

Predicting Performance on the Colorado Measures of Academic Success (CMAS) Based on NWEA MAP Growth Scores

August 2025

NWEA Psychometrics and Analytics



Linking Study Updates

Date	Description
2020-07	Conducted a linking study for grades 3–8 in ELA and mathematics based on the 2020 norms and Spring 2018 data.
2025-08	Updated the linking study based on the 2025 norms.

Acknowledgements: This report was made possible with the contributions of Yan Zhou, Ann Hu, Justin Schreiber, Christopher Wells, and Derek May. We appreciate our colleagues at NWEA and all our partners who provided data for the study.

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Executive Summary

To predict student achievement on the Colorado Measures of Academic Progress (CMAS) in grades 3–8 English language arts (ELA) and mathematics, NWEA® conducted a linking study using Spring 2018 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the CMAS 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 to incorporate the most recent 2025 NWEA MAP Growth norms (NWEA, 2025).

Table E.1 presents the *Met Expectations* 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 *Met Expectations* cut score on the CMAS grade 3 ELA test is 750. A grade 3 student with a MAP Growth reading RIT score of 196 in the fall is likely to meet proficiency on the CMAS ELA test in the spring, whereas a grade 3 student with a MAP Growth reading RIT score lower than 196 in the fall is in jeopardy of not meeting proficiency. MAP Growth cut scores for grade 2 are also provided so that educators can track early learners' progress toward proficiency on the CMAS test by grade 3. These cut scores were derived based on the grade 3 cuts and the 2025 NWEA growth norms for the adjacent grade (i.e., grades 2 to 3).

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

Assessment		Met Expectations Cut Scores by Grade						
		2	3	4	5	6	7	8
ELA/Reading								
CMAS Spring		–	750	750	750	750	750	750
MAP Growth	Fall	183	196	205	211	218	220	224
	Winter	189	201	208	214	219	221	225
	Spring	193	204	210	215	220	222	226
Mathematics								
CMAS Spring		–	750	750	750	750	750	750
MAP Growth	Fall	187	196	214	221	227	235	239
	Winter	195	205	222	227	234	240	244
	Spring	200	211	227	231	238	242	246

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.

E.1. Assessment Overview

The CMAS grades 3–8 ELA and mathematics tests are Colorado’s state summative assessments aligned to the Colorado Academic Standards. Based on their test scores, students are placed into one of five performance levels: *Did Not Yet Meet Expectations*, *Partially Met Expectations*, *Approached Expectations*, *Met Expectations*, and *Exceeded Expectations*. These tests are used to provide evidence of student achievement in ELA and mathematics for various test score uses, such as meeting the requirements of the state’s accountability program. The *Met Expectations* 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 2018 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring CMAS performance level cut scores. MAP Growth spring cut scores for grade 2 were then derived from the spring cuts for grade 3 and the growth norms for the adjacent grade (i.e., grades 2 to 3). Similarly, the MAP Growth cut scores for the fall and winter administrations of all grades were derived from the spring administration cuts and the growth norms for either fall to spring or winter to spring, respectively. The spring cuts¹ for mathematics were adjusted for score alignment before deriving the cuts for grade 2 spring and for all grades’ fall and winter administrations.

E.3. Student Sample

Only students who took both the MAP Growth and CMAS assessments in Spring 2018 were included in the study sample. Table E.2 presents the weighted numbers of Colorado students from 15 districts and 106 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.

¹ To enhance content validity, NWEA developed an Enhanced Item-Selection Algorithm (EISA) for the MAP Growth assessment to prioritize grade-level content. A pilot study (Meyer et al., 2023) showed that students taking MAP Growth with EISA demonstrated higher average math scores compared with those taking traditional MAP Growth. To improve score comparability, NWEA (Lewis & Kuhfeld, 2024) developed concordance tables to adjust mathematics scores from traditional assessments to align with scores from MAP Growth with EISA, or vice versa. Given that the data for this study were collected from traditional MAP Growth tests but that the results will be used for MAP Growth with EISA, the spring cuts for mathematics were adjusted using the concordance tables before being used to derive other cut scores. This score adjustment will become unnecessary for future linking studies once the new data from EISA tests are collected.

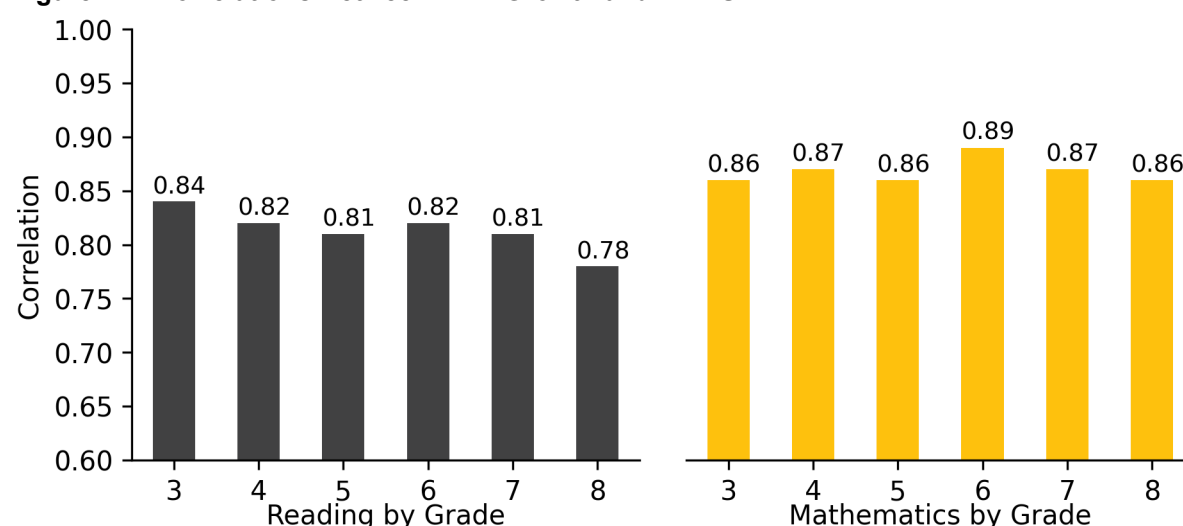
Table E.2. Linking Study Sample

Grade	# Students	
	ELA/Reading	Mathematics
3	3,518	4,528
4	4,671	4,636
5	4,427	4,767
6	4,436	4,743
7	4,144	4,293
8	3,152	3,484

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and CMAS scores range from 0.78 to 0.89 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 CMAS assessments.

Figure E.1. Correlations Between MAP Growth and CMAS

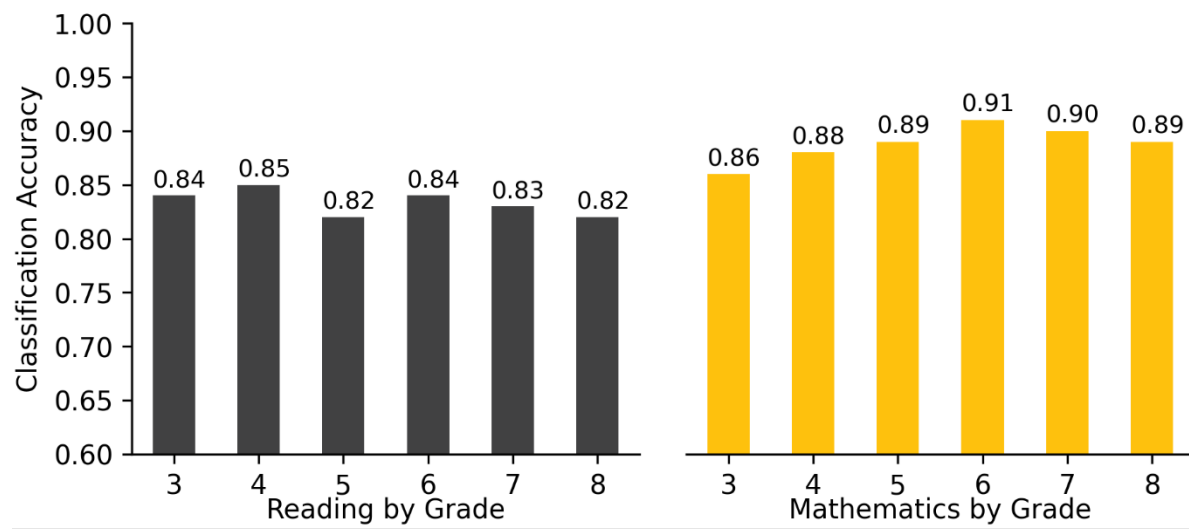


E.5. Accuracy of MAP Growth Classifications

Figure E.2 presents the classification accuracy statistics that show the proportion of students correctly classified by their RIT scores as proficient (*Met Expectations* or higher) or not proficient (lower than *Met Expectations*) on the CMAS tests.² For example, the MAP Growth reading grade 3 *Met Expectations* cut score has a 0.84 accuracy rate, meaning it accurately classified student achievement on the state test for 84% of the sample. The results range from 0.82 to 0.91 across both content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the CMAS tests.

² The classification accuracy calculations for the mathematics spring cuts were based on the concurred cut scores.

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 report presents results from a linking study conducted by NWEA in July 2020 to statistically connect the scores of the Colorado Measures of Academic Success (CMAS) in grades 3–8 English language arts (ELA) and mathematics with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2018 term. The linking study has been updated since the previous version to incorporate the most recent 2025 NWEA MAP Growth norms (NWEA, 2025). In this updated study, MAP Growth cut scores are also included for grade 2 so that educators can track early learners' progress toward proficiency on the CMAS test by grade 3. This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth RIT cut scores that correspond to the CMAS performance levels using the equipercentile linking procedure for the spring results and the 2025 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 CMAS tests
5. The probability of achieving grade-level proficiency on the CMAS assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2025 norms

1.2. Assessment Overview

The CMAS grades 3–8 ELA and mathematics summative assessments are aligned to the Colorado Academic Standards. Each assessment has four 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: *Did Not Yet Meet Expectations*, *Partially Met Expectations*, *Approached Expectations*, *Met Expectations*, and *Exceeded Expectations*. The *Met Expectations* 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 with 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 2025 (NWEA, 2025).

2. Methods

2.1. Data Collection

This linking study is based on data from the Spring 2018 administrations of the MAP Growth and CMAS assessments. NWEA requested that Colorado districts recruited to participate in the study share their student and score data for the target term. Districts also permitted NWEA to access students' associated MAP Growth scores from the NWEA in-house database. Once Colorado state score information was available to 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 CMAS assessments in Spring 2018 were included in the study sample.

2.2. Post-Stratification Weighting

Post-stratification weights were applied to the calculations to ensure that the linking study sample represented the state population in terms of race, sex, and performance level. These variables were selected because they are correlated with the student's academic achievement within this study and are often provided in the data for the state population. The weighted sample matches the target population as closely as possible for 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:

1. Calculate marginal distributions of race, sex, and performance level for the sample and population.
2. Calculate post-stratification weights with the rake function from the survey package in R (Lumley, 2019).
3. Apply the weights to the sample before conducting the linking study analyses.

2.3. MAP Growth Cut Scores

The equipercntile linking method (Kolen & Brennan, 2004) was used to identify the spring RIT scores that correspond to the spring CMAS performance level cut scores. Spring cuts for grade 2 were derived based on the cuts for grade 3 and the 2025 NWEA growth norms. RIT fall and winter cut scores that predict proficiency on the spring CMAS test were then projected using the 2025 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 test scores. This is useful for understanding (1) how student scores compare with peers nationwide and (2) the relative rigor of a state's performance level designations for its summative assessment.

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

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

where $e_y(x)$ is the equipercentile equivalent of score x on the CMAS tests on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on the CMAS tests, 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. The equation below 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:

$$RIT_{PredSpring} = RIT_{previous} + g$$

where:

- $RIT_{PredSpring}$ is the predicted MAP Growth spring score,
- $RIT_{previous}$ is the previous term's or grade's RIT score, and
- 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 CMAS 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 (*Met Expectations* or higher) or not proficient (lower than *Met Expectations*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich et al., 2004). The results are based on the Spring 2018 MAP Growth and CMAS data for the *Met Expectations* cut score.

Table 2.1. Description of Classification Accuracy Summary Statistics

Statistic	Description	Interpretation
Overall Classification Accuracy Rate	$(TP + TN) / (\text{total sample size})$	Proportion of the study sample whose proficiency classification on the state test was correctly predicted by MAP Growth cut scores
False Negative (FN) Rate	$FN / (FN + TP)$	Proportion of students identified by MAP Growth as not proficient in those observed as proficient on the state test
False Positive (FP) Rate	$FP / (FP + TN)$	Proportion of students identified by MAP Growth as not proficient in those observed as not proficient on the state test
Sensitivity	$TP / (TP + FN)$	Proportion of students identified by MAP Growth as proficient in those observed as such on the state test
Specificity	$TN / (TN + FP)$	Proportion of students identified by MAP Growth as not proficient in those observed as such on the state test
Precision	$TP / (TP + FP)$	Proportion of students observed as proficient 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.

Note. FP = false positives; FN = false negatives; TP = true positives; TN = true negatives.

2.5. Proficiency Projections

Given that all test scores contain measurement errors, reaching the *Met Expectations* RIT cut does not guarantee that a student is proficient on the state test. Instead, it can be claimed that a student meeting the RIT cut score has a 50% chance of reaching proficiency (*Met Expectations* or higher) on the state test, with their chances increasing the greater their score is from the cut. The proficiency projections indicate these probabilities for various RIT scores throughout the year.

In addition to calculating the MAP Growth fall and winter cut scores (and the projected grade 2 cut scores), the MAP Growth conditional growth norms data were also used to calculate the probability of reaching proficiency on the CMAS tests based on a student’s RIT scores from fall, winter, and spring. The equation below was used to calculate the probability of a student reaching proficiency on the CMAS tests based on their fall or winter RIT score:

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

where:

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

The equation below was used to estimate the probability of a student achieving proficiency (*Met Expectations* or higher) on the CMAS test based on their spring RIT score (RIT_{Spring}):

$$Pr(\text{Achieving proficiency in spring} \mid \text{spring RIT}) = \Phi\left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE}\right)$$

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 CMAS assessments in Spring 2018 were included in the study sample. Data used in this study were collected from 15 districts and 106 schools in Colorado. 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 who took the Spring 2018 CMAS tests (CDE, 2018). Since the unweighted data are different from the general CMAS 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 CMAS student population distributions. The analyses in this study were therefore conducted based on the weighted sample.

Table 3.1. Linking Study Sample Demographics (Unweighted)

Demographic Subgroup		% Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		3,514	4,676	4,423	4,436	4,144	3,152
Race	Asian	4.5	3.5	4.0	3.9	4.1	5.0
	Black	1.2	1.3	1.6	1.6	1.6	1.7
	Hispanic	39.9	35.7	36.4	38.9	42.5	41.8
	Multiracial	3.7	3.8	3.6	2.6	2.8	2.3
	Other	6.7	5.5	5.2	2.1	0.8	0.6
	White	44.0	50.1	49.2	51.1	48.	48.5
Sex	Female	47.3	47.6	48.3	48.4	49.2	46.2
	Male	52.7	52.4	51.7	51.6	50.8	53.8
Performance Level	<i>Did Not Yet Meet</i>	19.2	11.1	10.2	12.5	15.4	17.0
	<i>Partially Met</i>	19.0	18.1	17.2	21.8	17.7	18.0
	<i>Approached</i>	24.2	26.3	27.7	28.6	24.3	24.0
	<i>Met</i>	33.5	33.8	39.2	30.6	30.0	31.6
	<i>Exceeded</i>	4.1	10.6	5.7	6.5	12.7	9.4
Mathematics							
Total N		4,523	4,641	4,767	4,738	4,293	3,484
Race	Asian	3.7	3.6	3.9	3.8	4.0	4.3
	Black	1.1	1.3	1.5	1.5	1.6	1.7
	Hispanic	36.7	35.6	35.9	38.1	42.0	40.2
	Multiracial	3.6	3.9	3.5	2.5	3.0	2.7
	Other	6.1	6.3	5.7	1.5	1.0	0.6
	White	48.8	49.3	49.5	52.6	48.5	50.5
Sex	Female	47.3	47.6	48.3	48.4	48.9	47.2
	Male	52.7	52.4	51.7	51.6	51.1	52.8
Performance Level	<i>Did Not Yet Meet</i>	18.3	17.3	15.5	15.6	11.4	19.9
	<i>Partially Met</i>	23.6	25.6	24.7	28.5	26.5	20.6
	<i>Approached</i>	27.0	27.0	27.2	28.7	34.1	24.0
	<i>Met</i>	25.1	27.9	27.3	22.7	25.5	30.0
	<i>Exceeded</i>	6.1	2.2	5.4	4.4	2.5	5.5

Table 3.2. Spring 2018 CMAS Student Population Demographics

Demographic Subgroup		% Students by Grade					
		3	4	5	6	7	8
ELA							
Total N		63,016	64,789	65,359	63,647	60,907	58,684
Race	Asian	3.0	3.1	3.1	3.1	3.4	3.4
	Black	4.8	4.6	4.6	4.5	4.6	4.5
	Hispanic	33.3	33.9	34.9	34.3	35.2	34.9
	Multiracial	4.6	4.6	4.5	4.2	4.1	3.8
	Other	0.9	0.9	1.0	1.0	1.0	1.0
	White	53.3	52.8	52.0	52.9	51.7	52.5
Sex	Female	48.7	48.5	48.7	48.6	48.6	48.3
	Male	51.3	51.5	51.3	51.4	51.4	51.7
Performance Level	<i>Did Not Yet Meet</i>	17.8	10.6	9.9	10.5	14.4	14.7
	<i>Partially Met</i>	18.1	17.2	16.1	18.9	15.7	17.1
	<i>Approached</i>	23.8	26.1	26.7	27.8	23.3	24.4
	<i>Met</i>	36.7	35.6	41.9	35.1	31.5	33.4
	<i>Exceeded</i>	3.7	10.4	5.5	7.7	15.1	10.4
Mathematics							
Total N		64,714	65,995	65,516	63,765	59,983	49,189
Race	Asian	3.0	3.1	3.1	3.2	3.2	2.8
	Black	4.7	4.6	4.6	4.5	4.6	5.0
	Hispanic	35.0	35.0	35.0	34.4	35.8	38.8
	Multiracial	4.5	4.5	4.5	4.2	4.1	3.7
	Other	0.9	0.9	0.9	1.0	1.0	1.1
	White	52.0	51.8	51.9	52.8	51.2	48.5
Sex	Female	48.7	48.6	48.7	48.6	48.8	48.3
	Male	51.3	51.4	51.3	51.4	51.2	51.7
Performance Level	<i>Did Not Yet Meet</i>	14.3	15.4	13.7	14.1	12.3	22.9
	<i>Partially Met</i>	19.8	23.5	23.1	27.2	24.7	23.6
	<i>Approached</i>	26.9	27.2	27.7	28.4	34.2	25.4
	<i>Met</i>	31.0	31.1	29.3	26.2	26.0	25.4
	<i>Exceeded</i>	8.1	2.7	6.2	4.2	2.8	2.7

Table 3.3. Linking Study Sample Demographics (Weighted)

Demographic Subgroup		% Students by Grade					
		3	4	5	6	7	8
ELA/Reading							
Total N		3,518	4,671	4,427	4,436	4,144	3,152
Race	Asian	3.0	3.1	3.1	3.1	3.4	3.4
	Black	4.8	4.6	4.6	4.5	4.6	4.5
	Hispanic	33.3	33.9	34.9	34.3	35.2	34.9
	Multiracial	4.6	4.6	4.5	4.2	4.1	3.8
	Other	0.9	0.9	1.0	1.0	1.0	1.0
	White	53.4	52.9	52.0	52.9	51.7	52.5
Sex	Female	48.7	48.5	48.7	48.6	48.6	48.3
	Male	51.3	51.5	51.3	51.4	51.4	51.7
Performance Level	<i>Did Not Yet Meet</i>	17.8	10.6	9.9	10.5	14.4	14.7
	<i>Partially Met</i>	18.1	17.2	16.1	18.9	15.7	17.1
	<i>Approached</i>	23.8	26.1	26.7	27.8	23.3	24.4
	<i>Met</i>	36.7	35.6	41.9	35.1	31.5	33.4
	<i>Exceeded</i>	3.7	10.4	5.5	7.7	15.1	10.4
Mathematics							
Total N		4,528	4,636	4,767	4,743	4,293	3,484
Race	Asian	3.0	3.1	3.1	3.2	3.2	2.8
	Black	4.7	4.6	4.6	4.5	4.6	5.0
	Hispanic	35.0	35.0	35.0	34.4	35.8	38.8
	Multiracial	4.5	4.5	4.5	4.2	4.1	3.7
	Other	0.9	0.9	0.9	1.0	1.0	1.1
	White	51.9	51.9	51.9	52.8	51.3	48.5
Sex	Female	48.7	48.6	48.7	48.6	48.8	48.3
	Male	51.3	51.4	51.3	51.4	51.2	51.7
Performance Level	<i>Did Not Yet Meet</i>	14.3	15.4	13.7	14.1	12.3	22.9
	<i>Partially Met</i>	19.8	23.5	23.1	27.2	24.7	23.6
	<i>Approached</i>	26.9	27.2	27.7	28.4	34.2	25.4
	<i>Met</i>	31.0	31.1	29.3	26.2	26.0	25.4
	<i>Exceeded</i>	8.1	2.7	6.2	4.2	2.8	2.7

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and CMAS test scores from Spring 2018, including the correlation coefficients (r) between them. The correlation coefficients between the scores range from 0.78 to 0.84 for ELA/reading and 0.86 to 0.89 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 CMAS assessments.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	r	CMAS				MAP Growth			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	3,518	0.84	738.6	39.7	650	850	198.5	16.1	139	242
4	4,671	0.82	745.3	35.8	650	850	206.2	15.8	147	249
5	4,427	0.81	745.5	34.2	650	850	211.8	15.3	150	251
6	4,436	0.82	742.4	33.6	650	850	215.4	15.8	150	252
7	4,144	0.81	744.1	39.5	650	850	219.4	16.0	150	262
8	3,152	0.78	742.8	39.6	650	850	222.1	17.1	149	264
Mathematics										
3	4,528	0.86	738.6	36.7	650	850	202.9	14.4	140	266
4	4,636	0.87	734.2	33.3	650	850	213.2	16.4	142	294
5	4,767	0.86	736.7	33.9	650	850	220.9	17.1	137	281
6	4,743	0.89	732.9	31.6	650	850	223.6	17.7	157	292
7	4,293	0.87	733.1	28.6	650	833	228.9	18.8	150	294
8	3,484	0.86	728.5	38.0	650	850	230.3	19.7	155	293

Note. SD = standard deviation; Min. = minimum; Max. = maximum.

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the CMAS 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 CMAS 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 196 in the fall is likely to reach *Met Expectations* performance on the CMAS ELA test. A grade 3 student who obtained a MAP Growth reading RIT score of 201 in the winter is also likely to reach *Met Expectations* performance on the CMAS. The winter cut score is higher than the fall cut score because growth is expected between fall and winter 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 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

CMAS ELA										
Grade	Did Not Yet Meet		Partially Met		Approached		Met		Exceeded	
3	650–699		700–724		725–749		750–809		810–850	
4	650–699		700–724		725–749		750–789		790–850	
5	650–699		700–724		725–749		750–798		799–850	
6	650–699		700–724		725–749		750–789		790–850	
7	650–699		700–724		725–749		750–784		785–850	
8	650–699		700–724		725–749		750–793		794–850	
MAP Growth Reading										
Grade	Did Not Yet Meet		Partially Met		Approached		Met		Exceeded	
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall										
2	100–155	1–20	156–171	21–54	172–182	55–76	183–209	77–98	210–350	99–99
3	100–173	1–27	174–185	28–52	186–195	53–72	196–217	73–96	218–350	97–99
4	100–177	1–15	178–191	16–40	192–204	41–68	205–220	69–91	221–350	92–99
5	100–184	1–13	185–198	14–38	199–210	39–65	211–230	66–93	231–350	94–99
6	100–189	1–12	190–204	13–40	205–217	41–69	218–233	70–92	234–350	93–99
7	100–199	1–22	200–209	23–43	210–219	44–67	220–234	68–90	235–350	91–99
8	100–201	1–20	202–214	21–47	215–223	48–68	224–239	69–91	240–350	92–99
Winter										
2	100–162	1–20	163–177	21–52	178–188	53–75	189–214	76–98	215–350	99–99
3	100–179	1–28	180–190	29–51	191–200	52–72	201–221	73–95	222–350	96–99
4	100–181	1–15	182–195	16–41	196–207	42–67	208–222	68–90	223–350	91–99
5	100–187	1–13	188–200	14–37	201–213	38–66	214–231	67–92	232–350	93–99
6	100–191	1–12	192–206	13–40	207–218	41–68	219–234	69–92	235–350	93–99
7	100–200	1–21	201–211	22–45	212–220	46–66	221–235	67–90	236–350	91–99
8	100–202	1–20	203–215	21–47	216–224	48–67	225–240	68–91	241–350	92–99
Spring										
2	100–169	1–24	170–182	25–52	183–192	53–73	193–215	74–97	216–350	98–99
3	100–184	1–30	185–194	31–52	195–203	53–70	204–222	71–94	223–350	95–99
4	100–186	1–19	187–198	20–42	199–209	43–66	210–223	67–88	224–350	89–99
5	100–191	1–16	192–203	17–39	204–214	40–64	215–232	65–91	233–350	92–99
6	100–195	1–16	196–208	17–42	209–219	43–67	220–235	68–91	236–350	92–99
7	100–203	1–25	204–212	26–45	213–221	46–65	222–236	66–89	237–350	90–99
8	100–205	1–24	206–216	25–47	217–225	48–67	226–241	68–91	242–350	92–99

Note. 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. Bold numbers indicate the cut scores considered to be at least proficient for accountability purposes.

Table 3.6. MAP Growth Cut Scores—Mathematics

CMAS Mathematics										
Grade	Did Not Yet Meet		Partially Met		Approached		Met		Exceeded	
3	650–699		700–724		725–749		750–789		790–850	
4	650–699		700–724		725–749		750–795		796–850	
5	650–699		700–724		725–749		750–789		790–850	
6	650–699		700–724		725–749		750–787		788–850	
7	650–699		700–724		725–749		750–785		786–850	
8	650–699		700–724		725–749		750–800		801–850	
MAP Growth Mathematics										
Grade	Did Not Yet Meet		Partially Met		Approached		Met		Exceeded	
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall										
2	100–159	1–19	160–172	20–49	173–186	50–81	187–207	82–98	208–350	99–99
3	100–174	1–27	175–184	28–51	185–195	52–77	196–212	78–96	213–350	97–99
4	100–187	1–28	188–200	29–59	201–213	60–85	214–233	86–98	234–350	99–99
5	100–195	1–25	196–208	26–56	209–220	57–81	221–239	82–97	240–350	98–99
6	100–197	1–21	198–212	22–56	213–226	57–84	227–244	85–98	245–350	99–99
7	100–203	1–21	204–218	22–53	219–234	54–84	235–258	85–98	259–350	99–99
8	100–214	1–34	215–226	35–60	227–238	61–81	239–260	82–97	261–350	98–99
Winter										
2	100–167	1–19	168–181	20–51	182–194	52–80	195–215	81–98	216–350	99–99
3	100–182	1–27	183–193	28–52	194–204	53–77	205–221	78–95	222–350	96–99
4	100–194	1–28	195–207	29–57	208–221	58–84	222–242	85–98	243–350	99–99
5	100–200	1–26	201–214	27–56	215–226	57–80	227–247	81–97	248–350	98–99
6	100–202	1–22	203–218	23–56	219–233	57–84	234–252	85–97	253–350	98–99
7	100–206	1–21	207–222	22–53	223–239	54–84	240–264	85–98	265–350	99–99
8	100–218	1–35	219–230	36–59	231–243	60–82	244–266	83–97	267–350	98–99
Spring										
2	100–175	1–23	176–187	24–50	188–199	51–77	200–218	78–97	219–350	98–99
3	100–189	1–29	190–199	30–51	200–210	52–75	211–226	76–94	227–350	95–99
4	100–200	1–30	201–213	31–58	214–226	59–82	227–247	83–97	248–350	98–99
5	100–204	1–27	205–218	28–55	219–230	56–78	231–250	79–96	251–350	97–99
6	100–207	1–24	208–222	25–55	223–237	56–82	238–256	83–97	257–350	98–99
7	100–209	1–23	210–225	24–53	226–241	54–82	242–265	83–98	266–350	99–99
8	100–221	1–36	222–233	37–59	234–245	60–79	246–267	80–96	268–350	97–99

Note. 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. Bold 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 rates. These results indicate how well MAP Growth spring RIT scores predict proficiency on the CMAS tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rates range from 0.82 to 0.85 for ELA/reading and 0.86 to 0.91 for mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient (*Met Expectations* or higher) or not proficient (lower than *Met Expectations*) on the CMAS assessment.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the CMAS tests, there is a notable limitation to how these results should be used and interpreted. CMAS 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	CMAS		FP	FN				
ELA/Reading										
3	3,518	204	750	0.84	0.16	0.17	0.83	0.84	0.78	0.92
4	4,671	210	750	0.85	0.15	0.16	0.84	0.85	0.83	0.93
5	4,427	215	750	0.82	0.17	0.19	0.81	0.83	0.81	0.90
6	4,436	220	750	0.84	0.14	0.18	0.82	0.86	0.81	0.92
7	4,144	222	750	0.83	0.18	0.17	0.83	0.82	0.80	0.91
8	3,152	226	750	0.82	0.18	0.18	0.82	0.82	0.78	0.90
Mathematics										
3	4,528	208	750	0.86	0.12	0.18	0.82	0.88	0.82	0.93
4	4,636	221	750	0.88	0.08	0.19	0.81	0.92	0.83	0.95
5	4,767	228	750	0.89	0.09	0.16	0.84	0.91	0.84	0.95
6	4,743	234	750	0.91	0.07	0.14	0.86	0.93	0.84	0.97
7	4,293	240	750	0.90	0.08	0.16	0.84	0.92	0.82	0.96
8	3,484	242	750	0.89	0.08	0.18	0.82	0.92	0.80	0.95

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

3.5. Proficiency Projections

Table 3.8 and Table 3.9 present the estimated probability of achieving proficiency (*Met Expectations* or higher) on the CMAS 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 75% chance of reaching proficiency on the CMAS test. “Prob.” indicates the probability of obtaining proficiency status on the CMAS test in the spring.

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

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
2	5	193	142	No	<0.01	149	No	<0.01	153	No	<0.01
	10	193	148	No	<0.01	155	No	<0.01	159	No	<0.01
	15	193	152	No	<0.01	159	No	<0.01	164	No	<0.01
	20	193	156	No	0.01	162	No	<0.01	167	No	<0.01
	25	193	159	No	0.01	165	No	<0.01	170	No	<0.01
	30	193	161	No	0.02	168	No	0.01	173	No	<0.01
	35	193	163	No	0.03	170	No	0.02	175	No	<0.01
	40	193	166	No	0.05	172	No	0.04	177	No	<0.01
	45	193	168	No	0.07	175	No	0.06	180	No	<0.01
	50	193	170	No	0.11	177	No	0.09	182	No	<0.01
	55	193	172	No	0.13	179	No	0.14	184	No	0.01
	60	193	174	No	0.19	181	No	0.17	186	No	0.02
	65	193	177	No	0.29	183	No	0.24	188	No	0.08
	70	193	179	No	0.33	186	No	0.36	191	No	0.28
	75	193	182	No	0.46	188	No	0.45	193	Yes	0.5
	80	193	184	Yes	0.54	191	Yes	0.55	196	Yes	0.8
	85	193	188	Yes	0.67	194	Yes	0.68	200	Yes	0.98
	90	193	192	Yes	0.81	199	Yes	0.83	204	Yes	>0.99
	95	193	198	Yes	0.93	205	Yes	0.95	210	Yes	>0.99
3	5	204	155	No	<0.01	160	No	<0.01	164	No	<0.01
	10	204	161	No	<0.01	167	No	<0.01	171	No	<0.01
	15	204	166	No	<0.01	171	No	<0.01	175	No	<0.01
	20	204	169	No	<0.01	175	No	<0.01	179	No	<0.01
	25	204	172	No	0.01	178	No	0.01	182	No	<0.01
	30	204	175	No	0.02	180	No	0.01	184	No	<0.01
	35	204	178	No	0.04	183	No	0.03	187	No	<0.01
	40	204	180	No	0.06	185	No	0.04	189	No	<0.01

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	45	204	182	No	0.07	188	No	0.08	192	No	<0.01
	50	204	185	No	0.13	190	No	0.12	194	No	<0.01
	55	204	187	No	0.18	192	No	0.17	196	No	0.01
	60	204	189	No	0.25	194	No	0.2	198	No	0.04
	65	204	192	No	0.33	197	No	0.32	201	No	0.2
	70	204	194	No	0.41	199	No	0.41	203	No	0.39
	75	204	197	Yes	0.5	202	Yes	0.55	206	Yes	0.72
	80	204	200	Yes	0.63	205	Yes	0.64	209	Yes	0.92
	85	204	204	Yes	0.75	209	Yes	0.8	213	Yes	0.99
	90	204	208	Yes	0.87	213	Yes	0.88	217	Yes	>0.99
	95	204	215	Yes	0.96	220	Yes	0.98	224	Yes	>0.99
4	5	210	166	No	<0.01	170	No	<0.01	173	No	<0.01
	10	210	173	No	<0.01	177	No	<0.01	179	No	<0.01
	15	210	177	No	<0.01	181	No	<0.01	184	No	<0.01
	20	210	181	No	0.01	184	No	<0.01	187	No	<0.01
	25	210	184	No	0.02	187	No	0.01	190	No	<0.01
	30	210	186	No	0.02	190	No	0.02	193	No	<0.01
	35	210	189	No	0.05	193	No	0.04	195	No	<0.01
	40	210	191	No	0.08	195	No	0.07	198	No	<0.01
	45	210	194	No	0.12	197	No	0.1	200	No	<0.01
	50	210	196	No	0.17	199	No	0.16	202	No	0.01
	55	210	198	No	0.24	202	No	0.23	204	No	0.04
	60	210	200	No	0.32	204	No	0.31	207	No	0.2
	65	210	203	No	0.41	206	No	0.4	209	No	0.39
	70	210	205	Yes	0.5	209	Yes	0.55	211	Yes	0.61
	75	210	208	Yes	0.64	211	Yes	0.6	214	Yes	0.87
	80	210	211	Yes	0.72	214	Yes	0.73	217	Yes	0.98
	85	210	215	Yes	0.86	218	Yes	0.87	220	Yes	>0.99

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	90	210	219	Yes	0.92	222	Yes	0.95	225	Yes	>0.99
	95	210	226	Yes	0.98	229	Yes	0.99	231	Yes	>0.99
5	5	215	175	No	<0.01	178	No	<0.01	180	No	<0.01
	10	215	181	No	<0.01	184	No	<0.01	186	No	<0.01
	15	215	186	No	<0.01	189	No	<0.01	191	No	<0.01
	20	215	189	No	0.01	192	No	0.01	194	No	<0.01
	25	215	192	No	0.02	195	No	0.01	197	No	<0.01
	30	215	195	No	0.04	197	No	0.03	199	No	<0.01
	35	215	197	No	0.07	200	No	0.06	202	No	<0.01
	40	215	199	No	0.09	202	No	0.1	204	No	<0.01
	45	215	201	No	0.14	204	No	0.12	206	No	0.01
	50	215	204	No	0.23	206	No	0.18	208	No	0.02
	55	215	206	No	0.27	209	No	0.3	211	No	0.13
	60	215	208	No	0.36	211	No	0.35	213	No	0.28
	65	215	210	No	0.45	213	No	0.45	215	Yes	0.5
	70	215	213	Yes	0.55	215	Yes	0.55	217	Yes	0.72
	75	215	215	Yes	0.64	218	Yes	0.7	220	Yes	0.92
	80	215	218	Yes	0.77	221	Yes	0.82	223	Yes	0.99
	85	215	222	Yes	0.86	224	Yes	0.9	226	Yes	>0.99
	90	215	226	Yes	0.94	228	Yes	0.96	230	Yes	>0.99
	95	215	232	Yes	0.99	235	Yes	>0.99	237	Yes	>0.99
6	5	220	181	No	<0.01	183	No	<0.01	185	No	<0.01
	10	220	187	No	<0.01	189	No	<0.01	191	No	<0.01
	15	220	191	No	<0.01	193	No	<0.01	195	No	<0.01
	20	220	195	No	0.01	197	No	0.01	198	No	<0.01
	25	220	198	No	0.02	199	No	0.01	201	No	<0.01
	30	220	200	No	0.03	202	No	0.02	203	No	<0.01
	35	220	202	No	0.04	204	No	0.04	206	No	<0.01

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	40	220	205	No	0.09	206	No	0.06	208	No	<0.01
	45	220	207	No	0.11	209	No	0.13	210	No	<0.01
	50	220	209	No	0.16	211	No	0.16	212	No	0.01
	55	220	211	No	0.23	213	No	0.22	214	No	0.04
	60	220	213	No	0.31	215	No	0.31	216	No	0.13
	65	220	215	No	0.36	217	No	0.4	218	No	0.28
	70	220	218	Yes	0.5	219	Yes	0.5	221	Yes	0.61
	75	220	220	Yes	0.6	222	Yes	0.65	223	Yes	0.8
	80	220	223	Yes	0.73	225	Yes	0.78	226	Yes	0.96
	85	220	226	Yes	0.84	228	Yes	0.87	229	Yes	0.99
	90	220	231	Yes	0.94	232	Yes	0.95	233	Yes	>0.99
	95	220	237	Yes	0.99	238	Yes	0.99	239	Yes	>0.99
7	5	222	185	No	<0.01	186	No	<0.01	187	No	<0.01
	10	222	191	No	<0.01	192	No	<0.01	193	No	<0.01
	15	222	195	No	0.01	196	No	<0.01	197	No	<0.01
	20	222	198	No	0.01	200	No	0.01	201	No	<0.01
	25	222	201	No	0.02	202	No	0.01	203	No	<0.01
	30	222	204	No	0.05	205	No	0.03	206	No	<0.01
	35	222	206	No	0.06	207	No	0.06	208	No	<0.01
	40	222	208	No	0.1	210	No	0.11	211	No	<0.01
	45	222	210	No	0.15	212	No	0.14	213	No	0.01
	50	222	212	No	0.21	214	No	0.2	215	No	0.02
	55	222	214	No	0.24	216	No	0.27	217	No	0.08
	60	222	217	No	0.36	218	No	0.36	219	No	0.2
	65	222	219	No	0.45	220	No	0.45	221	No	0.39
	70	222	221	Yes	0.55	223	Yes	0.6	224	Yes	0.72
	75	222	224	Yes	0.68	225	Yes	0.69	226	Yes	0.87
	80	222	226	Yes	0.76	228	Yes	0.8	229	Yes	0.98

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	85	222	230	Yes	0.88	231	Yes	0.89	232	Yes	>0.99
	90	222	234	Yes	0.95	235	Yes	0.96	237	Yes	>0.99
	95	222	240	Yes	0.99	241	Yes	0.99	243	Yes	>0.99
8	5	226	188	No	<0.01	189	No	<0.01	190	No	<0.01
	10	226	194	No	<0.01	195	No	<0.01	196	No	<0.01
	15	226	198	No	<0.01	199	No	<0.01	200	No	<0.01
	20	226	201	No	0.01	203	No	0.01	203	No	<0.01
	25	226	204	No	0.02	205	No	0.01	206	No	<0.01
	30	226	207	No	0.04	208	No	0.03	209	No	<0.01
	35	226	209	No	0.06	210	No	0.05	211	No	<0.01
	40	226	211	No	0.09	213	No	0.08	213	No	<0.01
	45	226	214	No	0.13	215	No	0.12	216	No	<0.01
	50	226	216	No	0.18	217	No	0.17	218	No	0.01
	55	226	218	No	0.25	219	No	0.24	220	No	0.04
	60	226	220	No	0.33	221	No	0.32	222	No	0.13
	65	226	222	No	0.41	223	No	0.41	224	No	0.28
	70	226	225	Yes	0.55	226	Yes	0.55	227	Yes	0.61
	75	226	227	Yes	0.63	228	Yes	0.64	229	Yes	0.8
	80	226	230	Yes	0.75	231	Yes	0.76	232	Yes	0.96
	85	226	233	Yes	0.85	235	Yes	0.88	236	Yes	>0.99
	90	226	238	Yes	0.94	239	Yes	0.95	240	Yes	>0.99
	95	226	244	Yes	0.99	245	Yes	0.99	246	Yes	>0.99

Table 3.9. Proficiency Projection Based on RIT Scores—Mathematics

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
2	5	200	147	No	<0.01	155	No	<0.01	161	No	<0.01
	10	200	153	No	<0.01	161	No	<0.01	167	No	<0.01
	15	200	157	No	<0.01	165	No	<0.01	171	No	<0.01
	20	200	160	No	<0.01	168	No	<0.01	174	No	<0.01
	25	200	162	No	<0.01	171	No	<0.01	177	No	<0.01
	30	200	165	No	0.01	173	No	<0.01	179	No	<0.01
	35	200	167	No	0.01	175	No	0.01	181	No	<0.01
	40	200	169	No	0.03	177	No	0.02	183	No	<0.01
	45	200	171	No	0.04	179	No	0.02	185	No	<0.01
	50	200	173	No	0.07	181	No	0.04	187	No	<0.01
	55	200	175	No	0.09	183	No	0.07	189	No	<0.01
	60	200	177	No	0.14	185	No	0.12	192	No	0.01
	65	200	179	No	0.2	187	No	0.18	194	No	0.04
	70	200	181	No	0.27	189	No	0.21	196	No	0.13
	75	200	183	No	0.36	192	No	0.35	198	No	0.28
	80	200	186	No	0.45	194	No	0.45	201	Yes	0.61
	85	200	189	Yes	0.6	197	Yes	0.6	204	Yes	0.87
	90	200	193	Yes	0.73	201	Yes	0.75	208	Yes	0.99
	95	200	198	Yes	0.89	207	Yes	0.93	214	Yes	>0.99
3	5	211	158	No	<0.01	166	No	<0.01	171	No	<0.01
	10	211	164	No	<0.01	172	No	<0.01	177	No	<0.01
	15	211	168	No	<0.01	176	No	<0.01	181	No	<0.01
	20	211	171	No	<0.01	179	No	<0.01	185	No	<0.01
	25	211	174	No	<0.01	182	No	<0.01	188	No	<0.01
	30	211	176	No	0.01	184	No	<0.01	190	No	<0.01
	35	211	178	No	0.01	186	No	0.01	193	No	<0.01
	40	211	180	No	0.02	189	No	0.02	195	No	<0.01

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	45	211	182	No	0.04	191	No	0.04	197	No	<0.01
	50	211	184	No	0.06	193	No	0.05	199	No	<0.01
	55	211	186	No	0.1	195	No	0.08	201	No	<0.01
	60	211	188	No	0.15	197	No	0.13	203	No	0.01
	65	211	190	No	0.22	199	No	0.2	206	No	0.08
	70	211	192	No	0.3	201	No	0.29	208	No	0.2
	75	211	195	No	0.45	204	No	0.45	211	Yes	0.5
	80	211	197	Yes	0.55	206	Yes	0.55	213	Yes	0.72
	85	211	200	Yes	0.7	210	Yes	0.71	217	Yes	0.96
	90	211	204	Yes	0.85	214	Yes	0.87	221	Yes	>0.99
	95	211	210	Yes	0.95	220	Yes	0.97	227	Yes	>0.99
4	5	227	171	No	<0.01	176	No	<0.01	180	No	<0.01
	10	227	177	No	<0.01	183	No	<0.01	187	No	<0.01
	15	227	181	No	<0.01	187	No	<0.01	191	No	<0.01
	20	227	184	No	<0.01	190	No	<0.01	195	No	<0.01
	25	227	186	No	<0.01	193	No	<0.01	198	No	<0.01
	30	227	189	No	<0.01	196	No	<0.01	201	No	<0.01
	35	227	191	No	<0.01	198	No	<0.01	203	No	<0.01
	40	227	193	No	<0.01	200	No	<0.01	206	No	<0.01
	45	227	195	No	0.01	202	No	<0.01	208	No	<0.01
	50	227	197	No	0.02	204	No	0.01	210	No	<0.01
	55	227	199	No	0.03	207	No	0.02	212	No	<0.01
	60	227	201	No	0.05	209	No	0.03	215	No	<0.01
	65	227	203	No	0.09	211	No	0.06	217	No	<0.01
	70	227	205	No	0.13	213	No	0.1	220	No	0.02
	75	227	208	No	0.23	216	No	0.2	222	No	0.08
	80	227	210	No	0.31	219	No	0.33	225	No	0.28
	85	227	214	Yes	0.5	222	Yes	0.5	229	Yes	0.72

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	90	227	217	Yes	0.65	226	Yes	0.72	233	Yes	0.96
	95	227	223	Yes	0.87	232	Yes	0.92	240	Yes	>0.99
5	5	231	180	No	<0.01	183	No	<0.01	186	No	<0.01
	10	231	185	No	<0.01	189	No	<0.01	192	No	<0.01
	15	231	189	No	<0.01	194	No	<0.01	197	No	<0.01
	20	231	193	No	<0.01	197	No	<0.01	200	No	<0.01
	25	231	195	No	<0.01	200	No	<0.01	204	No	<0.01
	30	231	198	No	<0.01	203	No	<0.01	206	No	<0.01
	35	231	200	No	<0.01	205	No	<0.01	209	No	<0.01
	40	231	202	No	0.01	207	No	<0.01	211	No	<0.01
	45	231	204	No	0.01	210	No	0.01	214	No	<0.01
	50	231	206	No	0.03	212	No	0.02	216	No	<0.01
	55	231	208	No	0.05	214	No	0.03	218	No	<0.01
	60	231	210	No	0.08	216	No	0.06	221	No	<0.01
	65	231	212	No	0.12	219	No	0.13	223	No	0.01
	70	231	215	No	0.22	221	No	0.2	226	No	0.08
	75	231	217	No	0.3	224	No	0.33	228	No	0.2
	80	231	220	No	0.45	226	No	0.44	232	Yes	0.61
	85	231	223	Yes	0.6	230	Yes	0.67	235	Yes	0.87
	90	231	227	Yes	0.78	234	Yes	0.84	240	Yes	0.99
	95	231	233	Yes	0.95	240	Yes	0.97	246	Yes	>0.99
6	5	238	184	No	<0.01	187	No	<0.01	190	No	<0.01
	10	238	190	No	<0.01	194	No	<0.01	197	No	<0.01
	15	238	194	No	<0.01	198	No	<0.01	201	No	<0.01
	20	238	197	No	<0.01	201	No	<0.01	205	No	<0.01
	25	238	199	No	<0.01	204	No	<0.01	208	No	<0.01
	30	238	202	No	<0.01	207	No	<0.01	211	No	<0.01
	35	238	204	No	<0.01	209	No	<0.01	213	No	<0.01

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	40	238	206	No	<0.01	212	No	<0.01	216	No	<0.01
	45	238	208	No	0.01	214	No	<0.01	218	No	<0.01
	50	238	210	No	0.01	216	No	0.01	220	No	<0.01
	55	238	212	No	0.02	218	No	0.01	223	No	<0.01
	60	238	214	No	0.04	220	No	0.03	225	No	<0.01
	65	238	216	No	0.07	223	No	0.07	227	No	<0.01
	70	238	219	No	0.13	225	No	0.11	230	No	0.01
	75	238	221	No	0.23	228	No	0.21	233	No	0.08
	80	238	224	No	0.36	231	No	0.34	236	No	0.28
	85	238	227	Yes	0.5	234	Yes	0.5	239	Yes	0.61
	90	238	231	Yes	0.69	238	Yes	0.71	244	Yes	0.96
	95	238	237	Yes	0.89	245	Yes	0.93	251	Yes	>0.99
7	5	242	189	No	<0.01	191	No	<0.01	192	No	<0.01
	10	242	195	No	<0.01	197	No	<0.01	199	No	<0.01
	15	242	199	No	<0.01	202	No	<0.01	204	No	<0.01
	20	242	203	No	<0.01	206	No	<0.01	208	No	<0.01
	25	242	206	No	<0.01	209	No	<0.01	211	No	<0.01
	30	242	208	No	<0.01	211	No	<0.01	214	No	<0.01
	35	242	211	No	<0.01	214	No	<0.01	216	No	<0.01
	40	242	213	No	<0.01	216	No	<0.01	219	No	<0.01
	45	242	215	No	0.01	219	No	<0.01	221	No	<0.01
	50	242	217	No	0.01	221	No	0.01	224	No	<0.01
	55	242	219	No	0.03	223	No	0.02	226	No	<0.01
	60	242	222	No	0.06	226	No	0.04	229	No	<0.01
	65	242	224	No	0.09	228	No	0.07	231	No	<0.01
	70	242	226	No	0.14	231	No	0.12	234	No	0.01
	75	242	229	No	0.23	233	No	0.18	237	No	0.08
	80	242	232	No	0.36	236	No	0.3	240	No	0.28

Grade	Start Percentile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Met	Prob.		Met	Prob.		Met	Prob.
	85	242	235	Yes	0.5	240	Yes	0.5	244	Yes	0.72
	90	242	239	Yes	0.69	245	Yes	0.74	249	Yes	0.98
	95	242	246	Yes	0.91	251	Yes	0.93	256	Yes	>0.99
8	5	246	192	No	<0.01	194	No	<0.01	196	No	<0.01
	10	246	199	No	<0.01	201	No	<0.01	203	No	<0.01
	15	246	203	No	<0.01	206	No	<0.01	208	No	<0.01
	20	246	207	No	<0.01	210	No	<0.01	212	No	<0.01
	25	246	210	No	<0.01	213	No	<0.01	215	No	<0.01
	30	246	212	No	<0.01	216	No	<0.01	218	No	<0.01
	35	246	215	No	<0.01	219	No	<0.01	221	No	<0.01
	40	246	217	No	0.01	221	No	<0.01	224	No	<0.01
	45	246	220	No	0.01	224	No	0.01	226	No	<0.01
	50	246	222	No	0.03	226	No	0.02	229	No	<0.01
	55	246	224	No	0.04	228	No	0.03	231	No	<0.01
	60	246	227	No	0.08	231	No	0.07	234	No	<0.01
	65	246	229	No	0.13	233	No	0.1	237	No	0.01
	70	246	232	No	0.21	236	No	0.19	239	No	0.02
	75	246	234	No	0.28	239	No	0.26	242	No	0.13
	80	246	237	No	0.41	242	No	0.4	246	Yes	0.5
	85	246	241	Yes	0.59	246	Yes	0.6	250	Yes	0.87
	90	246	246	Yes	0.79	251	Yes	0.81	255	Yes	0.99
	95	246	252	Yes	0.93	258	Yes	0.96	262	Yes	>0.99

References

- Colorado Department of Education (CDE). (2018). *2018 CMAS English language arts/literacy and mathematics state achievement results*. Retrieved from https://www.cde.state.co.us/assessment/2018_cmas_ela_math_state_summary_achievement_results.
- Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking: Methods and practices* (2nd ed.). Springer. <https://doi.org/10.1007/978-1-4939-0317-7>
- Lewis, K., & Kuhfeld, M. (2024). *MAP Growth with enhanced item-selection algorithm: Updates on score comparability*. NWEA Research Report. NWEA. https://www.nwea.org/uploads/Research-MAP-Growth-with-enhanced-item-selection-algorithm-updates-on-score-compatibility_NWEA_Research_Guide.pdf
- Lumley, T. (2019). *Survey: Analysis of complex survey samples*. (R package version 3.36) [Computer software]. Available from <https://CRAN.R-project.org/package=survey>.
- Meyer, J. P., Hu, A. H., & Li, S. (2023). *Content Proximity Spring 2022 Pilot Study Research Brief*. NWEA Research Report. NWEA. <https://www.nwea.org/uploads/Content-Proximity-Project-and-Pilot-Study-Spring-2022-Research-Report.pdf>
- NWEA. (2025). *MAP Growth achievement status and growth norms for students and schools*. [Tech Rep.]. NWEA.
- Pommerich, M., Hanson, B., Harris, D., & Sconing, J. (2004). Issues in conducting linkage between distinct tests. *Applied Psychological Measurement*, 28(4), 247–273. <https://doi.org/10.1177/0146621604265033>