Linking Study Report: Predicting Performance on the Oklahoma School Testing Program (OSTP) based on NWEA MAP Growth Scores

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NWEA Psychometric Solutions

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Executive Summary

To predict student achievement on the Oklahoma School Testing Program (OSTP) assessments in Grades 3–8 English Language Arts (ELA) and Mathematics, NWEA® conducted a linking study using Spring 2017 and Spring 2018 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the OSTP 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 July 2019 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020).

Table E.1 presents the OSTP *Proficient* 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 *Proficient* cut score on the OSTP Grade 3 ELA test is 300. A Grade 3 student with a MAP Growth Reading RIT score of 197 in the fall is likely to meet proficiency on the OSTP ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 197 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 OSTP 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 OSTP Proficiency

Assessment		*Proficient* Cut Scores by Grade						
		2	3	4	5	6	7	8
ELA/Reading								
OSTP Spring		–	300	300	300	300	300	300
MAP Growth	Fall	184	197	205	210	217	224	225
	Winter	192	203	210	214	220	226	227
	Spring	196	206	212	216	221	227	228
Mathematics								
OSTP Spring		–	300	300	300	300	300	300
MAP Growth	Fall	181	194	204	215	223	228	240
	Winter	190	201	211	221	228	232	243
	Spring	195	206	215	225	231	235	245

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 OSTP Grades 3–8 ELA and Mathematics tests are Oklahoma's state summative assessments aligned to the Oklahoma Academic Standards (OAS). Based on their test scores, students are placed into one of four performance levels: *Below Basic*, *Basic*, *Proficient*, and *Advanced*. These tests are used to provide evidence of student achievement in ELA and Mathematics for various goals such as providing information to appropriately support federal and state accountability decisions. The *Proficient* 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 2017 and Spring 2018 test administrations, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring OSTP 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 OSTP 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 OSTP assessments in Spring 2017 and Spring 2018 were included in the study sample (i.e., students who took either the Spring 2017 MAP Growth and OSTP assessments or the Spring 2018 MAP Growth and OSTP assessments). Table E.2 presents the weighted number of Oklahoma students from six districts and 72 schools who were included in the linking study. 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.

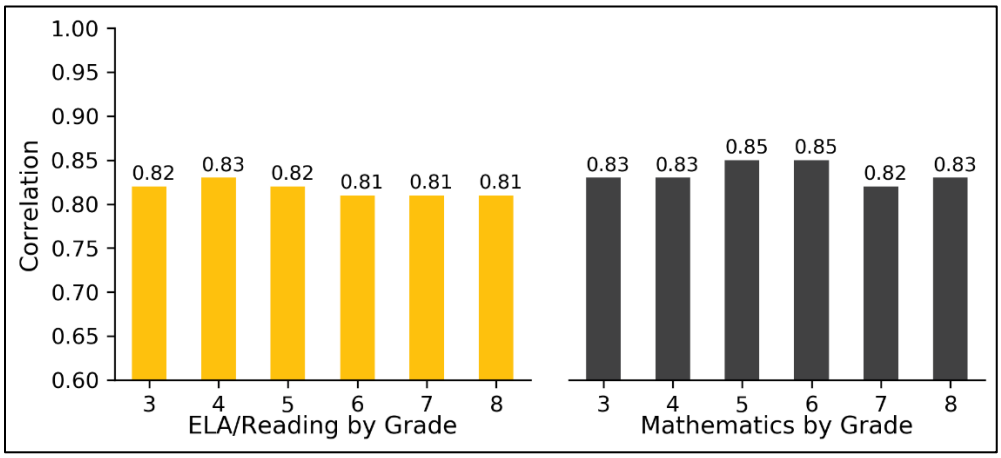
Table E.2. Linking Study Sample

	#Students	
Grade	ELA/Reading	Mathematics
3	4,064	4,056
4	3,757	3,793
5	3,577	3,544
6	3,290	3,310
7	2,694	2,664
8	3,009	3,065

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and OSTP scores range from 0.81 to 0.85 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 OSTP assessments.

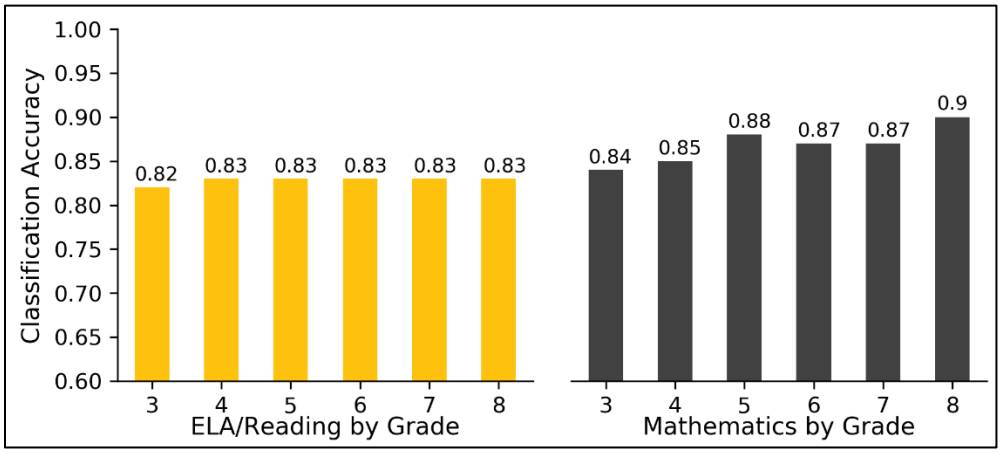
Figure E.1. Correlations between MAP Growth and OSTP



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 OSTP assessments. For example, the MAP Growth Reading Grade 3 *Proficient* cut score has a 0.82 accuracy rate, meaning it accurately classified student achievement on the state test for 82% of the sample. The results range from 0.82 to 0.90 across both content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the OSTP 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 Oklahoma School Testing Program (OSTP) Grades 3–8 English Language Arts (ELA) and Mathematics assessments with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2017 and Spring 2018 terms. The linking study has been updated since the previous version published in July 2019 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 OSTP test by Grade 3. This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth cut scores that correspond to the OSTP 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 OSTP tests
5. The probability of achieving grade-level proficiency on the OSTP assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The OSTP Grades 3–8 ELA and Mathematics summative assessments are aligned to the Oklahoma Academic Standards (OAS). 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: *Below Basic*, *Basic*, *Proficient*, and *Advanced*. The *Proficient* 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 2017 and 2018 administrations of MAP Growth and OSTP. NWEA recruited Oklahoma 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 Oklahoma 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 OSTP assessments in Spring 2017 or 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 equipercentile linking method (Kolen & Brennan, 2004) was used to identify the spring MAP Growth RIT scores that correspond to the spring OSTP 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 OSTP 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 MAP Growth test 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 equipercentile linking method because that data are directly connected to the OSTP spring data used in the study. The equipercentile 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., OSTP). Its equipercentile 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 OSTP on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on OSTP, 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 OSTP tests can be described using classification accuracy statistics based on the MAP Growth RIT spring cut scores that show the proportion of students correctly classified by their RIT scores as proficient (*Proficient* or *Advanced*) or not proficient (*Below Basic* or *Basic*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich, Hanson, Harris, & Sconing, 2004). The results are based on the Spring 2017 and Spring 2018 MAP Growth and OSTP data for the *Proficient* cut score.

Since Oklahoma students do not begin taking the OSTP assessment until Grade 3, longitudinal data were collected for the Grade 3 cohort in order to link the OSTP assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. To accomplish this, OSTP Grade 3 results were linked to MAP Growth data from Grade 3 students in 2016–2017 and 2017–2018 and Grade 2 students in 2015–2016 and 2016–2017, respectively. 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) / (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 OSTP 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 *Proficient* on the OSTP test based on their fall or winter RIT score:

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

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 *Proficient* 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 *Proficient* on the OSTP test based on their spring RIT score (RIT_{Spring}):

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

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 OSTP assessments in Spring 2017 and Spring 2018 were included in the study sample. Data used in this study were collected from six districts and 72 schools in Oklahoma. Table 3.1 presents the demographic distributions of race, sex, and performance level in the original unweighted study sample. Table 3.2 presents the distributions of the student population that took the Spring 2018 OSTP tests (Oklahoma State Department of Education, 2018). Since the unweighted data are different from the general OSTP 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 OSTP 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)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA/Reading							
	Total N	4,064	3,795	3,577	3,290	2,667	3,009
Race*	AI/AN	9.4	8.2	8.7	8.0	11.5	10.5
	Asian/PI	1.2	1.2	1.3	1.6	1.3	1.7
	Black	19.4	18.6	17.6	20.2	17.8	18.1
	Hispanic	30.2	30.2	31.1	29.4	24.5	26.0
	Multiethnic	7.2	7.9	7.2	6.1	6.2	5.6
	NH/PI	0.4	0.6	0.4	0.4	0.5	0.4
	White	32.3	33.2	33.7	34.3	38.2	37.7
Sex	Female	50.0	50.1	49.8	49.3	48.5	50.6
	Male	50.0	49.9	50.2	50.7	51.5	49.4
Performance Level	*Below Basic*	52.5	47.4	35.0	32.1	41.7	38.0
	Basic	26.6	30.3	38.0	41.0	34.9	38.6
	Proficient	17.2	17.7	18.4	21.1	17.5	16.7
	Advanced	3.7	4.6	8.6	5.7	5.9	6.8
Mathematics							
	Total N	4,056	3,793	3,544	3,310	2,664	3,065
Race*	AI/AN	9.4	8.2	8.8	8.1	11.4	10.2
	Asian/PI	1.2	1.2	1.4	1.6	1.2	1.7
	Black	19.2	18.7	17.4	20.0	18.0	18.4
	Hispanic	30.3	30.1	31.0	29.5	24.4	26.3
	Multiethnic	7.2	7.9	7.1	6.1	6.1	5.5
	NH/PI	0.4	0.6	0.5	0.4	0.5	0.4
	White	32.4	33.2	33.9	34.2	38.4	37.3
Sex	Female	50.0	50.0	49.8	49.3	48.6	50.0
	Male	50.0	50.0	50.2	50.7	51.4	50.0

Linking Study Sample (Unweighted)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
Performance Level	*Below Basic*	44.7	45.3	40.5	45.0	48.7	70.2
	Basic	31.6	34.8	40.9	36.3	27.2	18.2
	Proficient	16.8	14.0	12.8	16.2	19.0	6.1
	Advanced	6.9	6.0	5.8	2.6	5.1	5.4

*AI/AN = American Indian or Alaskan Native. NH/PI = Native Hawaiian or Other Pacific Islander.

Table 3.2. Spring 2018 OSTP Student Population Demographics

Spring 2018 OSTP Population							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA							
	Total N	52,343	51,227	51,090	49,233	46,689	48,056
Race*	AI/AN	13.0	12.7	13.1	13.8	14.2	14.4
	Asian/PI	1.9	1.9	2.0	2.0	1.9	2.2
	Black	8.9	8.4	8.5	8.7	8.2	8.6
	Hispanic	18.8	18.5	18.4	18.0	16.8	17.3
	Multiethnic	10.3	10.5	9.9	9.1	8.5	8.2
	NH/PI	0.4	0.4	0.3	0.4	0.3	0.3
	White	46.8	47.6	47.8	48.0	50.0	49.0
Sex	Female	48.7	49.2	49.1	49.5	48.9	48.7
	Male	51.3	50.8	50.9	50.5	51.1	51.3
Performance Level	*Below Basic*	34.0	30.0	22.0	22.0	32.0	24.0
	Basic	33.0	34.0	41.0	40.0	41.0	43.0
	Proficient	27.0	28.0	23.0	29.0	20.0	24.0
	Advanced	6.0	7.0	14.0	9.0	8.0	9.0
Mathematics							
	Total N	52,319	51,156	51,078	48,677	46,121	47,483
Race*	AI/AN	13.0	12.7	13.1	13.8	14.1	14.3
	Asian/PI	1.9	1.9	2.0	2.0	1.9	2.2
	Black	8.9	8.4	8.5	8.8	8.2	8.6
	Hispanic	18.8	18.5	18.4	17.9	16.7	17.2
	Multiethnic	10.3	10.5	9.9	9.2	8.5	8.3
	NH/PI	0.4	0.4	0.3	0.4	0.3	0.3
	White	46.8	47.7	47.7	48.1	50.1	49.1
Sex	Female	48.7	49.2	49.1	49.5	49.0	48.8
	Male	51.3	50.8	50.9	50.5	51.0	51.2
Performance Level	*Below Basic*	24.0	27.0	25.0	29.0	34.0	52.0
	Basic	35.0	37.0	45.0	43.0	32.0	28.0
	Proficient	26.0	25.0	20.0	23.0	26.0	10.0
	Advanced	15.0	11.0	10.0	5.0	8.0	10.0

*AI/AN = American Indian or Alaskan Native. NH/PI = Native Hawaiian or Other Pacific Islander.

Table 3.3. Linking Study Sample Demographics (Weighted)

Linking Study Sample (Weighted)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA/Reading							
	Total N	4,064	3,757	3,577	3,290	2,694	3,009
Race*	AI/AN	13.0	12.7	13.1	13.8	14.2	14.4
	Asian/PI	1.9	1.9	2.0	2.0	1.9	2.2
	Black	8.9	8.4	8.5	8.7	8.2	8.6
	Hispanic	18.8	18.5	18.4	18.0	16.8	17.3
	Multiethnic	10.3	10.5	9.9	9.1	8.5	8.2
	NH/PI	0.4	0.4	0.3	0.4	0.3	0.3
	White	46.8	47.6	47.8	48.0	50.1	49.0
Sex	Female	48.7	49.2	49.1	49.5	48.9	48.7
	Male	51.3	50.8	50.9	50.5	51.1	51.3
Performance Level	*Below Basic*	34.0	30.3	22.0	22.0	31.7	24.0
	Basic	33.0	34.3	41.0	40.0	40.6	43.0
	Proficient	27.0	28.3	23.0	29.0	19.8	24.0
	Advanced	6.0	7.1	14.0	9.0	7.9	9.0
Mathematics							
	Total N	4,056	3,793	3,544	3,310	2,664	3,065
Race*	AI/AN	13.0	12.7	13.1	13.8	14.1	14.3
	Asian/PI	1.9	1.9	2.0	2.0	1.9	2.2
	Black	8.9	8.4	8.5	8.8	8.2	8.6
	Hispanic	18.8	18.5	18.4	17.9	16.7	17.2
	Multiethnic	10.3	10.5	9.9	9.2	8.5	8.3
	NH/PI	0.4	0.4	0.3	0.4	0.3	0.3
	White	46.8	47.7	47.7	48.0	50.2	49.1
Sex	Female	48.7	49.2	49.1	49.5	49.0	48.8
	Male	51.3	50.8	50.9	50.5	51.0	51.2
Performance Level	*Below Basic*	24.0	27.0	25.0	29.0	34.0	52.0
	Basic	35.0	37.0	45.0	43.0	32.0	28.0
	Proficient	26.0	25.0	20.0	23.0	26.0	10.0
	Advanced	15.0	11.0	10.0	5.0	8.0	10.0

*AI/AN = American Indian or Alaskan Native. NH/PI = Native Hawaiian or Other Pacific Islander.

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and OSTP test scores from Spring 2017 and Spring 2018, including the correlation coefficient (*r*) between them. The correlation coefficients between the scores range from 0.81 to 0.83 for ELA and 0.82 to 0.85 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 OSTP assessments.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	*r*	OSTP*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	4,064	0.82	284.7	31.2	202	394	197.2	17.1	142	240
4	3,757	0.83	287.0	30.6	200	389	205.1	16.4	145	255
5	3,577	0.82	290.2	30.6	200	399	211.0	15.4	144	254
6	3,290	0.81	289.5	30.5	201	399	214.6	15.9	149	259
7	2,694	0.81	283.4	31.0	201	399	217.9	17.0	151	262
8	3,009	0.81	285.0	30.8	201	399	220.9	16.5	144	261
Mathematics										
3	4,056	0.83	291.4	30.2	201	399	201.1	14.2	139	258
4	3,793	0.83	288.0	30.1	200	399	209.3	14.2	143	258
5	3,544	0.85	283.3	30.8	203	399	217.1	16.2	146	267
6	3,310	0.85	281.4	30.7	201	373	221.1	16.3	148	262
7	2,664	0.82	286.0	31.7	207	399	227.0	18.3	146	285
8	3,065	0.83	271.9	34.4	202	399	230.3	19.6	146	286

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

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the OSTP 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 OSTP 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 197 in the fall is likely to reach *Proficient* on the OSTP ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 206 in the spring is also likely to reach *Proficient* on the OSTP. 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

OSTP ELA				
Grade	***Below Basic***	***Basic***	***Proficient***	***Advanced***
3	200–276	277–299	**300**–328	329–399
4	200–274	275–299	**300**–330	331–399
5	200–270	271–299	**300**–322	323–399
6	200–268	269–299	**300**–329	330–399
7	200–272	273–299	**300**–322	323–399
8	200–268	269–299	**300**–321	322–399

MAP Growth Reading*								
	Below Basic		***Basic***		***Proficient***		***Advanced***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–167	1–38	168–183	39–77	**184**–202	78–97	203–350	98–99
3	100–182	1–40	183–196	41–72	**197**–212	73–93	213–350	94–99
4	100–190	1–36	191–204	37–68	**205**–221	69–92	222–350	93–99
5	100–194	1–27	195–209	28–62	**210**–223	63–87	224–350	88–99
6	100–198	1–24	199–216	25–65	**217**–229	66–88	230–350	89–99
7	100–209	1–39	210–223	40–71	**224**–234	72–89	235–350	90–99
8	100–211	1–35	212–224	36–65	**225**–236	66–86	237–350	87–99
Winter								
2	100–176	1–38	177–191	39–75	**192**–209	76–96	210–350	97–99
3	100–190	1–42	191–202	43–70	**203**–217	71–92	218–350	93–99
4	100–196	1–36	197–209	37–67	**210**–225	68–92	226–350	93–99
5	100–200	1–29	201–213	30–61	**214**–226	62–86	227–350	87–99
6	100–203	1–26	204–219	27–64	**220**–231	65–86	232–350	87–99
7	100–213	1–41	214–225	42–70	**226**–235	71–87	236–350	88–99
8	100–214	1–36	215–226	37–64	**227**–237	65–84	238–350	85–99
Spring								
2	100–181	1–40	182–195	41–74	**196**–212	75–95	213–350	96–99
3	100–193	1–41	194–205	42–70	**206**–219	71–91	220–350	92–99
4	100–199	1–37	200–211	38–66	**212**–226	67–90	227–350	91–99
5	100–202	1–30	203–215	31–61	**216**–227	62–85	228–350	86–99
6	100–205	1–27	206–220	28–63	**221**–232	64–85	233–350	86–99
7	100–214	1–41	215–226	42–69	**227**–236	70–86	237–350	87–99
8	100–215	1–36	216–227	37–64	**228**–238	65–84	239–350	85–99

*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

OSTP Mathematics				
Grade	***Below Basic***	***Basic***	***Proficient***	***Advanced***
3	200–273	274–299	**300**–320	321–399
4	200–272	273–299	**300**–321	322–399
5	200–265	266–299	**300**–320	321–399
6	200–266	267–299	**300**–329	330–399
7	200–278	279–299	**300**–328	329–399
8	200–276	277–299	**300**–315	316–399

MAP Growth Mathematics*								
	Below Basic		***Basic***		***Proficient***		***Advanced***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–166	1–26	167–180	27–67	**181**–190	68–88	191–350	89–99
3	100–180	1–28	181–193	29–65	**194**–201	66–83	202–350	84–99
4	100–191	1–29	192–203	30–61	**204**–213	62–83	214–350	84–99
5	100–198	1–24	199–214	25–64	**215**–225	65–86	226–350	87–99
6	100–205	1–28	206–222	29–69	**223**–237	70–92	238–350	93–99
7	100–216	1–42	217–227	43–66	**228**–242	67–89	243–350	90–99
8	100–228	1–58	229–239	59–78	**240**–248	79–89	249–350	90–99
Winter								
2	100–175	1–26	176–189	27–67	**190**–198	68–86	199–350	87–99
3	100–188	1–29	189–200	30–63	**201**–208	64–82	209–350	83–99
4	100–198	1–31	199–210	32–62	**211**–220	63–83	221–350	84–99
5	100–204	1–26	205–220	27–64	**221**–231	65–85	232–350	86–99
6	100–210	1–29	211–227	30–68	**228**–242	69–91	243–350	92–99
7	100–220	1–42	221–231	43–66	**232**–246	67–89	247–350	90–99
8	100–231	1–57	232–242	58–77	**243**–251	78–88	252–350	89–99
Spring								
2	100–181	1–28	182–194	29–65	**195**–203	66–85	204–350	86–99
3	100–193	1–30	194–205	31–63	**206**–213	64–81	214–350	82–99
4	100–202	1–30	203–214	31–60	**215**–224	61–81	225–350	82–99
5	100–208	1–27	209–224	28–64	**225**–235	65–84	236–350	85–99
6	100–213	1–30	214–230	31–67	**231**–245	68–90	246–350	91–99
7	100–223	1–43	224–234	44–66	**235**–249	67–88	250–350	89–99
8	100–233	1–56	234–244	57–76	**245**–253	77–87	254–350	88–99

*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 OSTP tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.82 to 0.89 for ELA/Reading and 0.84 to 0.90 for Mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the OSTP assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on OSTP 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 OSTP tests, there is a notable limitation to how these results should be used and interpreted. OSTP 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	Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	Precision	AUC*
		MAP Growth	OSTP		FP	FN				
ELA/Reading										
2	2,673	196	300	0.89	0.04	0.46	0.54	0.96	0.74	0.91
3	4,064	206	300	0.82	0.15	0.24	0.76	0.85	0.71	0.89
4	3,757	212	300	0.83	0.16	0.19	0.81	0.84	0.74	0.91
5	3,577	216	300	0.83	0.18	0.16	0.84	0.82	0.73	0.91
6	3,290	221	300	0.83	0.14	0.22	0.78	0.86	0.77	0.91
7	2,694	227	300	0.83	0.15	0.25	0.75	0.85	0.66	0.90
8	3,009	228	300	0.83	0.16	0.18	0.82	0.84	0.71	0.91
Mathematics										
2	2,517	195	300	0.87	0.10	0.27	0.73	0.90	0.64	0.92
3	4,056	206	300	0.84	0.16	0.16	0.84	0.84	0.79	0.92
4	3,793	215	300	0.85	0.14	0.17	0.83	0.86	0.77	0.92
5	3,544	225	300	0.88	0.11	0.14	0.86	0.89	0.77	0.95
6	3,310	231	300	0.87	0.10	0.22	0.78	0.90	0.76	0.93
7	2,664	235	300	0.87	0.11	0.17	0.83	0.89	0.80	0.95
8	3,065	245	300	0.90	0.09	0.16	0.84	0.91	0.71	0.96

*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 *Proficient* performance on the OSTP test based on RIT scores from fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 204 in the fall has a 79% chance of reaching *Proficient* proficiency or higher on the OSTP test. "Prob." indicates the probability of obtaining proficient status on the OSTP test in the spring.

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

ELA/Reading											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.
2	5	196	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	196	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	196	157	No	<0.01	166	No	<0.01	170	No	<0.01
	20	196	160	No	<0.01	169	No	<0.01	173	No	<0.01
	25	196	162	No	<0.01	171	No	<0.01	175	No	<0.01
	30	196	164	No	0.01	173	No	<0.01	177	No	<0.01
	35	196	166	No	0.02	175	No	<0.01	180	No	<0.01
	40	196	168	No	0.03	177	No	<0.01	182	No	<0.01
	45	196	170	No	0.04	179	No	0.01	184	No	<0.01
	50	196	172	No	0.07	181	No	0.02	186	No	<0.01
	55	196	174	No	0.12	183	No	0.05	188	No	0.01
	60	196	176	No	0.18	185	No	0.10	189	No	0.01
	65	196	178	No	0.25	187	No	0.17	192	No	0.11
	70	196	180	No	0.30	189	No	0.29	194	No	0.27
	75	196	183	No	0.45	191	No	0.43	196	Yes	0.50
	80	196	185	Yes	0.55	194	Yes	0.65	199	Yes	0.83
	85	196	188	Yes	0.65	197	Yes	0.83	202	Yes	0.97
	90	196	192	Yes	0.82	200	Yes	0.93	205	Yes	>0.99
	95	196	197	Yes	0.93	206	Yes	>0.99	211	Yes	>0.99

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
3	5	206	159	No	<0.01	167	No	<0.01	170	No	<0.01	
	10	206	165	No	<0.01	173	No	<0.01	176	No	<0.01	
	15	206	169	No	<0.01	177	No	<0.01	180	No	<0.01	
	20	206	173	No	<0.01	180	No	<0.01	183	No	<0.01	
	25	206	175	No	0.01	183	No	<0.01	186	No	<0.01	
	30	206	178	No	0.02	185	No	<0.01	189	No	<0.01	
	35	206	180	No	0.02	188	No	<0.01	191	No	<0.01	
	40	206	182	No	0.04	190	No	0.01	193	No	<0.01	
	45	206	185	No	0.09	192	No	0.02	195	No	<0.01	
	50	206	187	No	0.11	194	No	0.05	197	No	<0.01	
	55	206	189	No	0.17	196	No	0.09	199	No	0.01	
	60	206	191	No	0.25	198	No	0.17	201	No	0.06	
	65	206	193	No	0.34	200	No	0.29	203	No	0.17	
	70	206	195	No	0.39	202	No	0.43	206	Yes	0.50	
	75	206	198	Yes	0.55	205	Yes	0.65	208	Yes	0.73	
	80	206	201	Yes	0.70	207	Yes	0.77	211	Yes	0.94	
	85	206	204	Yes	0.79	211	Yes	0.91	214	Yes	0.99	
	90	206	208	Yes	0.91	215	Yes	0.98	218	Yes	>0.99	
	95	206	214	Yes	0.98	220	Yes	>0.99	224	Yes	>0.99	
4	5	212	169	No	<0.01	176	No	<0.01	178	No	<0.01	
	10	212	175	No	<0.01	182	No	<0.01	184	No	<0.01	
	15	212	179	No	<0.01	186	No	<0.01	188	No	<0.01	
	20	212	183	No	<0.01	189	No	<0.01	191	No	<0.01	
	25	212	185	No	0.01	192	No	<0.01	194	No	<0.01	
	30	212	188	No	0.02	194	No	<0.01	196	No	<0.01	
	35	212	190	No	0.04	196	No	0.01	199	No	<0.01	
	40	212	192	No	0.06	198	No	0.02	201	No	<0.01	
	45	212	195	No	0.11	200	No	0.03	203	No	<0.01	
	50	212	197	No	0.17	202	No	0.06	205	No	0.01	
	55	212	199	No	0.24	205	No	0.17	207	No	0.06	
	60	212	201	No	0.34	207	No	0.28	209	No	0.17	
	65	212	203	No	0.39	209	No	0.42	211	No	0.38	
	70	212	205	Yes	0.50	211	Yes	0.58	213	Yes	0.62	
	75	212	208	Yes	0.66	213	Yes	0.72	216	Yes	0.89	
	80	212	211	Yes	0.76	216	Yes	0.87	219	Yes	0.99	
	85	212	214	Yes	0.87	219	Yes	0.96	222	Yes	>0.99	
	90	212	218	Yes	0.94	223	Yes	0.99	226	Yes	>0.99	
	95	212	224	Yes	0.99	229	Yes	>0.99	232	Yes	>0.99	

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
5	5	216	178	No	<0.01	183	No	<0.01	185	No	<0.01	
	10	216	183	No	<0.01	189	No	<0.01	191	No	<0.01	
	15	216	187	No	<0.01	193	No	<0.01	194	No	<0.01	
	20	216	191	No	0.01	196	No	<0.01	198	No	<0.01	
	25	216	193	No	0.02	198	No	<0.01	200	No	<0.01	
	30	216	196	No	0.05	201	No	0.01	203	No	<0.01	
	35	216	198	No	0.06	203	No	0.02	205	No	<0.01	
	40	216	200	No	0.11	205	No	0.04	207	No	<0.01	
	45	216	202	No	0.17	207	No	0.09	209	No	0.01	
	50	216	204	No	0.24	209	No	0.17	211	No	0.06	
	55	216	207	No	0.34	211	No	0.28	213	No	0.17	
	60	216	209	No	0.44	213	No	0.42	215	No	0.38	
	65	216	211	Yes	0.56	215	Yes	0.58	217	Yes	0.62	
	70	216	213	Yes	0.61	217	Yes	0.65	219	Yes	0.83	
	75	216	216	Yes	0.76	220	Yes	0.83	222	Yes	0.97	
	80	216	218	Yes	0.83	222	Yes	0.91	224	Yes	0.99	
	85	216	221	Yes	0.89	226	Yes	0.98	228	Yes	>0.99	
	90	216	225	Yes	0.96	229	Yes	>0.99	231	Yes	>0.99	
	95	216	231	Yes	0.99	235	Yes	>0.99	237	Yes	>0.99	
6	5	221	183	No	<0.01	188	No	<0.01	189	No	<0.01	
	10	221	189	No	<0.01	193	No	<0.01	195	No	<0.01	
	15	221	193	No	<0.01	197	No	<0.01	199	No	<0.01	
	20	221	196	No	<0.01	200	No	<0.01	202	No	<0.01	
	25	221	199	No	0.02	203	No	<0.01	205	No	<0.01	
	30	221	202	No	0.03	205	No	<0.01	207	No	<0.01	
	35	221	204	No	0.06	208	No	0.02	209	No	<0.01	
	40	221	206	No	0.10	210	No	0.04	211	No	<0.01	
	45	221	208	No	0.13	212	No	0.09	213	No	0.01	
	50	221	210	No	0.19	214	No	0.17	215	No	0.03	
	55	221	212	No	0.28	216	No	0.22	217	No	0.11	
	60	221	214	No	0.39	218	No	0.35	219	No	0.27	
	65	221	217	Yes	0.50	220	Yes	0.50	222	Yes	0.62	
	70	221	219	Yes	0.61	222	Yes	0.65	224	Yes	0.83	
	75	221	221	Yes	0.72	225	Yes	0.83	226	Yes	0.94	
	80	221	224	Yes	0.81	227	Yes	0.91	229	Yes	0.99	
	85	221	227	Yes	0.90	230	Yes	0.97	232	Yes	>0.99	
	90	221	231	Yes	0.97	234	Yes	>0.99	236	Yes	>0.99	
	95	221	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99	

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
7	5	227	187	No	<0.01	190	No	<0.01	191	No	<0.01	
	10	227	193	No	<0.01	196	No	<0.01	197	No	<0.01	
	15	227	197	No	<0.01	200	No	<0.01	201	No	<0.01	
	20	227	200	No	<0.01	203	No	<0.01	205	No	<0.01	
	25	227	203	No	<0.01	206	No	<0.01	207	No	<0.01	
	30	227	206	No	0.01	209	No	<0.01	210	No	<0.01	
	35	227	208	No	0.02	211	No	<0.01	212	No	<0.01	
	40	227	210	No	0.04	213	No	0.01	214	No	<0.01	
	45	227	212	No	0.06	215	No	0.02	216	No	<0.01	
	50	227	214	No	0.10	217	No	0.04	218	No	<0.01	
	55	227	216	No	0.16	219	No	0.09	220	No	0.01	
	60	227	218	No	0.24	221	No	0.17	223	No	0.11	
	65	227	221	No	0.33	223	No	0.28	225	No	0.27	
	70	227	223	No	0.44	226	Yes	0.50	227	Yes	0.50	
	75	227	225	Yes	0.56	228	Yes	0.65	229	Yes	0.73	
	80	227	228	Yes	0.72	231	Yes	0.83	232	Yes	0.94	
	85	227	231	Yes	0.81	234	Yes	0.94	235	Yes	0.99	
	90	227	235	Yes	0.92	238	Yes	0.99	239	Yes	>0.99	
	95	227	241	Yes	0.99	244	Yes	>0.99	245	Yes	>0.99	
8	5	228	190	No	<0.01	193	No	<0.01	194	No	<0.01	
	10	228	196	No	<0.01	199	No	<0.01	200	No	<0.01	
	15	228	200	No	<0.01	203	No	<0.01	204	No	<0.01	
	20	228	204	No	<0.01	206	No	<0.01	207	No	<0.01	
	25	228	207	No	0.01	209	No	<0.01	210	No	<0.01	
	30	228	209	No	0.03	212	No	<0.01	213	No	<0.01	
	35	228	211	No	0.04	214	No	0.01	215	No	<0.01	
	40	228	214	No	0.08	216	No	0.02	217	No	<0.01	
	45	228	216	No	0.13	218	No	0.04	220	No	0.01	
	50	228	218	No	0.20	221	No	0.13	222	No	0.03	
	55	228	220	No	0.24	223	No	0.22	224	No	0.11	
	60	228	222	No	0.34	225	No	0.35	226	No	0.27	
	65	228	225	Yes	0.50	227	Yes	0.50	228	Yes	0.50	
	70	228	227	Yes	0.61	229	Yes	0.65	231	Yes	0.83	
	75	228	230	Yes	0.71	232	Yes	0.83	233	Yes	0.94	
	80	228	232	Yes	0.80	235	Yes	0.94	236	Yes	0.99	
	85	228	236	Yes	0.92	238	Yes	0.98	239	Yes	>0.99	
	90	228	240	Yes	0.97	242	Yes	>0.99	243	Yes	>0.99	
	95	228	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

Table 3.9. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
			Fall			Winter			Spring		
				Projected Proficiency			Projected Proficiency			Projected Proficiency	
Grade	Start %ile	Spring Cut	Fall RIT	*Proficient*	Prob.	Winter RIT	*Proficient*	Prob.	Spring RIT	*Proficient*	Prob.
2	5	195	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	195	158	No	<0.01	167	No	<0.01	172	No	<0.01
	15	195	162	No	<0.01	171	No	<0.01	175	No	<0.01
	20	195	164	No	0.01	173	No	<0.01	178	No	<0.01
	25	195	166	No	0.01	175	No	<0.01	180	No	<0.01
	30	195	168	No	0.03	177	No	0.01	182	No	<0.01
	35	195	170	No	0.06	179	No	0.02	184	No	<0.01
	40	195	172	No	0.11	181	No	0.03	186	No	<0.01
	45	195	173	No	0.14	182	No	0.05	188	No	0.01
	50	195	175	No	0.18	184	No	0.10	189	No	0.02
	55	195	177	No	0.27	186	No	0.20	191	No	0.08
	60	195	178	No	0.32	187	No	0.26	193	No	0.25
	65	195	180	No	0.44	189	No	0.42	195	Yes	0.50
	70	195	182	Yes	0.56	191	Yes	0.58	196	Yes	0.63
	75	195	184	Yes	0.68	193	Yes	0.74	198	Yes	0.85
	80	195	186	Yes	0.73	195	Yes	0.85	201	Yes	0.98
	85	195	188	Yes	0.82	198	Yes	0.95	203	Yes	>0.99
	90	195	192	Yes	0.94	201	Yes	0.99	207	Yes	>0.99
	95	195	196	Yes	0.98	205	Yes	>0.99	212	Yes	>0.99
3	5	206	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	206	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	206	175	No	<0.01	182	No	<0.01	186	No	<0.01
	20	206	177	No	<0.01	185	No	<0.01	189	No	<0.01
	25	206	179	No	0.01	187	No	<0.01	192	No	<0.01
	30	206	181	No	0.03	189	No	0.01	194	No	<0.01
	35	206	183	No	0.05	191	No	0.02	196	No	<0.01
	40	206	185	No	0.10	193	No	0.04	198	No	<0.01
	45	206	187	No	0.17	195	No	0.10	199	No	0.01
	50	206	188	No	0.21	196	No	0.14	201	No	0.04
	55	206	190	No	0.31	198	No	0.26	203	No	0.15
	60	206	192	No	0.37	200	No	0.42	205	No	0.37
	65	206	194	Yes	0.50	201	Yes	0.50	207	Yes	0.63
	70	206	196	Yes	0.63	203	Yes	0.67	208	Yes	0.75
	75	206	198	Yes	0.74	205	Yes	0.80	211	Yes	0.96
	80	206	200	Yes	0.83	208	Yes	0.93	213	Yes	0.99
	85	206	202	Yes	0.90	210	Yes	0.97	216	Yes	>0.99
	90	206	206	Yes	0.97	214	Yes	0.99	219	Yes	>0.99
	95	206	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99

Mathematics											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.
4	5	215	176	No	<0.01	182	No	<0.01	185	No	<0.01
	10	215	181	No	<0.01	187	No	<0.01	191	No	<0.01
	15	215	185	No	<0.01	191	No	<0.01	194	No	<0.01
	20	215	187	No	<0.01	194	No	<0.01	197	No	<0.01
	25	215	190	No	0.01	196	No	<0.01	200	No	<0.01
	30	215	192	No	0.03	198	No	<0.01	202	No	<0.01
	35	215	194	No	0.05	200	No	0.01	205	No	<0.01
	40	215	196	No	0.10	202	No	0.03	207	No	<0.01
	45	215	198	No	0.17	204	No	0.07	209	No	0.02
	50	215	200	No	0.26	206	No	0.14	211	No	0.08
	55	215	201	No	0.32	208	No	0.26	212	No	0.15
	60	215	203	No	0.44	210	No	0.42	214	No	0.37
	65	215	205	Yes	0.56	212	Yes	0.58	217	Yes	0.75
	70	215	207	Yes	0.68	214	Yes	0.74	219	Yes	0.92
	75	215	209	Yes	0.79	216	Yes	0.86	221	Yes	0.98
	80	215	212	Yes	0.90	219	Yes	0.96	224	Yes	>0.99
	85	215	214	Yes	0.95	221	Yes	0.98	227	Yes	>0.99
	90	215	218	Yes	0.99	225	Yes	>0.99	230	Yes	>0.99
	95	215	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99
5	5	225	184	No	<0.01	189	No	<0.01	191	No	<0.01
	10	225	190	No	<0.01	194	No	<0.01	197	No	<0.01
	15	225	193	No	<0.01	198	No	<0.01	201	No	<0.01
	20	225	196	No	<0.01	201	No	<0.01	205	No	<0.01
	25	225	199	No	<0.01	204	No	<0.01	207	No	<0.01
	30	225	201	No	0.02	206	No	<0.01	210	No	<0.01
	35	225	203	No	0.03	209	No	0.01	212	No	<0.01
	40	225	205	No	0.06	211	No	0.02	215	No	<0.01
	45	225	207	No	0.11	213	No	0.05	217	No	<0.01
	50	225	209	No	0.18	215	No	0.10	219	No	0.02
	55	225	211	No	0.27	217	No	0.20	221	No	0.08
	60	225	213	No	0.38	219	No	0.34	223	No	0.25
	65	225	215	Yes	0.50	221	Yes	0.50	225	Yes	0.50
	70	225	217	Yes	0.62	223	Yes	0.66	228	Yes	0.85
	75	225	219	Yes	0.73	225	Yes	0.80	230	Yes	0.96
	80	225	222	Yes	0.86	228	Yes	0.93	233	Yes	>0.99
	85	225	225	Yes	0.94	231	Yes	0.98	236	Yes	>0.99
	90	225	229	Yes	0.98	235	Yes	>0.99	240	Yes	>0.99
	95	225	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
6	5	231	188	No	<0.01	192	No	<0.01	194	No	<0.01	
	10	231	194	No	<0.01	198	No	<0.01	200	No	<0.01	
	15	231	198	No	<0.01	202	No	<0.01	205	No	<0.01	
	20	231	201	No	<0.01	205	No	<0.01	208	No	<0.01	
	25	231	204	No	<0.01	208	No	<0.01	211	No	<0.01	
	30	231	206	No	<0.01	211	No	<0.01	214	No	<0.01	
	35	231	209	No	0.01	213	No	<0.01	216	No	<0.01	
	40	231	211	No	0.03	215	No	<0.01	218	No	<0.01	
	45	231	213	No	0.06	217	No	0.01	221	No	<0.01	
	50	231	215	No	0.10	220	No	0.04	223	No	<0.01	
	55	231	217	No	0.17	222	No	0.10	225	No	0.02	
	60	231	219	No	0.27	224	No	0.20	227	No	0.08	
	65	231	221	No	0.38	226	No	0.34	230	No	0.37	
	70	231	223	Yes	0.50	228	Yes	0.50	232	Yes	0.63	
	75	231	226	Yes	0.68	231	Yes	0.74	235	Yes	0.92	
	80	231	228	Yes	0.78	234	Yes	0.90	238	Yes	0.99	
	85	231	231	Yes	0.90	237	Yes	0.97	241	Yes	>0.99	
	90	231	235	Yes	0.97	241	Yes	>0.99	245	Yes	>0.99	
	95	231	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	
7	5	235	192	No	<0.01	194	No	<0.01	196	No	<0.01	
	10	235	198	No	<0.01	201	No	<0.01	203	No	<0.01	
	15	235	202	No	<0.01	205	No	<0.01	207	No	<0.01	
	20	235	206	No	<0.01	209	No	<0.01	211	No	<0.01	
	25	235	208	No	<0.01	212	No	<0.01	214	No	<0.01	
	30	235	211	No	<0.01	215	No	<0.01	217	No	<0.01	
	35	235	213	No	<0.01	217	No	<0.01	220	No	<0.01	
	40	235	216	No	0.02	219	No	<0.01	222	No	<0.01	
	45	235	218	No	0.05	222	No	0.02	224	No	<0.01	
	50	235	220	No	0.10	224	No	0.04	227	No	<0.01	
	55	235	222	No	0.17	226	No	0.10	229	No	0.02	
	60	235	225	No	0.31	229	No	0.26	231	No	0.08	
	65	235	227	No	0.44	231	No	0.42	234	No	0.37	
	70	235	229	Yes	0.56	233	Yes	0.58	236	Yes	0.63	
	75	235	232	Yes	0.74	236	Yes	0.80	239	Yes	0.92	
	80	235	235	Yes	0.87	239	Yes	0.93	242	Yes	0.99	
	85	235	238	Yes	0.95	243	Yes	0.99	246	Yes	>0.99	
	90	235	243	Yes	0.99	247	Yes	>0.99	251	Yes	>0.99	
	95	235	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.
8	5	245	194	No	<0.01	196	No	<0.01	197	No	<0.01
	10	245	201	No	<0.01	203	No	<0.01	205	No	<0.01
	15	245	205	No	<0.01	208	No	<0.01	210	No	<0.01
	20	245	209	No	<0.01	212	No	<0.01	214	No	<0.01
	25	245	212	No	<0.01	215	No	<0.01	217	No	<0.01
	30	245	215	No	<0.01	218	No	<0.01	220	No	<0.01
	35	245	218	No	<0.01	221	No	<0.01	223	No	<0.01
	40	245	220	No	<0.01	223	No	<0.01	225	No	<0.01
	45	245	223	No	0.01	226	No	<0.01	228	No	<0.01
	50	245	225	No	0.02	228	No	<0.01	230	No	<0.01
	55	245	227	No	0.03	231	No	0.01	233	No	<0.01
	60	245	230	No	0.07	233	No	0.02	235	No	<0.01
	65	245	232	No	0.12	236	No	0.07	238	No	0.01
	70	245	235	No	0.24	238	No	0.15	241	No	0.08
	75	245	238	No	0.39	241	No	0.34	244	No	0.37
	80	245	241	Yes	0.56	244	Yes	0.58	247	Yes	0.75
	85	245	245	Yes	0.76	248	Yes	0.85	251	Yes	0.98
	90	245	249	Yes	0.90	253	Yes	0.98	256	Yes	>0.99
	95	245	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.

Oklahoma State Department of Education. (2018, December). *Oklahoma School Testing Program grades 3–8 2017-18 technical report*. Dover, NH: Measured Progress.

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.