Linking Study Report: Predicting Performance on the Oregon Smarter Balanced Summative Assessments based on NWEA MAP Growth Scores

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NWEA Psychometric Solutions

nwea

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Executive Summary

To predict student achievement on the Oregon Smarter Balanced Assessment Consortium (OR SBAC) summative assessments in Grades 3–8 English Language Arts/Literacy (ELA) and Mathematics, NWEA® conducted a linking study using Spring 2019 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the OR SBAC achievement 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.[1] The linking study has been updated since the previous SBAC version published in June 2017 based on multiple states' data to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020) and to report the results for Oregon only.

Table E.1 presents the OR SBAC *Level 3* achievement 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 3* cut score on the OR SBAC Grade 3 ELA test is 2432. A Grade 3 student with a MAP Growth Reading RIT score of 192 in the fall is likely to meet proficiency on the OR SBAC ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 192 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 OR SBAC 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 OR SBAC Proficiency

Assessment		*Level 3* Cut Scores by Grade						
		2	3	4	5	6	7	8
ELA/Reading								
OR SBAC Spring		–	2432	2473	2502	2531	2552	2567
MAP Growth	Fall	180	192	201	207	213	216	221
	Winter	188	199	207	211	217	219	223
	Spring	192	202	209	213	218	220	224
Mathematics								
OR SBAC Spring		–	2436	2485	2528	2552	2567	2586
MAP Growth	Fall	178	190	203	215	220	226	235
	Winter	187	198	210	221	225	230	238
	Spring	192	203	214	225	228	233	240

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 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 the specific instructional weeks set by partners.

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[1] This study provides MAP Growth cut scores that predict proficiency on the OR SBAC for Grades 2–8 only. They represent a higher level of achievement than universal screening cut scores designed to identify students with the most severe learning difficulties who may need intensive intervention. MAP Growth universal screening cut scores for Grades K–8 are available in a separate report (He & Meyer, 2021).

E.1. Assessment Overview

The OR SBAC Grades 3–8 ELA and Mathematics tests are Oregon's state summative assessments aligned to the Oregon State Standards. Based on their test scores, students are placed into one of four achievement levels: *Level 1*, *Level 2*, *Level 3*, and *Level 4*. The *Level 3* cut score demarks the minimum level of achievement considered to be proficient for accountability purposes. 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 2019 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring OR SBAC achievement 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 OR SBAC test were then projected using the 2020 NWEA conditional growth norms that provide expected score gains across test administrations.

E.3. Student Sample

Only students who took both the MAP Growth and OR SBAC assessments in Spring 2019 were included in the study sample. Table E.2 presents the weighted number of Oregon students from four districts and 76 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 achievement 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	1,964	3,381
4	2,003	3,465
5	1,817	3,348
6	1,322	3,272
7	1,253	2,877
8	1,057	2,623

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and OR SBAC scores range from 0.83 to 0.91 across 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 OR SBAC summative assessments.

Figure E.1. Correlations between MAP Growth and OR SBAC Test Scores
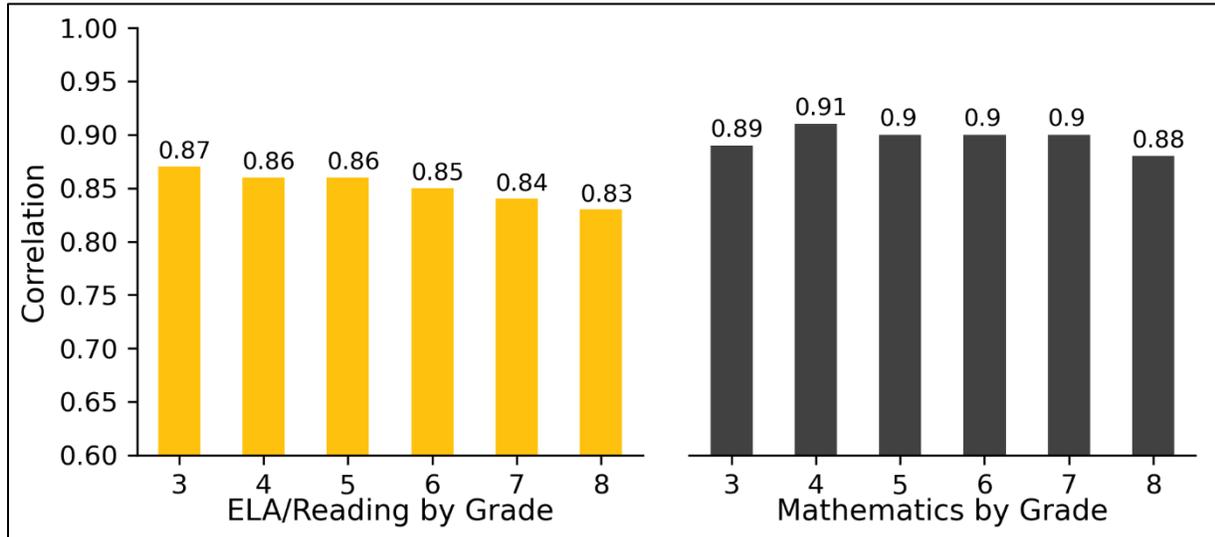
E.5. Accuracy of MAP Growth Classifications

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 OR SBAC summative tests. For example, the MAP Growth Reading Grade 3 *Level 3* cut score has a 0.85 accuracy rate, meaning it accurately classified student achievement on the state test for 85% of the sample. The results range from 0.83 to 0.89 across content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the OR SBAC summative tests.

Figure E.2. Accuracy of MAP Growth Classifications
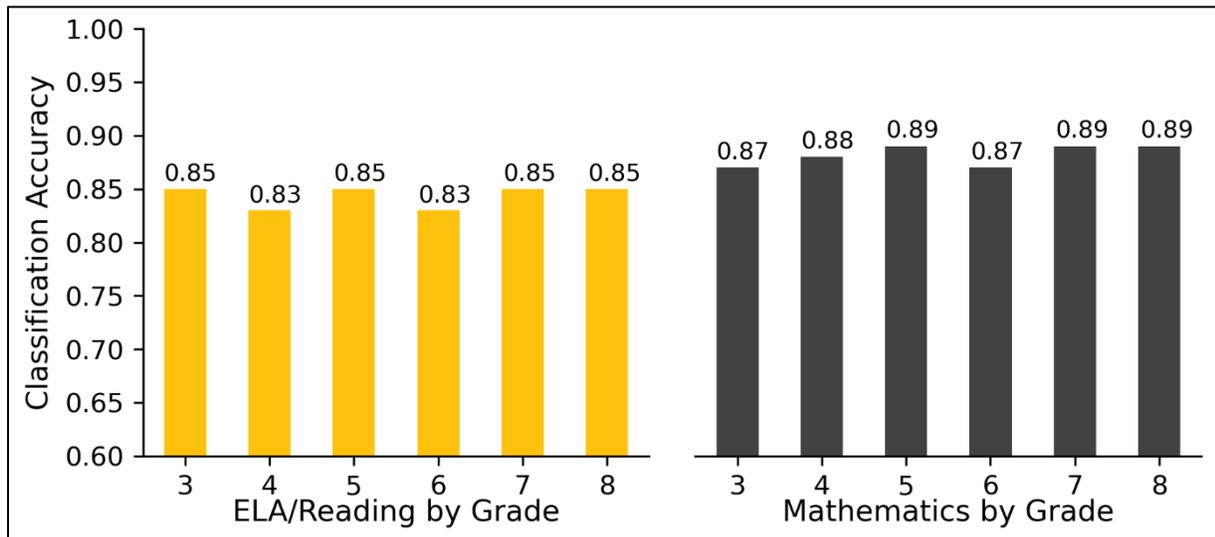
1. Introduction

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 March 2021 to statistically connect the scores of the Oregon Smarter Balanced Assessment Consortium (OR SBAC) Grades 3–8 English Language Arts/Literacy (ELA) and Mathematics assessments with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2019 term. The linking study has been updated since the previous SBAC version published in June 2017 based on multiple states' data to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020) and to report the results for Oregon only. 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 OR SBAC summative 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 OR SBAC achievement 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 OR SBAC summative tests
5. The probability of achieving grade-level proficiency on the OR SBAC assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The OR SBAC Grades 3–8 ELA and Mathematics summative assessments are aligned to the Oregon State 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 achievement level) that distinguish between the following achievement levels: *Level 1*, *Level 2*, *Level 3*, and *Level 4*. The *Level 3* 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 2019 administrations of the MAP Growth and OR SBAC assessments. NWEA recruited Oregon 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 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 OR SBAC assessments in Spring 2019 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 achievement 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 achievement 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 OR SBAC achievement 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 OR SBAC summative 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 compared to peers nationwide and (2) the relative rigor of a state's achievement 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 OR SBAC 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., OR SBAC). 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:

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

where $e_y(x)$ is the equipercentile equivalent of score x on OR SBAC on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on OR SBAC, 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:

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

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 OR SBAC tests can be described using classification accuracy statistics based on the MAP Growth spring RIT cut scores that show the proportion of students correctly classified by their RIT scores as proficient (*Level 3* or *Level 4*) or not proficient (*Level 1* or *Level 2*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich et al., 2004). The results are based on the Spring 2019 MAP Growth and OR SBAC data for the *Level 3* cut score.

Because students generally do not begin taking their state summative assessment until Grade 3, longitudinal data are normally collected for the Grade 3 cohort to link the state summative assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. However, classification accuracy statistics could not be calculated for Grade 2 for this linking study because of a lack of matched cases between Grade 2 and Grade 3 OR SBAC and MAP Growth data.

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 OR SBAC summative 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 3* performance on the OR SBAC summative test based on their fall or winter RIT score:

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

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 *Level 3* 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 3* performance on the OR SBAC summative test based on their spring RIT score (RIT_{Spring}):

$$Pr(Achieving\ Level\ 3\ in\ spring\ |\ spring\ RIT) = \Phi\left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE}\right) \quad (4)$$

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 OR SBAC assessments in Spring 2019 were included in the study sample. Data used in this study were collected from four districts and 76 schools in Oregon. Table 3.1 presents the demographic distributions of race, sex, and achievement level in the original unweighted study sample. Table 3.2 presents the distributions of the student population that took the Spring 2019 OR SBAC summative assessments. Since the unweighted data are different from the general OR SBAC 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 OR SBAC 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	1,964	2,003	1,817	1,322	1,253	1,057
AI/AN	2.8	2.8	2.8	4.1	5.5	4.8
Asian	5.8	5.5	5.9	5.6	5.5	5.6
Black	9.3	11.3	9.1	10.4	10.0	8.6
Race* Hispanic	17.4	17.2	18.2	21.3	18.7	21.7
Multi-Race	10.8	10.4	11.7	9.4	11.3	9.6
Pacific Islander	1.0	0.5	0.8	0.7	0.7	0.9
White	52.9	52.2	51.6	48.6	48.3	48.8
Sex Female	49.4	50.3	50.4	49.3	48.3	49.7
Male	50.6	49.7	49.6	50.7	51.7	50.3
Achievement Level *Level 1*	27.0	33.0	25.8	29.3	27.4	26.2
Level 2	20.2	15.3	15.8	24.4	20.2	22.5
Level 3	22.0	20.8	28.5	29.4	30.2	30.1
Level 4	30.8	30.9	29.9	16.9	22.2	21.2
Mathematics						
Total N	3,381	3,465	3,348	3,272	2,877	2,623
AI/AN	1.9	1.7	1.9	2.0	2.6	2.3
Asian	6.7	6.5	7.0	7.1	7.0	6.8
Black	8.2	9.5	8.8	7.7	6.8	6.4
Race* Hispanic	14.7	14.4	15.6	15.8	15.1	15.5
Multi-Race	11.1	10.4	11.4	10.8	11.6	10.2
Pacific Islander	0.9	0.6	0.7	0.5	0.7	0.7
White	56.6	56.9	54.5	56.1	56.2	58.1
Sex Female	48.9	49.6	49.1	48.5	46.4	46.6
Male	51.1	50.4	50.	51.5	53.6	53.4

Linking Study Sample (Unweighted)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
Achievement Level	*Level 1*	25.8	25.8	31.0	31.7	27.6	31.1
	Level 2	20.6	26.6	25.9	25.1	21.2	20.2
	Level 3	28.5	27.5	19.2	18.0	22.5	16.6
	Level 4	25.1	20.1	23.9	25.2	28.6	32.1

*AI/AN = American Indian/Alaska Native.

Table 3.2. Spring 2019 OR SBAC Student Population Demographics

Spring 2019 OR SBAC Population							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA							
	Total N	42,299	43,476	44,905	44,654	43,229	41,762
Race*	AI/AN	1.1	1.2	1.2	1.3	1.3	1.3
	Asian	4.0	4.0	3.9	3.9	4.2	4.1
	Black	2.3	2.4	2.3	2.2	2.2	2.2
	Hispanic	24.0	24.6	24.7	24.6	24.8	24.4
	Multi-Race	6.6	6.6	6.7	6.5	6.3	6.3
	Pacific Islander	0.8	0.7	0.8	0.7	0.8	0.8
	White	61.3	60.5	60.5	60.7	60.4	61.1
Sex	Female	48.9	48.4	48.9	48.9	48.8	48.0
	Male	51.1	51.6	51.1	51.1	51.2	52.0
Achievement Level	*Level 1*	28.7	30.3	25.5	22.9	22.8	22.5
	Level 2	24.9	20.5	20.5	25.6	22.3	24.4
	Level 3	22.6	23.5	30.4	33.0	36.1	34.8
	Level 4	23.9	25.6	23.6	18.5	18.8	18.4
Mathematics							
	Total N	42,188	43,353	44,754	44,504	42,921	41,421
Race*	AI/AN	1.1	1.2	1.2	1.3	1.3	1.3
	Asian	4.0	4.0	3.9	4.0	4.2	4.1
	Black	2.3	2.4	2.3	2.2	2.1	2.2
	Hispanic	24.0	24.7	24.7	24.6	24.9	24.4
	Multi-Race	6.6	6.6	6.7	6.5	6.2	6.2
	Pacific Islander	0.8	0.7	0.8	0.7	0.8	0.8
	White	61.3	60.4	60.5	60.7	60.5	61.0
Sex	Female	48.9	48.3	48.9	48.9	48.7	47.9
	Male	51.1	51.7	51.1	51.1	51.3	52.1
Achievement Level	*Level 1*	30.0	25.6	34.2	34.2	33.6	37.8
	Level 2	23.6	31.2	27.9	28.7	26.3	24.0
	Level 3	26.4	25.1	17.5	18.8	20.8	16.9
	Level 4	20.0	18.1	20.3	18.3	19.3	21.3

*AI/AN = American Indian/Alaska Native.

Table 3.3. Linking Study Sample Demographics (Weighted)

				%Students by Grade			
Demographic Subgroup		**3**	**4**	**5**	**6**	**7**	**8**
ELA/Reading							
	Total N	1,964	2,003	1,817	1,322	1,253	1,057
Race*	AI/AN	1.1	1.2	1.2	1.3	1.3	1.3
	Asian	4.0	4.0	3.9	3.9	4.2	4.1
	Black	2.4	2.4	2.3	2.2	2.2	2.2
	Hispanic	24.0	24.7	24.7	24.6	24.9	24.4
	Multi-Race	6.5	6.6	6.7	6.5	6.3	6.3
	Pacific Islander	0.8	0.7	0.8	0.7	0.8	0.8
	White	61.3	60.4	60.5	60.7	60.4	61.0
Sex	Female	48.9	48.4	48.9	48.9	48.8	48.0
	Male	51.1	51.6	51.1	51.1	51.2	52.0
Achievement Level	*Level 1*	28.7	30.3	25.5	22.9	22.8	22.5
	Level 2	24.8	20.5	20.5	25.6	22.3	24.4
	Level 3	22.6	23.5	30.4	33.0	36.1	34.8
	Level 4	23.9	25.6	23.6	18.5	18.8	18.4
Mathematics							
	Total N	3,381	3,465	3,348	3,272	2,877	2,623
Race*	AI/AN	1.1	1.2	1.2	1.3	1.3	1.3
	Asian	4.0	4.0	3.9	4.0	4.2	4.1
	Black	2.3	2.4	2.3	2.2	2.1	2.2
	Hispanic	24.0	24.7	24.7	24.6	24.9	24.4
	Multi-Race	6.6	6.6	6.7	6.5	6.2	6.2
	Pacific Islander	0.8	0.7	0.8	0.7	0.8	0.8
	White	61.3	60.4	60.5	60.7	60.4	61.0
Sex	Female	48.9	48.3	48.9	48.9	48.7	47.9
	Male	51.1	51.7	51.1	51.1	51.3	52.1
Achievement Level	*Level 1*	30.0	25.6	34.2	34.2	33.6	37.8
	Level 2	23.6	31.2	27.9	28.7	26.3	24.0
	Level 3	26.4	25.1	17.5	18.8	20.8	16.9
	Level 4	20.0	18.1	20.3	18.3	19.3	21.3

*AI/AN = American Indian/Alaska Native.

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and OR SBAC test scores from Spring 2019, including the correlation coefficient (r) between them. The correlation coefficients between the scores range from 0.83 to 0.87 for ELA/reading and 0.88 to 0.91 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 OR SBAC summative assessments.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	r	OR SBAC*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	1,964	0.87	2420.8	95.1	2147	2697	198.4	18.4	148	240
4	2,003	0.86	2464.8	100.3	2184	2761	206.4	17.6	146	249
5	1,817	0.86	2509.0	101.4	2184	2775	212.3	17.1	152	266
6	1,322	0.85	2529.7	101.9	2186	2891	216.1	17.6	156	259
7	1,253	0.84	2556.2	107.3	1941	2852	219.7	17.8	156	266
8	1,057	0.83	2566.6	109.9	2245	2867	222.2	18.4	162	267
Mathematics										
3	3,381	0.89	2425.1	89.0	2097	2736	200.2	15.6	139	256
4	3,465	0.91	2465.7	89.5	2147	2796	210.1	16.7	147	269
5	3,348	0.90	2494.1	98.6	2067	2871	217.7	18.8	148	276
6	3,272	0.90	2508.1	115.7	1985	2924	221.2	17.9	159	272
7	2,877	0.90	2530.0	120.6	1908	3042	226.7	20.1	156	291
8	2,623	0.88	2544.8	131.0	2172	2972	232.0	21.9	159	295

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

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the OR SBAC 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 achievement level on the OR SBAC 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 192 in the fall is likely to achieve *Level 3* performance on the OR SBAC ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 202 in the spring is also likely to achieve *Level 3* performance on the OR SBAC summative assessment. 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 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 achievement level could be different from the generic projection presented in this document. Partners are therefore encouraged to use the projected achievement level in students' score reports since they reflect the specific instructional weeks set by partners.

Table 3.5. MAP Growth Cut Scores—ELA/Reading

OR SBAC ELA			
Grade	*Level 1*	*Level 2*	*Level 3*	*Level 4*
3	≤2366	2367–2431	**2432**–2489	≥2490
4	≤2415	2416–2472	**2473**–2532	≥2533
5	≤2441	2442–2501	**2502**–2581	≥2582
6	≤2456	2457–2530	**2531**–2617	≥2618
7	≤2478	2479–2551	**2552**–2648	≥2649
8	≤2486	2487–2566	**2567**–2667	≥2668

MAP Growth Reading*								
	Level 1		*Level 2*		*Level 3*		*Level 4*	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–161	1–24	162–179	25–68	**180**–192	69–90	193–350	91–99
3	100–176	1–27	177–191	28–62	**192**–203	63–84	204–350	85–99
4	100–190	1–36	191–200	37–59	**201**–211	60–81	212–350	82–99
5	100–194	1–27	195–206	28–55	**207**–218	56–80	219–350	81–99
6	100–197	1–22	198–212	23–56	**213**–227	57–85	228–350	86–99
7	100–202	1–24	203–215	25–53	**216**–232	54–86	233–350	87–99
8	100–205	1–23	206–220	24–56	**221**–235	57–84	236–350	85–99
Winter								
2	100–170	1–24	171–187	25–66	**188**–199	67–88	200–350	89–99
3	100–184	1–28	185–198	29–61	**199**–208	62–82	209–350	83–99
4	100–196	1–36	197–206	37–60	**207**–215	61–79	216–350	80–99
5	100–200	1–29	201–210	30–54	**211**–222	55–80	223–350	81–99
6	100–202	1–24	203–216	25–57	**217**–229	58–83	230–350	84–99
7	100–205	1–24	206–218	25–54	**219**–233	55–84	234–350	85–99
8	100–208	1–24	209–222	25–55	**223**–236	56–83	237–350	84–99
Spring								
2	100–175	1–26	176–191	27–65	**192**–203	66–87	204–350	88–99
3	100–188	1–30	189–201	31–61	**202**–211	62–81	212–350	82–99
4	100–199	1–37	200–208	38–59	**209**–217	60–78	218–350	79–99
5	100–202	1–30	203–212	31–54	**213**–223	55–78	224–350	79–99
6	100–204	1–25	205–217	26–56	**218**–230	57–83	231–350	84–99
7	100–207	1–25	208–219	26–53	**220**–234	54–84	235–350	85–99
8	100–210	1–25	211–223	26–55	**224**–237	56–82	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

Grade	Level 1	Level 2	Level 3	Level 4
OR SBAC Mathematics				
3	≤2380	2381–2435	**2436**–2500	≥2501
4	≤2410	2411–2484	**2485**–2548	≥2549
5	≤2454	2455–2527	**2528**–2578	≥2579
6	≤2472	2473–2551	**2552**–2609	≥2610
7	≤2483	2484–2566	**2567**–2634	≥2635
8	≤2503	2504–2585	**2586**–2652	≥2653

MAP Growth Mathematics*

	Level 1		Level 2		Level 3		Level 4	
Grade	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall								
2	100–165	1–23	166–177	24–58	**178**–188	59–85	189–350	86–99
3	100–179	1–25	180–189	26–54	**190**–200	55–81	201–350	82–99
4	100–188	1–22	189–202	23–58	**203**–213	59–83	214–350	84–99
5	100–200	1–29	201–214	30–64	**215**–223	65–83	224–350	84–99
6	100–207	1–33	208–219	34–62	**220**–228	63–80	229–350	81–99
7	100–213	1–35	214–225	36–62	**226**–236	63–82	237–350	83–99
8	100–221	1–43	222–234	44–69	**235**–244	70–85	245–350	86–99
Winter								
2	100–174	1–23	175–186	24–58	**187**–196	59–83	197–350	84–99
3	100–187	1–26	188–197	27–54	**198**–207	55–80	208–350	81–99
4	100–194	1–22	195–209	23–59	**210**–220	60–83	221–350	84–99
5	100–206	1–30	207–220	31–64	**221**–229	65–82	230–350	83–99
6	100–212	1–34	213–224	35–62	**225**–233	63–80	234–350	81–99
7	100–216	1–34	217–229	35–62	**230**–240	63–82	241–350	83–99
8	100–224	1–43	225–237	44–69	**238**–247	70–84	248–350	85–99
Spring								
2	100–180	1–26	181–191	27–57	**192**–201	58–82	202–350	83–99
3	100–192	1–27	193–202	28–54	**203**–212	55–79	213–350	80–99
4	100–199	1–24	200–213	25–58	**214**–224	59–81	225–350	82–99
5	100–210	1–31	211–224	32–64	**225**–233	65–81	234–350	82–99
6	100–215	1–34	216–227	35–61	**228**–236	62–78	237–350	79–99
7	100–219	1–35	220–232	36–62	**233**–243	63–81	244–350	82–99
8	100–226	1–42	227–239	43–68	**240**–249	69–83	250–350	84–99

*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 OR SBAC summative tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.83 to 0.85 for ELA/reading and 0.87 to 0.89 for mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the OR SBAC summative assessment. Classification accuracy statistics could not be calculated for Grade 2 for this linking study because of a lack of matched cases between Grade 2 and Grade 3 OR SBAC and MAP Growth data.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the OR SBAC summative tests, there is a notable limitation to how these results should be used and interpreted. The OR SBAC 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	OR SBAC		FP	FN				
ELA/Reading										
3	1,964	202	2432	0.85	0.16	0.13	0.87	0.84	0.83	0.94
4	2,003	209	2473	0.83	0.18	0.15	0.85	0.82	0.82	0.92
5	1,817	213	2502	0.85	0.17	0.13	0.87	0.83	0.86	0.94
6	1,322	218	2531	0.83	0.18	0.16	0.84	0.82	0.83	0.92
7	1,253	220	2552	0.85	0.16	0.14	0.86	0.84	0.86	0.93
8	1,057	224	2567	0.85	0.16	0.14	0.86	0.84	0.86	0.93
Mathematics										
3	3,381	203	2436	0.87	0.14	0.12	0.88	0.86	0.84	0.95
4	3,465	214	2485	0.88	0.12	0.12	0.88	0.88	0.85	0.96
5	3,348	225	2528	0.89	0.08	0.16	0.84	0.92	0.86	0.96
6	3,272	228	2552	0.87	0.12	0.16	0.84	0.88	0.81	0.95
7	2,877	233	2567	0.89	0.10	0.12	0.88	0.90	0.85	0.96
8	2,623	240	2586	0.89	0.09	0.13	0.87	0.91	0.85	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 *Level 3* performance on the OR SBAC summative test based on RIT scores from fall, winter, or spring. "Prob." indicates the probability of obtaining proficient status on the OR SBAC summative test in the spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 204 in the fall has a 91% chance of reaching the *Level 3* achievement level or higher on the OR SBAC summative test.

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

Grade	Start %ile	Spring Cut	Fall RIT	Fall Projected Proficiency Level 3	Fall Projected Proficiency Prob.	Winter RIT	Winter Projected Proficiency Level 3	Winter Projected Proficiency Prob.	Spring RIT	Spring Projected Proficiency Level 3	Spring Projected Proficiency Prob.
	5	192	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	192	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	192	157	No	<0.01	166	No	<0.01	170	No	<0.01
	20	192	160	No	0.01	169	No	<0.01	173	No	<0.01
	25	192	162	No	0.02	171	No	<0.01	175	No	<0.01
	30	192	164	No	0.03	173	No	<0.01	177	No	<0.01
	35	192	166	No	0.06	175	No	0.01	180	No	<0.01
	40	192	168	No	0.09	177	No	0.03	182	No	<0.01
	45	192	170	No	0.12	179	No	0.05	184	No	0.01
2	50	192	172	No	0.18	181	No	0.10	186	No	0.03
	55	192	174	No	0.25	183	No	0.17	188	No	0.11
	60	192	176	No	0.35	185	No	0.29	189	No	0.17
	65	192	178	No	0.45	187	No	0.43	192	Yes	0.50
	70	192	180	Yes	0.50	189	Yes	0.57	194	Yes	0.73
	75	192	183	Yes	0.65	191	Yes	0.71	196	Yes	0.89
	80	192	185	Yes	0.75	194	Yes	0.87	199	Yes	0.99
	85	192	188	Yes	0.82	197	Yes	0.95	202	Yes	>0.99
	90	192	192	Yes	0.93	200	Yes	0.99	205	Yes	>0.99
	95	192	197	Yes	0.98	206	Yes	>0.99	211	Yes	>0.99
	5	202	159	No	<0.01	167	No	<0.01	170	No	<0.01
	10	202	165	No	<0.01	173	No	<0.01	176	No	<0.01
	15	202	169	No	<0.01	177	No	<0.01	180	No	<0.01
	20	202	173	No	0.01	180	No	<0.01	183	No	<0.01
	25	202	175	No	0.02	183	No	<0.01	186	No	<0.01
	30	202	178	No	0.05	185	No	0.01	189	No	<0.01
	35	202	180	No	0.07	188	No	0.03	191	No	<0.01
	40	202	182	No	0.11	190	No	0.05	193	No	<0.01
	45	202	185	No	0.21	192	No	0.09	195	No	0.01
3	50	202	187	No	0.25	194	No	0.17	197	No	0.06
	55	202	189	No	0.34	196	No	0.29	199	No	0.17
	60	202	191	No	0.45	198	No	0.43	201	No	0.38
	65	202	193	Yes	0.55	200	Yes	0.57	203	Yes	0.62
	70	202	195	Yes	0.61	202	Yes	0.71	206	Yes	0.89
	75	202	198	Yes	0.75	205	Yes	0.87	208	Yes	0.97
	80	202	201	Yes	0.86	207	Yes	0.93	211	Yes	>0.99
	85	202	204	Yes	0.91	211	Yes	0.98	214	Yes	>0.99
	90	202	208	Yes	0.97	215	Yes	>0.99	218	Yes	>0.99
	95	202	214	Yes	0.99	220	Yes	>0.99	224	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**	
				Level 3	**Prob.**		*Level 3*	**Prob.**		*Level 3*	**Prob.**
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
5	5	213	178	No	<0.01	183	No	<0.01	185	No	<0.01
	10	213	183	No	<0.01	189	No	<0.01	191	No	<0.01
	15	213	187	No	0.01	193	No	<0.01	194	No	<0.01
	20	213	191	No	0.03	196	No	<0.01	198	No	<0.01
	25	213	193	No	0.05	198	No	0.01	200	No	<0.01
	30	213	196	No	0.11	201	No	0.03	203	No	<0.01
	35	213	198	No	0.13	203	No	0.06	205	No	0.01
	40	213	200	No	0.20	205	No	0.13	207	No	0.03
	45	213	202	No	0.29	207	No	0.22	209	No	0.11
	50	213	204	No	0.39	209	No	0.35	211	No	0.27
	55	213	207	Yes	0.50	211	Yes	0.50	213	Yes	0.50
	60	213	209	Yes	0.61	213	Yes	0.65	215	Yes	0.73
	65	213	211	Yes	0.71	215	Yes	0.78	217	Yes	0.89
	70	213	213	Yes	0.76	217	Yes	0.83	219	Yes	0.97
	75	213	216	Yes	0.87	220	Yes	0.94	222	Yes	>0.99
	80	213	218	Yes	0.92	222	Yes	0.97	224	Yes	>0.99
	85	213	221	Yes	0.95	226	Yes	>0.99	228	Yes	>0.99
	90	213	225	Yes	0.99	229	Yes	>0.99	231	Yes	>0.99
	95	213	231	Yes	>0.99	235	Yes	>0.99	237	Yes	>0.99

			ELA/Reading								
			Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
Grade	Start %ile	Spring Cut		*Level 3*	Prob.		*Level 3*	Prob.		*Level 3*	Prob.
6	5	218	183	No	<0.01	188	No	<0.01	189	No	<0.01
	10	218	189	No	<0.01	193	No	<0.01	195	No	<0.01
	15	218	193	No	<0.01	197	No	<0.01	199	No	<0.01
	20	218	196	No	0.02	200	No	<0.01	202	No	<0.01
	25	218	199	No	0.04	203	No	0.01	205	No	<0.01
	30	218	202	No	0.08	205	No	0.02	207	No	<0.01
	35	218	204	No	0.13	208	No	0.06	209	No	<0.01
	40	218	206	No	0.19	210	No	0.12	211	No	0.01
	45	218	208	No	0.24	212	No	0.22	213	No	0.06
	50	218	210	No	0.33	214	No	0.35	215	No	0.17
	55	218	212	No	0.44	216	No	0.42	217	No	0.38
	60	218	214	Yes	0.56	218	Yes	0.58	219	Yes	0.62
	65	218	217	Yes	0.67	220	Yes	0.72	222	Yes	0.89
	70	218	219	Yes	0.76	222	Yes	0.83	224	Yes	0.97
	75	218	221	Yes	0.84	225	Yes	0.94	226	Yes	0.99
	80	218	224	Yes	0.90	227	Yes	0.97	229	Yes	>0.99
	85	218	227	Yes	0.96	230	Yes	0.99	232	Yes	>0.99
	90	218	231	Yes	0.99	234	Yes	>0.99	236	Yes	>0.99
	95	218	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99
7	5	220	187	No	<0.01	190	No	<0.01	191	No	<0.01
	10	220	193	No	<0.01	196	No	<0.01	197	No	<0.01
	15	220	197	No	0.01	200	No	<0.01	201	No	<0.01
	20	220	200	No	0.02	203	No	<0.01	205	No	<0.01
	25	220	203	No	0.04	206	No	0.01	207	No	<0.01
	30	220	206	No	0.10	209	No	0.04	210	No	<0.01
	35	220	208	No	0.16	211	No	0.09	212	No	0.01
	40	220	210	No	0.24	213	No	0.12	214	No	0.03
	45	220	212	No	0.28	215	No	0.22	216	No	0.11
	50	220	214	No	0.39	217	No	0.35	218	No	0.27
	55	220	216	Yes	0.50	219	Yes	0.50	220	Yes	0.50
	60	220	218	Yes	0.61	221	Yes	0.65	223	Yes	0.83
	65	220	221	Yes	0.72	223	Yes	0.78	225	Yes	0.94
	70	220	223	Yes	0.81	226	Yes	0.91	227	Yes	0.99
	75	220	225	Yes	0.88	228	Yes	0.96	229	Yes	>0.99
	80	220	228	Yes	0.94	231	Yes	0.99	232	Yes	>0.99
	85	220	231	Yes	0.97	234	Yes	>0.99	235	Yes	>0.99
	90	220	235	Yes	0.99	238	Yes	>0.99	239	Yes	>0.99
	95	220	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99

			ELA/Reading								
			Fall			**Winter**			**Spring**		
	Start %ile	**Spring Cut**	**Fall RIT**	**Projected Proficiency**		**Winter RIT**	**Projected Proficiency**		**Spring RIT**	**Projected Proficiency**	
Grade				*Level 3*	**Prob.**		*Level 3*	**Prob.**		*Level 3*	**Prob.**
	5	224	190	No	<0.01	193	No	<0.01	194	No	<0.01
	10	224	196	No	<0.01	199	No	<0.01	200	No	<0.01
	15	224	200	No	0.01	203	No	<0.01	204	No	<0.01
	20	224	204	No	0.02	206	No	<0.01	207	No	<0.01
	25	224	207	No	0.05	209	No	0.01	210	No	<0.01
	30	224	209	No	0.08	212	No	0.02	213	No	<0.01
	35	224	211	No	0.11	214	No	0.04	215	No	<0.01
	40	224	214	No	0.20	216	No	0.09	217	No	0.01
	45	224	216	No	0.29	218	No	0.17	220	No	0.11
8	50	224	218	No	0.39	221	No	0.35	222	No	0.27
	55	224	220	No	0.45	223	Yes	0.50	224	Yes	0.50
	60	224	222	Yes	0.55	225	Yes	0.65	226	Yes	0.73
	65	224	225	Yes	0.71	227	Yes	0.78	228	Yes	0.89
	70	224	227	Yes	0.80	229	Yes	0.87	231	Yes	0.99
	75	224	230	Yes	0.87	232	Yes	0.96	233	Yes	>0.99
	80	224	232	Yes	0.92	235	Yes	0.99	236	Yes	>0.99
	85	224	236	Yes	0.97	238	Yes	>0.99	239	Yes	>0.99
	90	224	240	Yes	0.99	242	Yes	>0.99	243	Yes	>0.99
	95	224	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99

Table 3.9. Proficiency Projection based on RIT Scores—Mathematics

Grade	Start %ile	Spring Cut	Fall RIT	Fall Projected Proficiency Level 3	Fall Projected Proficiency Prob.	Winter RIT	Winter Projected Proficiency Level 3	Winter Projected Proficiency Prob.	Spring RIT	Spring Projected Proficiency Level 3	Spring Projected Proficiency Prob.
							Mathematics				
	5	192	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	192	158	No	<0.01	167	No	<0.01	172	No	<0.01
	15	192	162	No	0.01	171	No	<0.01	175	No	<0.01
	20	192	164	No	0.02	173	No	<0.01	178	No	<0.01
	25	192	166	No	0.04	175	No	0.01	180	No	<0.01
	30	192	168	No	0.08	177	No	0.03	182	No	<0.01
	35	192	170	No	0.14	179	No	0.07	184	No	<0.01
	40	192	172	No	0.22	181	No	0.10	186	No	0.02
	45	192	173	No	0.27	182	No	0.15	188	No	0.08
2	50	192	175	No	0.32	184	No	0.26	189	No	0.15
	55	192	177	No	0.44	186	No	0.42	191	No	0.37
	60	192	178	Yes	0.50	187	Yes	0.50	193	Yes	0.63
	65	192	180	Yes	0.62	189	Yes	0.66	195	Yes	0.85
	70	192	182	Yes	0.73	191	Yes	0.80	196	Yes	0.92
	75	192	184	Yes	0.82	193	Yes	0.90	198	Yes	0.98
	80	192	186	Yes	0.86	195	Yes	0.95	201	Yes	>0.99
	85	192	188	Yes	0.92	198	Yes	0.99	203	Yes	>0.99
	90	192	192	Yes	0.98	201	Yes	>0.99	207	Yes	>0.99
	95	192	196	Yes	0.99	205	Yes	>0.99	212	Yes	>0.99
	5	203	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	203	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	203	175	No	0.01	182	No	<0.01	186	No	<0.01
	20	203	177	No	0.02	185	No	<0.01	189	No	<0.01
	25	203	179	No	0.04	187	No	0.01	192	No	<0.01
	30	203	181	No	0.07	189	No	0.03	194	No	<0.01
	35	203	183	No	0.13	191	No	0.07	196	No	0.01
	40	203	185	No	0.21	193	No	0.14	198	No	0.04
	45	203	187	No	0.31	195	No	0.26	199	No	0.08
3	50	203	188	No	0.37	196	No	0.33	201	No	0.25
	55	203	190	Yes	0.50	198	Yes	0.50	203	Yes	0.50
	60	203	192	Yes	0.56	200	Yes	0.67	205	Yes	0.75
	65	203	194	Yes	0.69	201	Yes	0.74	207	Yes	0.92
	70	203	196	Yes	0.79	203	Yes	0.86	208	Yes	0.96
	75	203	198	Yes	0.87	205	Yes	0.93	211	Yes	>0.99
	80	203	200	Yes	0.93	208	Yes	0.98	213	Yes	>0.99
	85	203	202	Yes	0.96	210	Yes	0.99	216	Yes	>0.99
	90	203	206	Yes	0.99	214	Yes	>0.99	219	Yes	>0.99
	95	203	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99

			Mathematics								
			Fall			**Winter**			**Spring**		
	Start %ile	**Spring Cut**	**Fall RIT**	**Projected Proficiency**		**Winter RIT**	**Projected Proficiency**		**Spring RIT**	**Projected Proficiency**	
Grade				*Level 3*	**Prob.**		*Level 3*	**Prob.**		*Level 3*	**Prob.**
	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
4	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	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
5	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**		
	Start %ile	**Spring Cut**	**Fall RIT**	**Projected Proficiency**		**Winter RIT**	**Projected Proficiency**		**Spring RIT**	**Projected Proficiency**	
Grade				*Level 3*	**Prob.**		*Level 3*	**Prob.**		*Level 3*	**Prob.**
	5	228	188	No	<0.01	192	No	<0.01	194	No	<0.01
	10	228	194	No	<0.01	198	No	<0.01	200	No	<0.01
	15	228	198	No	<0.01	202	No	<0.01	205	No	<0.01
	20	228	201	No	<0.01	205	No	<0.01	208	No	<0.01
	25	228	204	No	0.01	208	No	<0.01	211	No	<0.01
	30	228	206	No	0.01	211	No	<0.01	214	No	<0.01
	35	228	209	No	0.04	213	No	0.01	216	No	<0.01
	40	228	211	No	0.08	215	No	0.02	218	No	<0.01
	45	228	213	No	0.14	217	No	0.04	221	No	0.01
6	50	228	215	No	0.22	220	No	0.14	223	No	0.04
	55	228	217	No	0.32	222	No	0.26	225	No	0.15
	60	228	219	No	0.44	224	No	0.42	227	No	0.37
	65	228	221	Yes	0.56	226	Yes	0.58	230	Yes	0.75
	70	228	223	Yes	0.68	228	Yes	0.74	232	Yes	0.92
	75	228	226	Yes	0.83	231	Yes	0.90	235	Yes	0.99
	80	228	228	Yes	0.90	234	Yes	0.97	238	Yes	>0.99
	85	228	231	Yes	0.96	237	Yes	0.99	241	Yes	>0.99
	90	228	235	Yes	0.99	241	Yes	>0.99	245	Yes	>0.99
	95	228	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99
	5	233	192	No	<0.01	194	No	<0.01	196	No	<0.01
	10	233	198	No	<0.01	201	No	<0.01	203	No	<0.01
	15	233	202	No	<0.01	205	No	<0.01	207	No	<0.01
	20	233	206	No	<0.01	209	No	<0.01	211	No	<0.01
	25	233	208	No	<0.01	212	No	<0.01	214	No	<0.01
	30	233	211	No	<0.01	215	No	<0.01	217	No	<0.01
	35	233	213	No	0.01	217	No	<0.01	220	No	<0.01
	40	233	216	No	0.04	219	No	0.01	222	No	<0.01
	45	233	218	No	0.10	222	No	0.04	224	No	<0.01
7	50	233	220	No	0.17	224	No	0.10	227	No	0.02
	55	233	222	No	0.26	226	No	0.20	229	No	0.08
	60	233	225	No	0.44	229	No	0.42	231	No	0.25
	65	233	227	Yes	0.56	231	Yes	0.58	234	Yes	0.63
	70	233	229	Yes	0.69	233	Yes	0.74	236	Yes	0.85
	75	233	232	Yes	0.83	236	Yes	0.90	239	Yes	0.98
	80	233	235	Yes	0.93	239	Yes	0.97	242	Yes	>0.99
	85	233	238	Yes	0.97	243	Yes	>0.99	246	Yes	>0.99
	90	233	243	Yes	>0.99	247	Yes	>0.99	251	Yes	>0.99
	95	233	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99

			Fall			Winter			Spring		
				Projected Proficiency			**Projected Proficiency**			**Projected Proficiency**	
Grade	**Start %ile**	**Spring Cut**	**Fall RIT**	*Level 3*	**Prob.**	**Winter RIT**	*Level 3*	**Prob.**	**Spring RIT**	*Level 3*	**Prob.**
	5	240	194	No	<0.01	196	No	<0.01	197	No	<0.01
	10	240	201	No	<0.01	203	No	<0.01	205	No	<0.01
	15	240	205	No	<0.01	208	No	<0.01	210	No	<0.01
	20	240	209	No	<0.01	212	No	<0.01	214	No	<0.01
	25	240	212	No	<0.01	215	No	<0.01	217	No	<0.01
	30	240	215	No	<0.01	218	No	<0.01	220	No	<0.01
	35	240	218	No	0.01	221	No	<0.01	223	No	<0.01
	40	240	220	No	0.02	223	No	<0.01	225	No	<0.01
	45	240	223	No	0.04	226	No	0.01	228	No	<0.01
8	50	240	225	No	0.07	228	No	0.02	230	No	<0.01
	55	240	227	No	0.12	231	No	0.07	233	No	0.01
	60	240	230	No	0.24	233	No	0.15	235	No	0.04
	65	240	232	No	0.33	236	No	0.34	238	No	0.25
	70	240	235	Yes	0.50	238	Yes	0.50	241	Yes	0.63
	75	240	238	Yes	0.67	241	Yes	0.73	244	Yes	0.92
	80	240	241	Yes	0.81	244	Yes	0.89	247	Yes	0.99
	85	240	245	Yes	0.93	248	Yes	0.98	251	Yes	>0.99
	90	240	249	Yes	0.98	253	Yes	>0.99	256	Yes	>0.99
	95	240	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99

Table title: **Mathematics**

4. References

He, W., & Meyer, J. (2021). *MAP Growth universal screening benchmarks*. NWEA Research Report.

Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking*. Springer.

Lumley, T. (2019). *Survey: Analysis of complex survey samples*. R package version 3.36. https://CRAN.R-project.org/package=survey.

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.