

Linking Study Report: Predicting Performance on the New York State Testing Program (NYSTP) based on NWEA MAP Growth Scores

July 2020

NWEA Psychometric Solutions

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Executive Summary

To predict student achievement on the New York State Testing Program (NYSTP) in Grades 3–8 English Language Arts (ELA) and Mathematics, NWEA® conducted a linking study using Spring 2018 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the NYSTP performance levels. With this information, educators can identify students at risk of failing to meet state proficiency standards early in the year and provide tailored educational interventions. The linking study has been updated since the previous version published in January 2020 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020).

Table E.1 presents the *Level III* performance level cut scores and the corresponding MAP Growth RIT cut scores that allow teachers to identify students who are on track for proficiency on the state summative test and those who are not. For example, the *Level III* cut score on the NYSTP Grade 3 ELA test is 602. A Grade 3 student with a MAP Growth Reading RIT score of 191 in the fall is likely to meet proficiency on the NYSTP ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 191 in the fall is in jeopardy of not meeting proficiency. MAP Growth cut scores for Grade 2 are also provided so educators can track early learners’ progress toward proficiency on the NYSTP test by Grade 3. These cut scores were derived based on the Grade 3 cuts and the 2020 NWEA growth norms for the adjacent grade (i.e., Grades 2 to 3).

Table E.1. MAP Growth Cut Scores for NYSTP Proficiency

Assessment		Level III Cut Scores by Grade						
		2	3	4	5	6	7	8
ELA/Reading								
NYSTP Spring		–	602	603	609	602	607	603
MAP Growth	Fall	177	191	201	212	214	222	223
	Winter	186	198	207	216	218	224	225
	Spring	190	201	209	218	219	225	226
Mathematics								
NYSTP Spring		–	600	602	604	604	606	610
MAP Growth	Fall	176	189	203	216	219	227	236
	Winter	185	197	210	222	224	231	239
	Spring	190	202	214	226	227	234	241

Please note that the results in this report may differ from those found in the NWEA reporting system for individual districts. The typical growth scores from fall to spring or winter to spring used in this report are based on the default instructional weeks most commonly encountered for each term (i.e., Weeks 4, 20, and 32 for fall, winter, and spring, respectively). However, instructional weeks often vary by district, so the cut scores in this report may differ slightly from the MAP Growth score reports that reflect spring instructional weeks set by partners.

E.1. Assessment Overview

The NYSTP Grades 3–8 ELA and Mathematics tests are New York State’s operational summative assessments aligned to the New York State Learning Standards. Based on their test scores, students are placed into one of four performance levels: *Level I*, *Level II*, *Level III*, and *Level IV*. These NYSTP tests are used to measure the extent to which individual students achieve the New York State Learning Standards in ELA and Mathematics to determine whether schools, districts, and the state meet the required progress objectives specified in the New York State accountability system. The *Level III* cut score demarks the minimum level of achievement considered to be proficient. MAP Growth tests are adaptive interim assessments aligned to state-specific content standards and administered in the fall, winter, and spring. Scores are reported on the RIT vertical scale with a range of 100–350.

E.2. Linking Methods

Based on scores from the Spring 2018 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring NYSTP performance level cut scores. Spring cuts for Grade 2 were derived based on the cuts for Grade 3 and the 2020 NWEA growth norms. MAP Growth fall and winter cut scores that predict proficiency on the spring NYSTP test were then projected using the 2020 NWEA growth norms that provide expected score gains across test administrations.

E.3. Student Sample

Only students who took both the MAP Growth and NYSTP assessments in Spring 2018 were included in the study sample. Table E.2 presents the weighted number of New York students from 23 districts and 214 schools who were included in the linking study sample. The linking study sample is voluntary and can only include student scores from partners who share their data. Also, not all students in a state take MAP Growth. The sample may therefore not represent the general student population as well as it should. To ensure that the linking study sample represents the state student population in terms of race, sex, and performance level, weighting (i.e., a statistical method that matches the distributions of the variables of interest to those of the target population) was applied to the sample. As a result, the RIT cuts derived from the study sample can be generalized to any student from the target population. All analyses in this study for Grades 3–8 were conducted based on the weighted sample.

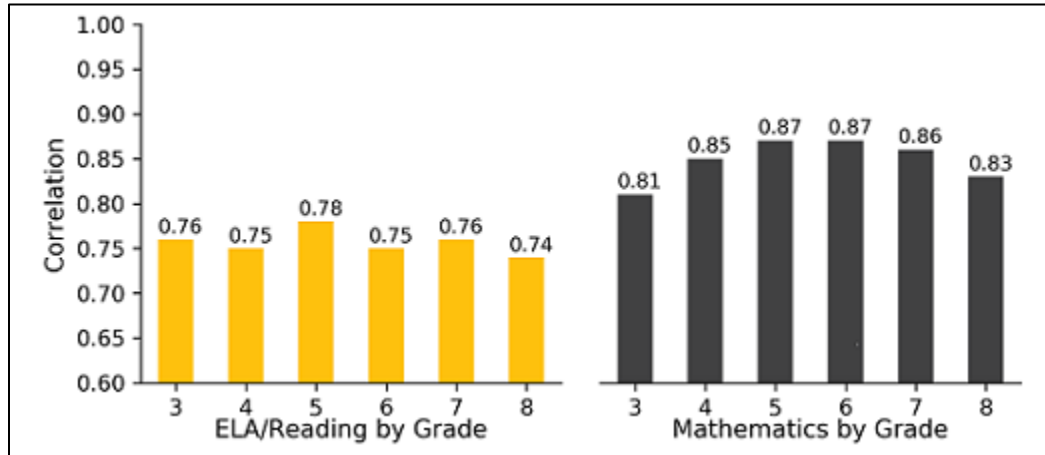
Table E.2. Linking Study Sample

Grade	#Students	
	ELA/Reading	Mathematics
3	6,328	6,474
4	6,477	6,565
5	6,202	6,364
6	6,075	6,275
7	5,486	5,418
8	5,187	4,449

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and NYSTP scores range from 0.74 to 0.87 across both content areas, as shown in Figure E.1. These values indicate a strong relationship among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on the NYSTP assessments.

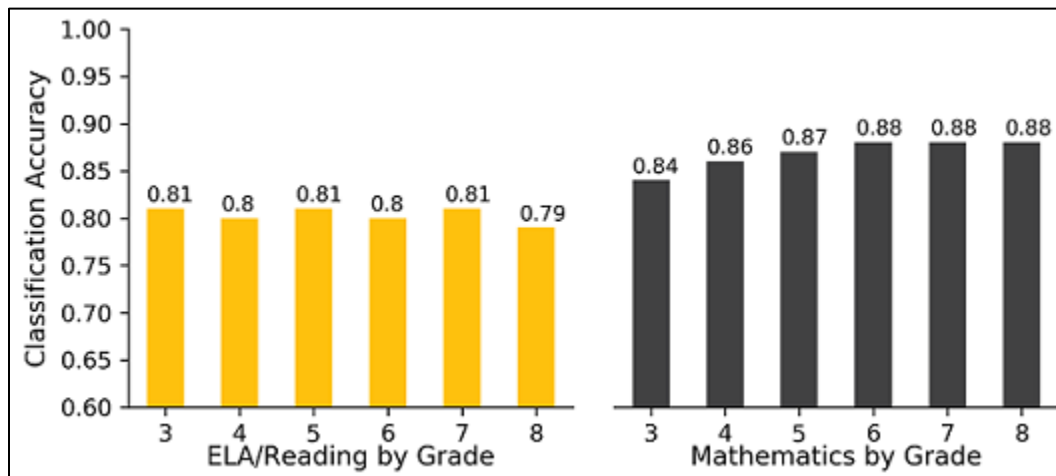
Figure E.1. Correlations between MAP Growth and NYSTP



E.5. Accuracy of MAP Growth Classifications

Figure E.2 presents the classification accuracy statistics that show the proportion of students correctly classified by their RIT scores as proficient or not proficient on the NYSTP tests. For example, the MAP Growth Reading Grade 3 *Level III* cut score has a 0.81 accuracy rate, meaning it accurately classified student achievement on the state test for 81% of the sample. The results range from 0.79 to 0.88 across both content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the NYSTP tests.

Figure E.2. Accuracy of MAP Growth Classifications



1. Introduction

1.1. Purpose of the Study

NWEA® is committed to providing partners with useful tools to help make inferences about student learning from MAP® Growth™ test scores. One important use of MAP Growth results is to predict a student's performance on the state summative assessment at different times throughout the year. This allows educators and parents to determine if a student is on track in their learning to meet state standards by the end of the year or, given a student's learning profile, is on track to obtain rigorous, realistic growth in their content knowledge and skills.

This document presents results from a linking study conducted by NWEA in July 2020 to statistically connect the scores of the New York State Testing Program (NYSTP) in Grades 3–8 English Language Arts (ELA) and Mathematics with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2018 term. The linking study has been updated since the previous version published in January 2020 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020). In this updated study, MAP Growth cut scores are also included for Grade 2 so educators can track early learners' progress toward proficiency on the NYSTP test by Grade 3. This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth RIT cut scores that correspond to the NYSTP performance levels using the equipercentile linking procedure for the spring results and the 2020 norms for the fall and winter results
4. Classification accuracy statistics to determine the degree to which MAP Growth accurately predicts student proficiency status on the NYSTP tests
5. The probability of achieving grade-level proficiency on the NYSTP assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The NYSTP Grades 3–8 ELA and Mathematics tests are New York State's operational summative assessments aligned to the New York State Learning Standards. Each assessment has three cut scores (i.e., the minimum score a student must get on a test to be placed in a certain performance level) that distinguish between the following performance levels: *Level I*, *Level II*, *Level III*, and *Level IV*. The *Level III* cut score demarks the minimum level of performance considered to be proficient for accountability purposes.

MAP Growth interim assessments from NWEA are computer adaptive and aligned to state-specific content standards. Scores are reported on the RIT vertical scale with a range of 100–350. Each content area has its own scale. To aid the interpretation of scores, NWEA periodically conducts norming studies of student and school performance on MAP Growth. Achievement status norms show how well a student performed on the MAP Growth test compared to students in the norming group by associating the student's performance on the MAP Growth test, expressed as a RIT score, with a percentile ranking. Growth norms provide expected score gains across test administrations (e.g., the relative evaluation of a student's growth from fall to spring). The most recent norms study was conducted in 2020 (Thum & Kuhfeld, 2020).

2. Methods

2.1. Data Collection

This linking study is based on data from the Spring 2018 administrations of the MAP Growth and NYSTP assessments. NWEA recruited New York districts to participate in the study by sharing their student and score data for the target term. Districts also gave NWEA permission to access students' associated MAP Growth scores from the NWEA in-house database. Once New York state score information was received by NWEA, each student's state testing record was matched to their MAP Growth score by using the student's first and last names, date of birth, student ID, and other available identifying information. Only students who took both the MAP Growth and NYSTP assessments in Spring 2018 were included in the study sample.

2.2. Post-Stratification Weighting

Post-stratification weights were applied to the calculations to ensure that the linking study sample represented the state population in terms of race, sex, and performance level. These variables were selected because they are correlated with the student's academic achievement within this study and are often provided in the data for the state population. The weighted sample matches the target population as closely as possible on the key demographics and test score characteristics. Specifically, a raking procedure was used to calculate the post-stratification weights and improve the representativeness of the sample. Raking uses iterative procedures to obtain weights that match sample marginal distributions to known population margins. The following steps were taken during this process:

- Calculate marginal distributions of race, sex, and performance level for the sample and population.
- Calculate post-stratification weights with the rake function from the survey package in R (Lumley, 2019).
- Trim the weight if it is not in the range of 0.3 to 3.0.
- Apply the weights to the sample before conducting the linking study analyses.

2.3. MAP Growth Cut Scores

The equipercntile linking method (Kolen & Brennan, 2004) was used to identify the spring MAP Growth RIT scores that correspond to the spring NYSTP performance level cut scores. Spring cuts for Grade 2 were derived based on the cuts for Grade 3 and the 2020 NWEA growth norms. RIT fall and winter cut scores that predict proficiency on the spring NYSTP test were then projected using the 2020 growth norms. Percentile ranks are also provided that show how a nationally representative sample of students in the same grade scored on MAP Growth for each administration, which is an important interpretation of RIT scores. This is useful for understanding (1) how student scores compare to peers nationwide and (2) the relative rigor of a state's performance level designations for its summative assessment.

The MAP Growth spring cut scores for Grades 3–8 could be calculated using the equipercntile linking method because that data are directly connected to the NYSTP spring data used in the study. The equipercntile linking procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of tests at or below each score). For example, let x represent a score on Test X (e.g., NYSTP). Its equipercntile equivalent score on Test Y (e.g., MAP Growth), $e_y(x)$, can be obtained through a cumulative-distribution-based linking function defined in Equation 1:

$$e_y(x) = G^{-1}[P(x)] \quad (1)$$

where $e_y(x)$ is the equipercentile equivalent of score x on NYSTP on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on NYSTP, and G^{-1} is the inverse of the percentile rank function for MAP Growth that indicates the score on MAP Growth corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the score distributions and equipercentile linking curve.

The MAP Growth conditional growth norms provide students' expected score gains across terms, such as growth from fall or winter to spring within the same grade or from spring of a lower grade to the spring of the adjacent higher grade. This information can be used to calculate the fall and winter cut scores for Grades 3–8 and the fall, winter, and spring cut scores for Grade 2. Equation 2 was used to determine the previous term's or grade's MAP Growth score needed to reach the spring cut score, considering the expected growth associated with the previous RIT score:

$$RIT_{PredSpring} = RIT_{previous} + g \quad (2)$$

where:

- $RIT_{PredSpring}$ is the predicted MAP Growth spring score.
- $RIT_{previous}$ is the previous term's or grade's RIT score.
- g is the expected growth from the previous RIT (e.g., fall or winter) to the spring RIT.

To derive the spring cut scores for Grade 2, the growth score from spring of one year to the next was used (i.e., the growth score from spring Grade 2 to spring Grade 3). The calculation of fall and winter cuts for Grade 2 followed the same process as the other grades. For example, the growth score from fall to spring in Grade 2 was used to calculate the fall cuts for Grade 2.

2.4. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the NYSTP tests can be described using classification accuracy statistics based on the MAP Growth spring cut scores that show the proportion of students correctly classified by their RIT scores as proficient (*Level III* or *Level IV*) or not proficient (*Level I* or *Level II*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich, Hanson, Harris, & Scoring, 2004). The results are based on the Spring 2018 MAP Growth and NYSTP data for the *Level III* cut score.

Since New York students do not begin taking the NYSTP assessment until Grade 3, longitudinal data were collected for the 2017–2018 Grade 3 cohort in order to link the NYSTP assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. To accomplish this, 2017–2018 NYSTP Grade 3 results were linked to MAP Growth data from Grade 3 students in 2017–2018 and Grade 2 students in 2016–2017. In this way, the data came from the same cohort of students beginning when they were in Grade 2 and continuing through Grade 3.

Table 2.1. Description of Classification Accuracy Summary Statistics

Statistic	Description*	Interpretation
Overall Classification Accuracy Rate	$(TP + TN) / (\text{total sample size})$	Proportion of the study sample whose proficiency classification on the state test was correctly predicted by MAP Growth cut scores
False Negative (FN) Rate	$FN / (FN + TP)$	Proportion of not-proficient students identified by MAP Growth in those observed as proficient on the state test
False Positive (FP) Rate	$FP / (FP + TN)$	Proportion of proficient students identified by MAP Growth in those observed as not proficient on the state test
Sensitivity	$TP / (TP + FN)$	Proportion of proficient students identified by MAP Growth in those observed as such on the state test
Specificity	$TN / (TN + FP)$	Proportion of not-proficient students identified by MAP Growth in those observed as such on the state test
Precision	$TP / (TP + FP)$	Proportion of observed proficient students on the state test in those identified as such by the MAP Growth test
Area Under the Curve (AUC)	Area under the receiver operating characteristics (ROC) curve	How well MAP Growth cut scores separate the study sample into proficiency categories that match those from the state test cut scores. An AUC at or above 0.80 is considered “good” accuracy.

*FP = false positives. FN = false negatives. TP = true positives. TN = true negatives.

2.5. Proficiency Projection

In addition to calculating the MAP Growth fall and winter cut scores, the MAP Growth conditional growth norms data were also used to calculate the probability of reaching proficiency on the NYSTP test based on a student’s RIT scores from fall, winter, and spring. Equation 3 was used to calculate the probability of a student achieving *Level III* proficiency on the NYSTP test based on their fall or winter RIT score:

$$Pr(\text{Achieving Level III in spring} | \text{starting RIT}) = \Phi \left(\frac{RIT_{previous} + g - RIT_{SpringCut}}{SD} \right) \quad (3)$$

where:

- Φ is a standardized normal cumulative distribution.
- $RIT_{previous}$ is the student’s RIT score in fall or winter (or in spring of Grade 2).
- g is the expected growth from the previous RIT (e.g., fall or winter) to the spring RIT.
- $RIT_{SpringCut}$ is the MAP Growth *Level III* cut score for spring. For Grade 2, this is the Grade 3 cut score for spring.
- SD is the conditional standard deviation of the expected growth, g .

Equation 4 was used to estimate the probability of a student achieving *Level III* proficiency on the NYSTP test based on their spring RIT score (RIT_{Spring}):

$$Pr(\text{Achieving Level III in spring} | \text{spring RIT}) = \Phi \left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE} \right) \quad (4)$$

where SE is the standard error of measurement for MAP Growth.

3. Results

3.1. Study Sample

Only students who took both the MAP Growth and NYSTP assessments in Spring 2018 were included in the study sample. Data used in this study were collected from 23 districts and 214 schools in New York. Table 3.1 presents the demographic distributions of race, sex, and performance level in the original unweighted study sample, and Table 3.2 presents the distributions of the student population that took the Spring 2018 NYSTP tests (NYSED, 2018). Since the unweighted data are different from the general NYSTP population, post-stratification weights were applied to the linking study sample to improve its representativeness. Table 3.3 presents the demographic distributions of the sample after weighting, which are almost identical to the NYSTP student population distributions. The analyses in this study were therefore conducted based on the weighted sample.

Table 3.1. Linking Study Sample Demographics (Unweighted)

Linking Study Sample (Unweighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		6,328	6,477	6,202	6,075	5,481	5,187
Race	Asian	8.7	10.0	9.3	9.3	10.5	10.5
	Black	12.5	12.0	12.4	14.0	11.4	14.0
	Hispanic	20.6	19.5	21.7	21.6	22.5	23.2
	Multi-Race	5.2	5.0	4.7	4.0	3.7	2.9
	Other	0.9	0.8	0.6	0.9	0.5	0.9
	White	52.1	52.7	51.2	50.2	51.4	48.5
Sex	Female	51.4	50.6	50.2	49.9	50.0	50.6
	Male	48.6	49.4	49.8	50.1	50.0	49.4
Performance Level	<i>Level I</i>	14.3	15.8	28.7	21.8	22.8	13.2
	<i>Level II</i>	32.6	33.3	33.0	23.5	33.9	35.0
	<i>Level III</i>	46.3	34.0	24.9	25.7	31.9	30.2
	<i>Level IV</i>	6.7	16.8	13.4	29.0	11.3	21.6
Mathematics							
Total N		6,468	6,565	6,358	6,281	5,413	4,449
Race	Asian	8.8	10.2	9.4	9.2	9.4	5.5
	Black	12.6	11.9	12.3	13.6	11.4	15.6
	Hispanic	20.9	19.5	21.5	21.1	22.6	24.7
	Multi-Race	5.1	4.8	4.6	4.0	3.7	3.1
	Other	0.8	0.8	0.6	0.8	0.5	1.0
	White	51.7	52.8	51.5	51.3	52.4	50.2
Sex	Female	51.7	50.4	50.1	49.6	50.0	50.8
	Male	48.3	49.6	49.9	50.4	50.0	49.2
Performance Level	<i>Level I</i>	20.1	22.4	29.4	25.8	25.3	31.9
	<i>Level II</i>	22.4	27.0	24.9	26.5	29.3	35.3
	<i>Level III</i>	33.4	26.2	24.9	25.6	26.6	21.0
	<i>Level IV</i>	24.0	24.4	20.8	22.1	18.8	11.8

Table 3.2. Spring 2018 NYSTP Student Population Demographics

Spring 2018 NYSTP Population							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA							
Total N		182,885	184,266	177,609	173,183	161,958	154,663
Race	Asian	9.8	10.1	10.6	10.5	10.7	11.4
	Black	17.4	17.7	18.0	18.5	19.0	19.3
	Hispanic	27.9	27.5	27.7	27.5	27.4	27.1
	Multi-Race	2.9	2.6	2.4	2.2	1.9	1.6
	Other	2.1	2.1	2.1	2.3	2.2	2.1
	White	39.9	39.9	39.1	39.0	38.8	38.6
Sex	Female	49.3	49.2	49.4	49.0	48.6	48.4
	Male	50.7	50.8	50.6	51.0	51.4	51.6
Performance Level	<i>Level I</i>	18.0	19.6	33.3	27.8	28.7	19.0
	<i>Level II</i>	31.6	33.0	30.3	23.1	31.4	33.3
	<i>Level III</i>	43.2	29.5	22.3	22.2	28.0	27.1
	<i>Level IV</i>	7.2	17.9	14.1	26.9	12.0	20.6
Mathematics							
Total N		184,970	186,331	178,875	173,731	160,487	116,534
Race	Asian	10.0	10.3	10.7	10.7	10.9	9.4
	Black	17.3	17.6	17.8	18.3	18.8	20.5
	Hispanic	28.1	27.7	27.8	27.6	27.7	30.0
	Multi-Race	2.8	2.6	2.4	2.2	1.9	1.5
	Other	1.8	1.9	1.9	2.0	1.9	1.8
	White	39.9	39.9	39.3	39.2	38.8	36.8
Sex	Female	49.0	48.9	49.2	48.8	48.4	47.7
	Male	51.0	51.1	50.8	51.2	51.6	52.3
Performance Level	<i>Level I</i>	24.5	26.1	33.2	31.3	33.4	38.2
	<i>Level II</i>	22.2	26.3	23.8	24.9	25.7	31.5
	<i>Level III</i>	30.5	23.0	22.9	22.7	23.0	18.1
	<i>Level IV</i>	22.9	24.6	20.2	21.0	18.0	12.2

Table 3.3. Linking Study Sample Demographics (Weighted)

Linking Study Sample (Weighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		6,328	6,477	6,202	6,075	5,486	5,187
Race	Asian	9.8	10.1	10.6	10.5	10.7	11.4
	Black	17.4	17.7	18.0	18.5	19.0	19.3
	Hispanic	27.9	27.5	27.7	27.5	27.4	27.1
	Multi-Race	2.9	2.6	2.4	2.2	1.9	1.6
	Other	2.1	2.1	2.1	2.3	2.2	2.1
	White	39.9	39.9	39.1	39.0	38.8	38.6
Sex	Female	49.3	49.2	49.4	49.0	48.6	48.4
	Male	50.7	50.8	50.6	51.0	51.4	51.6
Performance Level	<i>Level I</i>	18.0	19.6	33.3	27.8	28.7	19.0
	<i>Level II</i>	31.6	33.0	30.3	23.1	31.4	33.3
	<i>Level III</i>	43.2	29.5	22.3	22.2	28.0	27.1
	<i>Level IV</i>	7.2	17.9	14.1	26.9	12.0	20.6
Mathematics							
Total N		6,474	6,565	6,364	6,275	5,418	4,449
Race	Asian	10.0	10.3	10.7	10.7	10.9	9.4
	Black	17.3	17.6	17.8	18.3	18.8	20.5
	Hispanic	28.1	27.7	27.8	27.6	27.7	30.0
	Multi-Race	2.8	2.6	2.4	2.2	1.9	1.5
	Other	1.8	1.9	1.9	2.0	1.9	1.8
	White	39.9	39.9	39.3	39.2	38.8	36.8
Sex	Female	49.0	48.9	49.2	48.8	48.4	47.7
	Male	51.0	51.1	50.8	51.2	51.6	52.3
Performance Level	<i>Level I</i>	24.5	26.1	33.2	31.3	33.4	38.2
	<i>Level II</i>	22.2	26.3	23.8	24.9	25.7	31.5
	<i>Level III</i>	30.5	23.0	22.9	22.7	23.0	18.1
	<i>Level IV</i>	22.9	24.6	20.2	21.0	18.0	12.2

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and NYSTP test scores from Spring 2018, including the correlation coefficient (*r*) between them. The correlation coefficients between the scores range from 0.74 to 0.78 for ELA/Reading and 0.81 to 0.87 for Mathematics. These values indicate a strong relationship among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on the NYSTP assessments.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	r	NYSTP*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	6,328	0.76	599.9	19.7	530	655	198.3	15.5	141	235
4	6,477	0.75	599.8	19.4	536	654	205.4	15.2	143	247
5	6,202	0.78	600.6	18.9	518	657	211.5	14.9	143	258
6	6,075	0.75	600.1	19.0	523	657	215.7	14.6	151	257
7	5,486	0.76	600.1	19.3	516	654	219.8	14.9	150	262
8	5,187	0.74	600.0	19.2	507	651	222.4	15.3	148	262
Mathematics										
3	6,474	0.81	599.8	18.9	531	646	201.1	12.7	131	257
4	6,565	0.85	599.4	19.0	538	650	211.7	14.3	146	265
5	6,364	0.87	599.4	19.2	536	654	221.3	16.7	146	284
6	6,275	0.87	599.8	19.2	537	656	223.5	16.8	154	280
7	5,418	0.86	599.6	18.9	529	644	228.5	17.9	155	293
8	4,449	0.83	600.2	18.9	531	651	230.9	18.8	150	299

*SD = standard deviation. Min. = minimum. Max. = maximum.

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the NYSTP scale score ranges and the corresponding MAP Growth RIT cut scores and percentile ranges by content area and grade. These tables can be used to predict a student’s likely performance level on the NYSTP spring assessment when MAP Growth is taken in the fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading RIT score of 191 in the fall is likely to reach *Level III* proficiency on the NYSTP ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 201 in the spring is also likely to reach *Level III* proficiency on the NYSTP. The spring cut score is higher than the fall cut score because growth is expected between fall and spring as students receive more instruction during the school year.

Within this report, the cut scores for fall and winter are derived from the spring cuts and the typical growth scores from fall-to-spring or winter-to-spring. The typical growth scores are based on the default instructional weeks most commonly encountered for each term (Weeks 4, 20, and 32 for fall, winter, and spring, respectively). Since instructional weeks often vary by district, the cut scores in this report may differ slightly from the MAP Growth score reports that reflect instructional weeks set by partners. If the actual instructional weeks deviate from the default ones, a student’s projected performance level could be different from the generic projection presented in this document. Partners are therefore encouraged to use the projected performance level in students’ profile, classroom, and grade reports in the NWEA reporting system since they reflect the specific instructional weeks set by partners.

Table 3.5. MAP Growth Cut Scores—ELA/Reading

NYSTP ELA									
Grade	Level I		Level II		Level III		Level IV		
3	530–582		583–601		602–628		629–655		
4	532–583		584–602		603–618		619–654		
5	509–593		594–608		609–621		622–661		
6	514–589		590–601		602–613		614–657		
7	511–590		591–606		607–622		623–654		
8	507–583		584–602		603–616		617–651		
MAP Growth Reading*									
Grade	Level I		Level II		Level III		Level IV		
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile	
Fall									
2	100–156	1–15	157–176	16–61	177–202	62–97	203–350	98–99	
3	100–173	1–21	174–190	22–59	191–212	60–93	213–350	94–99	
4	100–183	1–22	184–200	23–59	201–214	60–85	215–350	86–99	
5	100–199	1–38	200–211	39–67	212–222	68–86	223–350	87–99	
6	100–202	1–32	203–213	33–58	214–224	59–81	225–350	82–99	
7	100–208	1–37	209–221	38–67	222–234	68–89	235–350	90–99	
8	100–210	1–33	211–222	34–61	223–235	62–84	236–350	85–99	
Winter									
2	100–166	1–16	167–185	17–62	186–209	63–96	210–350	97–99	
3	100–181	1–22	182–197	23–59	198–217	60–92	218–350	93–99	
4	100–190	1–23	191–206	24–60	207–218	61–84	219–350	85–99	
5	100–204	1–39	205–215	40–66	216–225	67–85	226–350	86–99	
6	100–206	1–32	207–217	33–59	218–226	60–79	227–350	80–99	
7	100–212	1–39	213–223	40–66	224–235	67–87	236–350	88–99	
8	100–213	1–34	214–224	35–60	225–236	61–83	237–350	84–99	
Spring									
2	100–171	1–18	172–189	19–60	190–212	61–95	213–350	96–99	
3	100–185	1–24	186–200	25–58	201–219	59–91	220–350	92–99	
4	100–193	1–24	194–208	25–59	209–220	60–83	221–350	84–99	
5	100–206	1–39	207–217	40–66	218–226	67–83	227–350	84–99	
6	100–208	1–34	209–218	35–58	219–227	59–77	228–350	78–99	
7	100–213	1–38	214–224	39–65	225–236	66–86	237–350	87–99	
8	100–214	1–34	215–225	35–59	226–237	60–82	238–350	83–99	

*Cut scores for fall and winter are derived from the spring cuts and growth norms based on the typical instructional weeks. Spring cut scores for Grade 2 were derived from the Grade 3 cuts using the growth norms. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

Table 3.6. MAP Growth Cut Scores—Mathematics

NYSTP Mathematics									
Grade	Level I		Level II		Level III		Level IV		
3	526–586		587–599		600 –614		615–646		
4	525–587		588–601		602 –613		614–650		
5	527–591		592–603		604 –615		616–654		
6	528–591		592–603		604 –615		616–656		
7	524–592		593–605		606 –617		618–644		
8	527–595		596–609		610 –621		622–651		
MAP Growth Mathematics*									
Grade	Level I		Level II		Level III		Level IV		
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile	
Fall									
2	100–165	1–23	166–175	24–52	176 –186	53–81	187–350	82–99	
3	100–179	1–25	180–188	26–51	189 –198	52–77	199–350	78–99	
4	100–192	1–31	193–202	32–58	203 –211	59–80	212–350	81–99	
5	100–204	1–38	205–215	39–66	216 –225	67–86	226–350	87–99	
6	100–208	1–35	209–218	36–59	219 –229	60–82	230–350	83–99	
7	100–215	1–39	216–226	40–64	227 –238	65–85	239–350	86–99	
8	100–221	1–43	222–235	44–71	236 –246	72–87	247–350	88–99	
Winter									
2	100–174	1–23	175–184	24–52	185 –194	53–79	195–350	80–99	
3	100–187	1–26	188–196	27–51	197 –205	52–75	206–350	76–99	
4	100–199	1–33	200–209	34–59	210 –218	60–80	219–350	81–99	
5	100–210	1–40	211–221	41–67	222 –231	68–85	232–350	86–99	
6	100–213	1–36	214–223	37–59	224 –234	60–81	235–350	82–99	
7	100–218	1–38	219–230	39–64	231 –242	65–84	243–350	85–99	
8	100–224	1–43	225–238	44–70	239 –249	71–86	250–350	87–99	
Spring									
2	100–180	1–26	181–189	27–51	190 –199	52–77	200–350	78–99	
3	100–192	1–27	193–201	28–52	202 –210	53–75	211–350	76–99	
4	100–203	1–33	204–213	34–58	214 –222	59–78	223–350	79–99	
5	100–214	1–40	215–225	41–66	226 –235	67–84	236–350	85–99	
6	100–216	1–36	217–226	37–58	227 –237	59–80	238–350	81–99	
7	100–221	1–39	222–233	40–64	234 –245	65–84	246–350	85–99	
8	100–226	1–42	227–240	43–69	241 –251	70–85	252–350	86–99	

*Cut scores for fall and winter are derived from the spring cuts and growth norms based on the typical instructional weeks. Spring cut scores for Grade 2 were derived from the Grade 3 cuts using the growth norms. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

3.4. Classification Accuracy

Table 3.7 presents the classification accuracy summary statistics, including the overall classification accuracy rate. These results indicate how well MAP Growth spring RIT scores predict proficiency on the NYSTP tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.78 to 0.81 for ELA/Reading and 0.79 to 0.88 for Mathematic. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the NYSTP assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on NYSTP in Grade 3.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the NYSTP tests, there is a notable limitation to how these results should be used and interpreted. NYSTP and MAP Growth assessments are designed for different purposes and measure slightly different constructs even within the same content area. Therefore, scores on the two tests cannot be assumed to be interchangeable. MAP Growth may not be used as a substitute for the state tests and vice versa.

Table 3.7. Classification Accuracy Results

Grade	N	Spring Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	Precision	AUC*
		MAP Growth	NYSTP		FP	FN				
ELA/Reading										
2	3,950	190	602	0.78	0.18	0.26	0.74	0.82	0.79	0.87
3	6,328	201	602	0.81	0.18	0.20	0.80	0.82	0.82	0.89
4	6,477	209	603	0.80	0.18	0.22	0.78	0.82	0.80	0.89
5	6,202	218	609	0.81	0.15	0.25	0.75	0.85	0.74	0.89
6	6,075	219	602	0.80	0.17	0.22	0.78	0.83	0.82	0.89
7	5,486	225	607	0.81	0.17	0.23	0.77	0.83	0.75	0.89
8	5,187	226	603	0.79	0.18	0.24	0.76	0.82	0.80	0.88
Mathematics										
2	4,306	190	600	0.79	0.25	0.18	0.82	0.75	0.80	0.86
3	6,474	202	600	0.84	0.16	0.17	0.83	0.84	0.86	0.91
4	6,565	214	602	0.86	0.14	0.15	0.85	0.86	0.84	0.94
5	6,364	226	604	0.87	0.10	0.17	0.83	0.90	0.87	0.95
6	6,275	227	604	0.88	0.11	0.12	0.88	0.89	0.86	0.96
7	5,418	234	606	0.88	0.10	0.14	0.86	0.90	0.85	0.95
8	4,449	241	610	0.88	0.09	0.20	0.80	0.91	0.80	0.94

*Class. Accuracy = overall classification accuracy rate. FP = false positives. FN = false negatives. AUC = area under the ROC curve.

3.5. Proficiency Projection

Table 3.8 and Table 3.9 present the estimated probability of achieving *Level III* performance on the NYSTP test based on RIT scores from fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 201 in the fall has an 89% chance of reaching *Level III* proficiency or higher on the NYSTP test. “Prob.” indicates the probability of obtaining proficient status on the NYSTP test in the spring.

Table 3.8. Proficiency Projection based on RIT Scores—ELA/Reading

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall		Winter		Spring				
			Fall RIT	Projected Proficiency	Winter RIT	Projected Proficiency	Spring RIT	Projected Proficiency			
				Level III		Prob.		Level III	Prob.	Level III	Prob.
2	5	190	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	190	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	190	157	No	0.01	166	No	<0.01	170	No	<0.01
	20	190	160	No	0.02	169	No	<0.01	173	No	<0.01
	25	190	162	No	0.03	171	No	<0.01	175	No	<0.01
	30	190	164	No	0.06	173	No	0.01	177	No	<0.01
	35	190	166	No	0.09	175	No	0.03	180	No	<0.01
	40	190	168	No	0.15	177	No	0.07	182	No	0.01
	45	190	170	No	0.18	179	No	0.10	184	No	0.03
	50	190	172	No	0.25	181	No	0.17	186	No	0.11
	55	190	174	No	0.35	183	No	0.29	188	No	0.27
	60	190	176	No	0.45	185	No	0.43	189	No	0.38
	65	190	178	Yes	0.55	187	Yes	0.57	192	Yes	0.73
	70	190	180	Yes	0.60	189	Yes	0.71	194	Yes	0.89
	75	190	183	Yes	0.75	191	Yes	0.83	196	Yes	0.97
	80	190	185	Yes	0.82	194	Yes	0.93	199	Yes	>0.99
85	190	188	Yes	0.88	197	Yes	0.98	202	Yes	>0.99	
90	190	192	Yes	0.96	200	Yes	>0.99	205	Yes	>0.99	
95	190	197	Yes	0.99	206	Yes	>0.99	211	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
3	5	201	159	No	<0.01	167	No	<0.01	170	No	<0.01
	10	201	165	No	<0.01	173	No	<0.01	176	No	<0.01
	15	201	169	No	0.01	177	No	<0.01	180	No	<0.01
	20	201	173	No	0.02	180	No	<0.01	183	No	<0.01
	25	201	175	No	0.03	183	No	<0.01	186	No	<0.01
	30	201	178	No	0.07	185	No	0.01	189	No	<0.01
	35	201	180	No	0.09	188	No	0.05	191	No	<0.01
	40	201	182	No	0.14	190	No	0.07	193	No	0.01
	45	201	185	No	0.25	192	No	0.13	195	No	0.03
	50	201	187	No	0.30	194	No	0.23	197	No	0.11
	55	201	189	No	0.39	196	No	0.35	199	No	0.27
	60	201	191	Yes	0.50	198	Yes	0.50	201	Yes	0.50
	65	201	193	Yes	0.61	200	Yes	0.65	203	Yes	0.73
	70	201	195	Yes	0.66	202	Yes	0.77	206	Yes	0.94
	75	201	198	Yes	0.79	205	Yes	0.91	208	Yes	0.99
	80	201	201	Yes	0.89	207	Yes	0.95	211	Yes	>0.99
	85	201	204	Yes	0.93	211	Yes	0.99	214	Yes	>0.99
90	201	208	Yes	0.98	215	Yes	>0.99	218	Yes	>0.99	
95	201	214	Yes	>0.99	220	Yes	>0.99	224	Yes	>0.99	
4	5	209	169	No	<0.01	176	No	<0.01	178	No	<0.01
	10	209	175	No	<0.01	182	No	<0.01	184	No	<0.01
	15	209	179	No	<0.01	186	No	<0.01	188	No	<0.01
	20	209	183	No	0.01	189	No	<0.01	191	No	<0.01
	25	209	185	No	0.03	192	No	<0.01	194	No	<0.01
	30	209	188	No	0.05	194	No	0.01	196	No	<0.01
	35	209	190	No	0.08	196	No	0.03	199	No	<0.01
	40	209	192	No	0.13	198	No	0.06	201	No	0.01
	45	209	195	No	0.20	200	No	0.09	203	No	0.03
	50	209	197	No	0.29	202	No	0.17	205	No	0.11
	55	209	199	No	0.39	205	No	0.35	207	No	0.27
	60	209	201	Yes	0.50	207	Yes	0.50	209	Yes	0.50
	65	209	203	Yes	0.56	209	Yes	0.65	211	Yes	0.73
	70	209	205	Yes	0.66	211	Yes	0.78	213	Yes	0.89
	75	209	208	Yes	0.80	213	Yes	0.87	216	Yes	0.99
	80	209	211	Yes	0.87	216	Yes	0.96	219	Yes	>0.99
	85	209	214	Yes	0.94	219	Yes	0.99	222	Yes	>0.99
90	209	218	Yes	0.97	223	Yes	>0.99	226	Yes	>0.99	
95	209	224	Yes	>0.99	229	Yes	>0.99	232	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
5	5	218	178	No	<0.01	183	No	<0.01	185	No	<0.01
	10	218	183	No	<0.01	189	No	<0.01	191	No	<0.01
	15	218	187	No	<0.01	193	No	<0.01	194	No	<0.01
	20	218	191	No	<0.01	196	No	<0.01	198	No	<0.01
	25	218	193	No	0.01	198	No	<0.01	200	No	<0.01
	30	218	196	No	0.03	201	No	<0.01	203	No	<0.01
	35	218	198	No	0.04	203	No	0.01	205	No	<0.01
	40	218	200	No	0.06	205	No	0.02	207	No	<0.01
	45	218	202	No	0.11	207	No	0.04	209	No	<0.01
	50	218	204	No	0.17	209	No	0.09	211	No	0.01
	55	218	207	No	0.24	211	No	0.17	213	No	0.06
	60	218	209	No	0.34	213	No	0.28	215	No	0.17
	65	218	211	No	0.44	215	No	0.42	217	No	0.38
	70	218	213	Yes	0.50	217	Yes	0.50	219	Yes	0.62
	75	218	216	Yes	0.66	220	Yes	0.72	222	Yes	0.89
	80	218	218	Yes	0.76	222	Yes	0.83	224	Yes	0.97
85	218	221	Yes	0.83	226	Yes	0.96	228	Yes	>0.99	
90	218	225	Yes	0.94	229	Yes	0.99	231	Yes	>0.99	
95	218	231	Yes	0.99	235	Yes	>0.99	237	Yes	>0.99	
6	5	219	183	No	<0.01	188	No	<0.01	189	No	<0.01
	10	219	189	No	<0.01	193	No	<0.01	195	No	<0.01
	15	219	193	No	<0.01	197	No	<0.01	199	No	<0.01
	20	219	196	No	0.01	200	No	<0.01	202	No	<0.01
	25	219	199	No	0.03	203	No	<0.01	205	No	<0.01
	30	219	202	No	0.06	205	No	0.01	207	No	<0.01
	35	219	204	No	0.10	208	No	0.04	209	No	<0.01
	40	219	206	No	0.16	210	No	0.09	211	No	0.01
	45	219	208	No	0.19	212	No	0.17	213	No	0.03
	50	219	210	No	0.28	214	No	0.28	215	No	0.11
	55	219	212	No	0.39	216	No	0.35	217	No	0.27
	60	219	214	Yes	0.50	218	Yes	0.50	219	Yes	0.50
	65	219	217	Yes	0.61	220	Yes	0.65	222	Yes	0.83
	70	219	219	Yes	0.72	222	Yes	0.78	224	Yes	0.94
	75	219	221	Yes	0.81	225	Yes	0.91	226	Yes	0.99
	80	219	224	Yes	0.87	227	Yes	0.96	229	Yes	>0.99
85	219	227	Yes	0.94	230	Yes	0.99	232	Yes	>0.99	
90	219	231	Yes	0.98	234	Yes	>0.99	236	Yes	>0.99	
95	219	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99	

ELA/Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
7	5	225	187	No	<0.01	190	No	<0.01	191	No	<0.01
	10	225	193	No	<0.01	196	No	<0.01	197	No	<0.01
	15	225	197	No	<0.01	200	No	<0.01	201	No	<0.01
	20	225	200	No	<0.01	203	No	<0.01	205	No	<0.01
	25	225	203	No	0.01	206	No	<0.01	207	No	<0.01
	30	225	206	No	0.02	209	No	<0.01	210	No	<0.01
	35	225	208	No	0.04	211	No	0.01	212	No	<0.01
	40	225	210	No	0.08	213	No	0.02	214	No	<0.01
	45	225	212	No	0.10	215	No	0.04	216	No	<0.01
	50	225	214	No	0.16	217	No	0.09	218	No	0.01
	55	225	216	No	0.24	219	No	0.17	220	No	0.06
	60	225	218	No	0.33	221	No	0.28	223	No	0.27
	65	225	221	No	0.44	223	No	0.42	225	Yes	0.50
	70	225	223	Yes	0.56	226	Yes	0.65	227	Yes	0.73
	75	225	225	Yes	0.67	228	Yes	0.78	229	Yes	0.89
	80	225	228	Yes	0.81	231	Yes	0.91	232	Yes	0.99
85	225	231	Yes	0.88	234	Yes	0.97	235	Yes	>0.99	
90	225	235	Yes	0.96	238	Yes	>0.99	239	Yes	>0.99	
95	225	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99	
8	5	226	190	No	<0.01	193	No	<0.01	194	No	<0.01
	10	226	196	No	<0.01	199	No	<0.01	200	No	<0.01
	15	226	200	No	<0.01	203	No	<0.01	204	No	<0.01
	20	226	204	No	0.01	206	No	<0.01	207	No	<0.01
	25	226	207	No	0.03	209	No	<0.01	210	No	<0.01
	30	226	209	No	0.05	212	No	0.01	213	No	<0.01
	35	226	211	No	0.06	214	No	0.02	215	No	<0.01
	40	226	214	No	0.13	216	No	0.04	217	No	<0.01
	45	226	216	No	0.20	218	No	0.09	220	No	0.03
	50	226	218	No	0.29	221	No	0.22	222	No	0.11
	55	226	220	No	0.34	223	No	0.35	224	No	0.27
	60	226	222	No	0.45	225	Yes	0.50	226	Yes	0.50
	65	226	225	Yes	0.61	227	Yes	0.65	228	Yes	0.73
	70	226	227	Yes	0.71	229	Yes	0.78	231	Yes	0.94
	75	226	230	Yes	0.80	232	Yes	0.91	233	Yes	0.99
	80	226	232	Yes	0.87	235	Yes	0.97	236	Yes	>0.99
85	226	236	Yes	0.95	238	Yes	0.99	239	Yes	>0.99	
90	226	240	Yes	0.99	242	Yes	>0.99	243	Yes	>0.99	
95	226	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

Table 3.9. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
Grade	Start %ile	Spring Cut	Fall		Winter			Spring			
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
2	5	190	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	190	158	No	0.01	167	No	<0.01	172	No	<0.01
	15	190	162	No	0.03	171	No	<0.01	175	No	<0.01
	20	190	164	No	0.04	173	No	0.01	178	No	<0.01
	25	190	166	No	0.08	175	No	0.03	180	No	<0.01
	30	190	168	No	0.14	177	No	0.07	182	No	<0.01
	35	190	170	No	0.22	179	No	0.15	184	No	0.02
	40	190	172	No	0.32	181	No	0.20	186	No	0.08
	45	190	173	No	0.38	182	No	0.26	188	No	0.25
	50	190	175	No	0.44	184	No	0.42	189	No	0.37
	55	190	177	Yes	0.56	186	Yes	0.58	191	Yes	0.63
	60	190	178	Yes	0.62	187	Yes	0.66	193	Yes	0.85
	65	190	180	Yes	0.73	189	Yes	0.80	195	Yes	0.96
	70	190	182	Yes	0.82	191	Yes	0.90	196	Yes	0.98
	75	190	184	Yes	0.89	193	Yes	0.95	198	Yes	>0.99
	80	190	186	Yes	0.92	195	Yes	0.98	201	Yes	>0.99
	85	190	188	Yes	0.96	198	Yes	>0.99	203	Yes	>0.99
90	190	192	Yes	0.99	201	Yes	>0.99	207	Yes	>0.99	
95	190	196	Yes	>0.99	205	Yes	>0.99	212	Yes	>0.99	
3	5	202	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	202	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	202	175	No	0.01	182	No	<0.01	186	No	<0.01
	20	202	177	No	0.03	185	No	0.01	189	No	<0.01
	25	202	179	No	0.05	187	No	0.02	192	No	<0.01
	30	202	181	No	0.10	189	No	0.04	194	No	<0.01
	35	202	183	No	0.17	191	No	0.10	196	No	0.02
	40	202	185	No	0.26	193	No	0.20	198	No	0.08
	45	202	187	No	0.37	195	No	0.33	199	No	0.15
	50	202	188	No	0.44	196	No	0.42	201	No	0.37
	55	202	190	Yes	0.56	198	Yes	0.58	203	Yes	0.63
	60	202	192	Yes	0.63	200	Yes	0.74	205	Yes	0.85
	65	202	194	Yes	0.74	201	Yes	0.80	207	Yes	0.96
	70	202	196	Yes	0.83	203	Yes	0.90	208	Yes	0.98
	75	202	198	Yes	0.90	205	Yes	0.96	211	Yes	>0.99
	80	202	200	Yes	0.95	208	Yes	0.99	213	Yes	>0.99
	85	202	202	Yes	0.97	210	Yes	>0.99	216	Yes	>0.99
90	202	206	Yes	>0.99	214	Yes	>0.99	219	Yes	>0.99	
95	202	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
4	5	214	176	No	<0.01	182	No	<0.01	185	No	<0.01
	10	214	181	No	<0.01	187	No	<0.01	191	No	<0.01
	15	214	185	No	<0.01	191	No	<0.01	194	No	<0.01
	20	214	187	No	0.01	194	No	<0.01	197	No	<0.01
	25	214	190	No	0.02	196	No	<0.01	200	No	<0.01
	30	214	192	No	0.04	198	No	0.01	202	No	<0.01
	35	214	194	No	0.07	200	No	0.02	205	No	<0.01
	40	214	196	No	0.13	202	No	0.04	207	No	0.01
	45	214	198	No	0.21	204	No	0.10	209	No	0.04
	50	214	200	No	0.32	206	No	0.20	211	No	0.15
	55	214	201	No	0.37	208	No	0.33	212	No	0.25
	60	214	203	Yes	0.50	210	Yes	0.50	214	Yes	0.50
	65	214	205	Yes	0.63	212	Yes	0.67	217	Yes	0.85
	70	214	207	Yes	0.74	214	Yes	0.80	219	Yes	0.96
	75	214	209	Yes	0.83	216	Yes	0.90	221	Yes	0.99
	80	214	212	Yes	0.93	219	Yes	0.97	224	Yes	>0.99
85	214	214	Yes	0.96	221	Yes	0.99	227	Yes	>0.99	
90	214	218	Yes	0.99	225	Yes	>0.99	230	Yes	>0.99	
95	214	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	
5	5	226	184	No	<0.01	189	No	<0.01	191	No	<0.01
	10	226	190	No	<0.01	194	No	<0.01	197	No	<0.01
	15	226	193	No	<0.01	198	No	<0.01	201	No	<0.01
	20	226	196	No	<0.01	201	No	<0.01	205	No	<0.01
	25	226	199	No	<0.01	204	No	<0.01	207	No	<0.01
	30	226	201	No	0.01	206	No	<0.01	210	No	<0.01
	35	226	203	No	0.02	209	No	<0.01	212	No	<0.01
	40	226	205	No	0.05	211	No	0.01	215	No	<0.01
	45	226	207	No	0.08	213	No	0.03	217	No	<0.01
	50	226	209	No	0.14	215	No	0.07	219	No	0.01
	55	226	211	No	0.22	217	No	0.15	221	No	0.04
	60	226	213	No	0.32	219	No	0.26	223	No	0.15
	65	226	215	No	0.44	221	No	0.42	225	No	0.37
	70	226	217	Yes	0.56	223	Yes	0.58	228	Yes	0.75
	75	226	219	Yes	0.68	225	Yes	0.74	230	Yes	0.92
	80	226	222	Yes	0.82	228	Yes	0.90	233	Yes	0.99
85	226	225	Yes	0.92	231	Yes	0.97	236	Yes	>0.99	
90	226	229	Yes	0.98	235	Yes	>0.99	240	Yes	>0.99	
95	226	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
6	5	227	188	No	<0.01	192	No	<0.01	194	No	<0.01
	10	227	194	No	<0.01	198	No	<0.01	200	No	<0.01
	15	227	198	No	<0.01	202	No	<0.01	205	No	<0.01
	20	227	201	No	<0.01	205	No	<0.01	208	No	<0.01
	25	227	204	No	0.01	208	No	<0.01	211	No	<0.01
	30	227	206	No	0.02	211	No	<0.01	214	No	<0.01
	35	227	209	No	0.06	213	No	0.01	216	No	<0.01
	40	227	211	No	0.10	215	No	0.03	218	No	<0.01
	45	227	213	No	0.17	217	No	0.07	221	No	0.02
	50	227	215	No	0.27	220	No	0.20	223	No	0.08
	55	227	217	No	0.38	222	No	0.34	225	No	0.25
	60	227	219	Yes	0.50	224	Yes	0.50	227	Yes	0.50
	65	227	221	Yes	0.62	226	Yes	0.66	230	Yes	0.85
	70	227	223	Yes	0.73	228	Yes	0.80	232	Yes	0.96
	75	227	226	Yes	0.86	231	Yes	0.93	235	Yes	>0.99
	80	227	228	Yes	0.92	234	Yes	0.98	238	Yes	>0.99
	85	227	231	Yes	0.97	237	Yes	>0.99	241	Yes	>0.99
90	227	235	Yes	0.99	241	Yes	>0.99	245	Yes	>0.99	
95	227	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	
7	5	234	192	No	<0.01	194	No	<0.01	196	No	<0.01
	10	234	198	No	<0.01	201	No	<0.01	203	No	<0.01
	15	234	202	No	<0.01	205	No	<0.01	207	No	<0.01
	20	234	206	No	<0.01	209	No	<0.01	211	No	<0.01
	25	234	208	No	<0.01	212	No	<0.01	214	No	<0.01
	30	234	211	No	<0.01	215	No	<0.01	217	No	<0.01
	35	234	213	No	0.01	217	No	<0.01	220	No	<0.01
	40	234	216	No	0.03	219	No	<0.01	222	No	<0.01
	45	234	218	No	0.07	222	No	0.03	224	No	<0.01
	50	234	220	No	0.13	224	No	0.07	227	No	0.01
	55	234	222	No	0.21	226	No	0.14	229	No	0.04
	60	234	225	No	0.37	229	No	0.33	231	No	0.15
	65	234	227	Yes	0.50	231	Yes	0.50	234	Yes	0.50
	70	234	229	Yes	0.63	233	Yes	0.67	236	Yes	0.75
	75	234	232	Yes	0.79	236	Yes	0.86	239	Yes	0.96
	80	234	235	Yes	0.90	239	Yes	0.96	242	Yes	>0.99
	85	234	238	Yes	0.96	243	Yes	>0.99	246	Yes	>0.99
90	234	243	Yes	>0.99	247	Yes	>0.99	251	Yes	>0.99	
95	234	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level III	Prob.		Level III	Prob.		Level III	Prob.
8	5	241	194	No	<0.01	196	No	<0.01	197	No	<0.01
	10	241	201	No	<0.01	203	No	<0.01	205	No	<0.01
	15	241	205	No	<0.01	208	No	<0.01	210	No	<0.01
	20	241	209	No	<0.01	212	No	<0.01	214	No	<0.01
	25	241	212	No	<0.01	215	No	<0.01	217	No	<0.01
	30	241	215	No	<0.01	218	No	<0.01	220	No	<0.01
	35	241	218	No	<0.01	221	No	<0.01	223	No	<0.01
	40	241	220	No	0.01	223	No	<0.01	225	No	<0.01
	45	241	223	No	0.03	226	No	<0.01	228	No	<0.01
	50	241	225	No	0.06	228	No	0.01	230	No	<0.01
	55	241	227	No	0.10	231	No	0.05	233	No	<0.01
	60	241	230	No	0.19	233	No	0.11	235	No	0.02
	65	241	232	No	0.28	236	No	0.27	238	No	0.15
	70	241	235	No	0.44	238	No	0.42	241	Yes	0.50
	75	241	238	Yes	0.61	241	Yes	0.66	244	Yes	0.85
	80	241	241	Yes	0.76	244	Yes	0.85	247	Yes	0.98
	85	241	245	Yes	0.90	248	Yes	0.97	251	Yes	>0.99
90	241	249	Yes	0.97	253	Yes	>0.99	256	Yes	>0.99	
95	241	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99	

References

- Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking*. New York: Springer.
- Lumley, T. (2019). *Survey: Analysis of complex survey samples*. R package version 3.36. Retrieved from <https://CRAN.R-project.org/package=survey>.
- NYSED. (2018) *New York State Testing Program 2018: English language arts and mathematics grades 3–8 technical report*. Albany, NY: New York State Education Department (NYSED). Retrieved from <http://www.p12.nysed.gov/assessment/reports/ei/tr38-18w.pdf>.
- Pommerich, M., Hanson, B., Harris, D., & Sconing, J. (2004). Issues in conducting linkage between distinct tests. *Applied Psychological Measurement*, 28(4), 247–273.
- Thum, Y. M., & Kuhfeld, M. (2020). *NWEA 2020 MAP Growth achievement status and growth norms for students and schools*. NWEA Research Report. Portland, OR: NWEA.