.5%	77.8%	79.4%	78.3%	75.0%	100.0%	70.7%	74.3%
Summary Information								
Count	345	842	820	523	288	328	76	22
Mean	50.7%	50.9%	53.4%	53.6%	50.1%	50.7%	52.0%	48.9%
SD	14.1%	12.5%	11.7%	11.8%	10.3%	18.8%	9.7%	9.4%

Table 5- Fall to spring school program growth index averages – language usage

Percentile Table								
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
1	-4.4	-7.6	-6.7	-5.4	-5.7	-3.9	-2.5	-3.9
5	-2.6	-4.2	-4.4	-3.4	-3.2	-2.9	-2.2	-2.8
10	-1.2	-3.2	-3.3	-2.1	-2.3	-2.4	-1.8	-1.7
20	-0.5	-1.7	-2.1	-1.3	-1.3	-1.7	-1.4	-1.4
30	0.3	-0.3	-1.4	-0.7	-0.9	-1.3	-1.0	-0.8
40	1.0	0.7	-0.8	-0.2	-0.4	-0.9	-0.6	-0.6
50	1.4	1.3	-0.3	0.4	0.1	-0.5	-0.3	-0.3
60	1.6	2.0	0.2	0.8	0.3	-0.2	-0.1	0.0
70	2.2	2.6	0.7	1.1	0.8	0.1	0.4	0.1
80	3.4	3.2	1.1	1.7	1.4	0.6	0.8	0.7
90	4.4	4.0	1.8	2.5	2.2	1.2	1.3	1.2
95	5.1	5.0	2.3	3.0	2.7	1.7	1.9	1.4
99	5.5	6.5	3.7	4.1	4.4	3.3	3.1	2.1
Summary Information								
Count	13	452	508	435	291	146	50	28
Mean	1.3	0.9	-0.6	0.2	-0.1	-0.6	-0.2	-0.4
SD	2.7	2.9	2.1	1.9	1.9	1.5	1.3	1.4

Table 6 - Spring to spring school growth index averages – language usage

Percentile Table							
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9
1	-5.9	-3.8	-6.0	-5.1	-3.1	-4.9	-3.8
5	-3.6	-1.9	-3.2	-3.3	-1.8	-3.4	-2.7
10	-2.6	-1.2	-2.1	-2.2	-1.4	-2.5	-2.3
20	-1.6	-0.3	-1.3	-1.5	-0.8	-1.5	-1.9
30	-0.7	0.3	-0.7	-0.9	-0.4	-1.3	-1.5
40	-0.2	0.8	-0.1	-0.5	0.0	-0.9	-1.4
50	0.4	1.2	0.2	0.0	0.3	-0.3	-1.1
60	0.9	1.6	0.7	0.3	0.6	0.0	-0.9
70	1.5	2.2	1.0	0.7	1.0	0.3	-0.7
80	2.3	2.7	1.5	1.0	1.3	0.6	-0.2
90	3.2	3.4	2.2	1.6	1.8	1.1	0.3
95	3.8	4.0	2.7	2.2	2.2	1.5	0.6
99	5.3	5.2	4.2	4.0	2.9	2.0	0.8
Summary Information							
Count	481	502	329	165	154	57	17
Mean	0.3	1.1	0.1	-0.2	0.2	-0.6	-1.1
SD	2.3	1.9	1.9	1.7	1.3	1.6	1.2

Table 7 – Fall to spring percentage of students meeting or exceeding their RIT range growth norm by school – language usage

Percentile Table							
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
1	12.5%	11.6%	18.5%	18.8%	25.0%	33.0%	27.2%
5	25.0%	23.2%	29.7%	27.4%	33.3%	38.3%	30.5%
10	33.2%	27.8%	38.0%	34.1%	35.6%	41.5%	35.3%
20	43.8%	35.1%	43.8%	39.4%	41.6%	43.5%	42.0%
30	50.0%	41.2%	47.7%	45.1%	44.6%	46.4%	45.3%
40	56.1%	45.3%	52.0%	48.8%	46.6%	48.8%	47.9%
50	60.4%	48.7%	55.2%	51.3%	48.9%	51.1%	48.5%
60	64.2%	52.4%	58.8%	53.7%	51.2%	52.4%	50.8%
70	67.9%	55.6%	62.0%	56.1%	55.3%	55.2%	54.1%
80	71.4%	59.3%	66.7%	60.7%	58.9%	59.1%	58.9%
90	76.7%	64.0%	71.1%	66.7%	62.5%	63.9%	61.9%
95	82.3%	67.9%	73.7%	72.0%	66.0%	70.0%	62.3%
99	87.5%	73.7%	81.7%	78.0%	71.1%	73.1%	67.4%
Summary Information							
Count	447	506	435	289	146	50	28
Mean	57.4%	47.4%	54.5%	50.5%	49.5%	51.8%	49.0%
SD	16.9%	13.9%	13.5%	13.0%	10.4%	9.5%	10.5%

Table 8 – Spring to spring percentage of students meeting or exceeding their RIT range growth norm by school – language usage

Percentile Table							
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9
1	22.5%	31.6%	31.6%	25.7%	33.8%	32.0%	28.4%
5	34.1%	41.7%	41.7%	33.7%	41.4%	34.8%	35.6%
10	38.4%	46.0%	46.1%	40.4%	44.6%	39.6%	39.9%
20	45.0%	51.5%	51.7%	45.7%	47.9%	43.3%	42.4%
30	48.4%	55.6%	55.6%	48.4%	52.3%	47.2%	43.4%
40	51.9%	58.3%	58.4%	50.6%	54.7%	49.1%	44.7%
50	55.2%	61.7%	61.8%	54.0%	57.2%	51.4%	47.5%
60	58.1%	63.8%	63.8%	56.5%	59.4%	53.2%	48.0%
70	61.1%	67.4%	67.4%	59.2%	61.6%	55.7%	51.0%
80	65.1%	70.7%	70.7%	62.1%	63.6%	58.8%	52.5%
90	70.2%	74.7%	74.7%	65.8%	67.3%	62.2%	55.3%
95	74.3%	78.3%	78.3%	67.5%	70.1%	63.3%	56.7%
99	79.0%	83.3%	83.3%	76.3%	73.5%	69.2%	57.3%
Summary Information							
Count	481	502	498	166	155	58	18
Mean	54.6%	60.8%	60.9%	53.3%	56.2%	51.0%	46.6%
SD	12.4%	11.2%	11.2%	10.6%	8.9%	9.0%	7.5%

Table 9 - Fall to spring school program growth index averages - mathematics

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	-8.1	-8.1	-6.0	-5.6	-5.9	-4.1	-5.8	-7.4	-3.0
5	-5.7	-5.8	-4.2	-4.0	-4.0	-3.1	-3.9	-4.3	-2.5
10	-5.1	-4.6	-3.3	-3.2	-3.0	-2.5	-3.1	-3.3	-2.2
20	-4.2	-2.8	-2.3	-2.3	-1.9	-1.7	-2.3	-2.1	-2.0
30	-2.0	-2.0	-1.6	-1.5	-1.2	-1.3	-1.5	-1.4	-1.3
40	-0.8	-1.2	-1.0	-0.8	-0.7	-0.6	-1.2	-1.1	-0.7
50	-0.1	-0.4	-0.3	-0.3	-0.1	-0.1	-0.6	-0.4	-0.4
60	0.8	0.3	0.4	0.5	0.5	0.3	-0.1	0.0	0.3
70	1.4	1.0	1.1	1.0	1.0	0.9	0.5	0.5	0.8
80	2.1	2.0	1.9	1.7	1.6	1.6	1.3	1.2	1.3
90	3.4	3.2	2.9	2.7	2.6	2.3	2.8	5.8	1.9
95	4.9	4.3	3.8	3.8	3.7	3.4	4.1	8.4	4.0
99	5.5	6.5	5.4	6.0	7.3	4.7	6.5	11.3	5.7
Summary Information									
Count	80	835	903	878	567	277	288	76	30
Mean	-0.5	-0.5	-0.2	-0.2	-0.1	-0.1	-0.4	0.2	0.0
SD	3.4	3.0	2.5	2.4	2.5	2.0	2.5	3.9	2.1

Table 10 - Spring to spring school growth index averages - mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	-8.6	-6.3	-6.0	-6.9	-5.1	-6.2	-12.0	-6.3
5	-7.3	-4.7	-3.9	-4.6	-3.7	-4.1	-7.6	-5.1
10	-5.9	-3.6	-3.1	-3.9	-2.8	-3.2	-6.0	-4.4
20	-3.9	-2.5	-2.0	-2.3	-1.7	-2.2	-4.2	-3.7
30	-2.0	-1.7	-1.3	-1.5	-1.2	-1.5	-3.2	-2.5
40	-0.8	-1.0	-0.8	-0.7	-0.6	-1.0	-2.1	-1.3
50	-0.1	-0.2	-0.2	0.1	-0.1	-0.3	-0.6	-0.8
60	0.6	0.5	0.3	0.9	0.4	0.2	0.1	-0.5
70	1.4	1.2	0.9	1.5	1.0	0.9	1.0	0.5
80	2.2	2.0	1.6	2.3	1.8	1.7	2.9	2.7
90	3.4	3.2	2.5	3.5	2.5	3.5	5.4	4.1
95	4.7	4.7	3.4	4.7	3.6	4.3	8.9	6.3
99	8.0	6.6	5.1	7.1	5.1	6.2	10.0	9.8
Summary Information								
Count	354	836	817	526	290	228	104	54
Mean	-0.6	-0.2	-0.2	0.0	-0.1	-0.2	-0.6	-0.4
SD	3.6	2.8	2.3	2.9	2.2	2.6	4.7	3.7

Table 11 – Fall to spring percentage of students meeting or exceeding their RIT range growth norm by school - mathematics

Percentile Table									
	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1	12.1%	9.1%	12.9%	15.5%	17.0%	28.8%	21.2%	21.5%	36.4%
5	16.2%	18.5%	25.0%	24.9%	26.9%	33.9%	28.0%	28.6%	36.7%
10	26.4%	25.2%	30.1%	29.3%	33.3%	36.6%	33.0%	32.3%	39.4%
20	31.3%	33.8%	36.7%	36.7%	40.5%	41.4%	38.8%	38.0%	42.1%
30	43.1%	40.3%	42.9%	41.9%	44.4%	45.1%	41.8%	42.4%	44.7%
40	49.5%	44.9%	46.9%	47.0%	48.4%	48.2%	44.7%	45.0%	46.2%
50	53.9%	50.0%	51.0%	51.3%	52.5%	53.0%	47.7%	48.5%	50.4%
60	59.2%	55.7%	56.0%	55.7%	56.2%	55.9%	51.6%	51.5%	53.9%
70	62.8%	60.6%	60.6%	60.0%	59.8%	59.4%	55.4%	56.2%	57.4%
80	65.2%	66.7%	66.2%	65.1%	64.5%	63.2%	58.9%	61.3%	61.4%
90	72.0%	73.7%	72.7%	71.5%	71.9%	69.3%	66.2%	76.5%	67.0%
95	75.6%	79.5%	77.4%	78.1%	75.8%	74.8%	70.7%	83.6%	74.2%
99	80.6%	89.5%	84.1%	86.8%	88.4%	81.3%	83.9%	85.8%	79.9%
Summary Information									
Count	79	833	902	877	566	276	257	75	29
Mean	50.7%	49.9%	51.3%	51.0%	52.2%	52.6%	48.9%	50.8%	52.3%
SD	18.5%	18.4%	16.3%	16.3%	14.9%	12.6%	13.1%	16.0%	12.0%

Table 12 – Spring to spring percentage of students meeting or exceeding their RIT range growth norm by school – mathematics

Percentile Table								
	Grade 2-3	Grade 3-4	Grade 4-5	Grade 5-6	Grade 6-7	Grade 7-8	Grade 8-9	Grade 9-10
1	11.9%	14.1%	16.9%	17.0%	26.1%	22.1%	8.1%	21.0%
5	17.4%	25.0%	28.5%	23.1%	30.1%	30.0%	14.2%	22.8%
10	23.8%	31.0%	33.3%	30.3%	34.0%	34.3%	21.0%	25.0%
20	33.3%	37.7%	40.5%	38.4%	41.4%	37.8%	27.8%	31.5%
30	41.0%	42.9%	44.4%	44.3%	45.1%	41.6%	32.6%	37.9%
40	48.2%	47.5%	47.9%	50.0%	49.5%	45.5%	42.4%	44.7%
50	52.5%	51.7%	51.7%	54.3%	52.3%	50.1%	47.6%	48.0%
60	57.5%	56.7%	55.3%	58.8%	56.0%	54.0%	53.3%	50.9%
70	61.4%	60.7%	59.1%	62.4%	59.4%	57.4%	59.8%	53.3%
80	66.0%	66.1%	64.3%	67.5%	63.2%	60.8%	65.4%	67.4%
90	72.6%	72.2%	69.7%	75.0%	67.9%	66.2%	77.1%	71.4%
95	79.4%	77.6%	75.0%	79.6%	72.6%	71.9%	80.9%	76.8%
99	91.3%	86.4%	83.7%	93.4%	80.3%	81.2%	82.4%	89.8%
Summary Information								
Count	353	835	816	525	289	227	103	53
Mean	50.5%	51.7%	51.7%	53.3%	52.2%	50.0%	47.1%	48.3%
SD	18.6%	16.0%	14.3%	17.2%	12.9%	13.0%	20.6%	17.7%