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

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NWEA Psychometric Solutions

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Executive Summary

To predict student achievement on the Smarter Balanced Assessment Consortium (SBAC) summative assessments in Grades 3–8 in 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 SBAC achievement levels. Educators can use the RIT score cuts to identify students at risk of not meeting state proficiency standards early in the year and provide tailored educational interventions.[1] The linking study has been updated since the previous version published in July 2017 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020).

This linking study is based on data from the following nine states: California, Connecticut, Delaware, Hawaii, Idaho, Nevada, Oregon, South Dakota, and Washington. Although any of these nine states could use the results of this report, it is recommended for states to reference their state-specific linking study results if available (i.e., California, Nevada, Oregon, South Dakota, Washington). Caution should be taken when applying the results to SBAC states that had no data included in this study (e.g., Montana, Vermont).[2] The accuracy of using the cut scores in this report for states not included in the study is unknown.

Table E.1 presents the 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 SBAC Grade 3 ELA test is 2432. A Grade 3 student with a MAP Growth Reading RIT score of 189 in the fall is likely to meet proficiency on the SBAC ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 189 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 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 SBAC Proficiency

Content Area	Assessment		*Level 3* Cut Scores by Grade						
			2	3	4	5	6	7	8
ELA/Reading	SBAC Spring		–	2432	2473	2502	2531	2552	2567
	MAP Growth	Fall	175	189	198	204	211	214	218
		Winter	184	196	204	209	214	217	221
		Spring	188	199	206	211	216	218	222
Mathematics	SBAC Spring		–	2436	2485	2528	2552	2567	2586
	MAP Growth	Fall	175	188	202	214	219	225	232
		Winter	184	196	209	220	224	229	235
		Spring	189	201	213	224	227	232	237

[1] This study provides MAP Growth cut scores that predict proficiency on the SBAC test 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).
[2] The data collected from Michigan could not be used in this study because the state scale scores are not on the SBAC scale. As a result, Michigan should refer to its own linking study results.

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 SBAC Grades 3–8 ELA and Mathematics summative tests are aligned to the Common Core State Standards (CCSS) and are administered in multiple states as their end-of-year state summative assessment. 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 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 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 SBAC assessments in Spring 2019 were included in the study sample. Table E.2 presents the weighted number of students from 59 districts and 465 schools across states 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 student population in terms of race, sex, achievement level, and state student participation distributions, weighting (i.e., a statistical method that matches the distributions of the variables of interest to those of the target population) was applied to the sample. As a result, the RIT cuts derived from the study sample can be generalized to any student from the target population. All analyses in this study for Grades 3–8 were conducted based on the weighted sample.

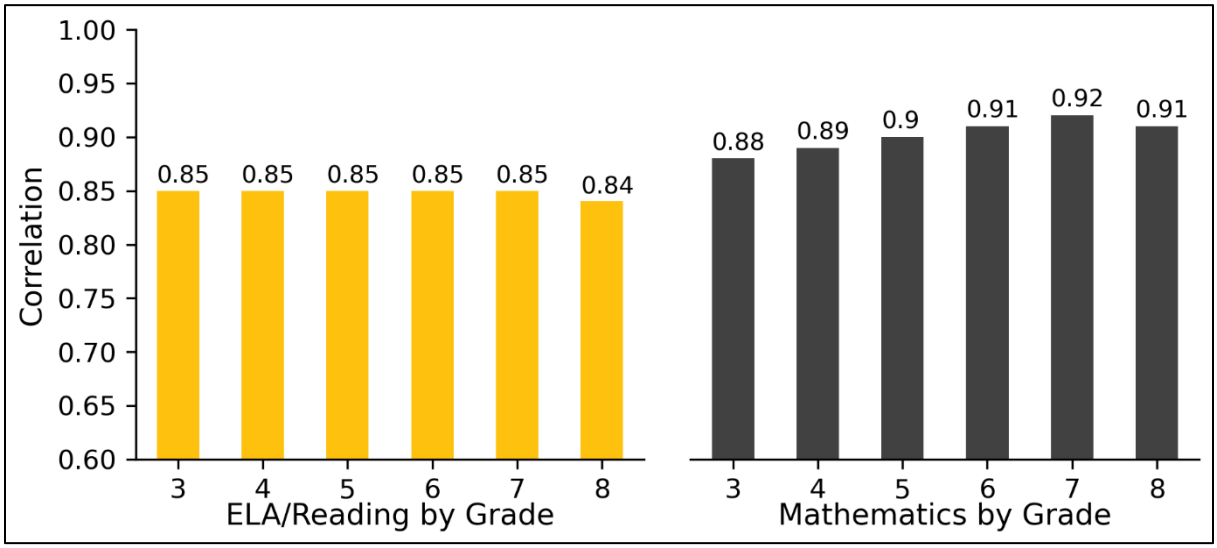
Table E.2. Linking Study Sample

	#Students	
Grade	ELA/Reading	Mathematics
3	17,349	18,496
4	17,013	18,616
5	17,538	19,276
6	16,029	17,857
7	15,414	17,371
8	13,865	14,981

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and SBAC scores range from 0.84 to 0.92 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 SBAC summative assessments.

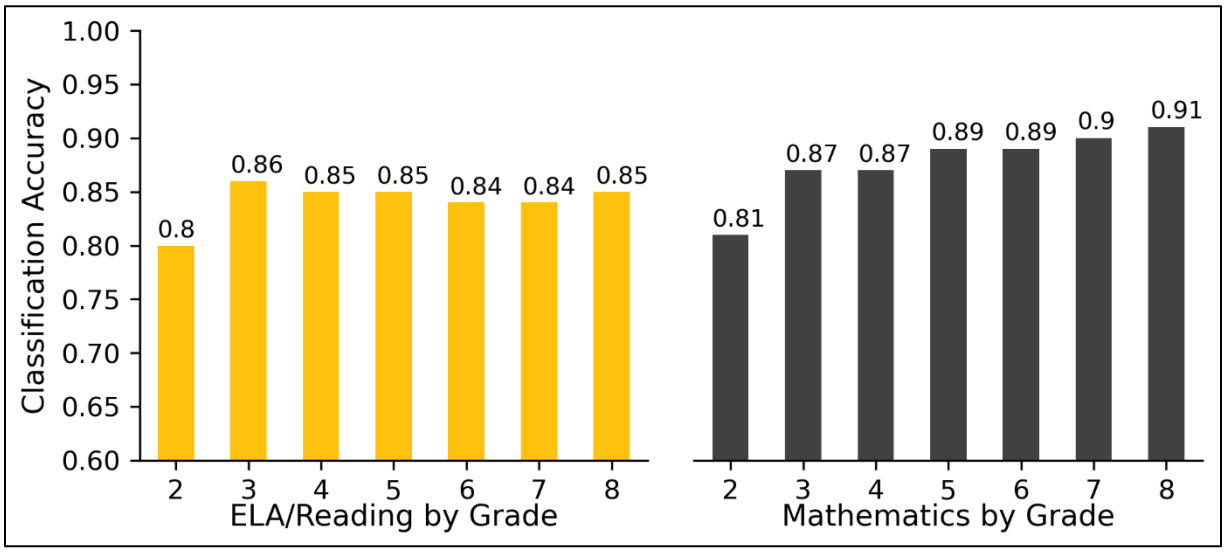
Figure E.1. Correlations between MAP Growth and SBAC Test Scores



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 SBAC summative tests. For example, the MAP Growth Reading Grade 3 *Level 3* cut score has a 0.86 accuracy rate, meaning it accurately classified student achievement on the state test for 86% of the sample. The results range from 0.80 to 0.91 across content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the 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 Smarter Balanced Assessment Consortium (SBAC) Grades 3–8 English Language Arts/Literacy (ELA) and Mathematics summative assessments with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2019 term. This is a multi-state study that includes data from California, Connecticut, Delaware, Hawaii, Idaho, Nevada, Oregon, South Dakota, and Washington. The linking study has been updated since the previous version published in July 2017 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020). In this updated study, MAP Growth cut scores are also included for Grade 2 so educators can track early learners' progress toward proficiency on the SBAC summative assessment 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 SBAC achievement levels using the equipercentile linking procedure for spring results and the 2020 norms for fall and winter
4. Classification accuracy statistics to determine the degree to which MAP Growth accurately predicts student proficiency status on the SBAC summative tests
5. The probability of achieving grade-level proficiency on the SBAC assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The SBAC Grades 3–8 ELA and Mathematics summative assessments are aligned to the Common Core State Standards (CCSS) and are administered in multiple states. 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 SBAC assessments. NWEA recruited 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.[3] 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 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, achievement level, and state student participation. 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, achievement level, and state student participation 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 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 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 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

[3] The exception is Clark County in Nevada that did its own matching and provided NWEA the merged data file.

represent a score on Test X (e.g., 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:

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

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

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

where:

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

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

2.4. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the 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 SBAC data for the *Level 3* cut score.

Students generally do not begin taking the state summative assessment until Grade 3, so longitudinal data were collected for the Grade 3 cohort to link the SBAC summative assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. To accomplish this, 2018–2019 SBAC Grade 3 results were linked to MAP Growth data from Grade 3 students in 2018–2019 and Grade 2 students in 2017–2018. In this way, the data came from the same cohort of students beginning when they were in Grade 2 and continuing through Grade 3.

Table 2.1. Description of Classification Accuracy Summary Statistics

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

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

2.5. Proficiency Projection

In addition to calculating the MAP Growth fall and winter cut scores, the MAP Growth conditional growth norms data were also used to calculate the probability of reaching proficiency on the 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 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 SBAC summative assessment 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 SBAC assessments in Spring 2019 were included in the study sample. Data used in this study were collected from 59 districts and 465 schools across nine SBAC states. Table 3.1 presents the demographic distributions of race, sex, achievement level, and state student participation in the original unweighted study sample. Table 3.2 presents the distributions of the student population from nine states that took the Spring 2019 SBAC summative assessments. Since the unweighted data are different from the SBAC student 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 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	17,349	17,013	17,538	16,029	15,414	13,865
Race*	AI/AN	6.3	6.5	6.9	7.5	8.4	8.0
	Asian	5.9	5.9	6.1	5.4	5.3	5.8
	Black	7.2	7.4	6.8	6.7	6.9	6.8
	Hispanic	32.1	32.3	28.5	29.3	29.1	28.5
	Multi-Race	5.8	5.5	5.5	5.0	4.9	4.4
	NH/PI	1.7	1.6	1.8	1.8	2.0	2.3
	White	41.0	40.9	44.5	44.2	43.3	44.3
Sex	Female	49.2	49.2	48.8	48.8	48.5	48.9
	Male	50.8	50.8	51.2	51.2	51.5	51.1
Achievement Level	*Level 1*	30.1	33.3	28.3	25.8	24.9	23.7
	Level 2	24.8	20.8	20.2	27.3	24.5	27.1
	Level 3	22.0	23.3	29.2	31.5	34.5	33.7
	Level 4	23.1	22.6	22.3	15.4	16.1	15.5
State Student Participation	California	42.4	41.3	37.6	36.0	36.5	36.1
	Connecticut	0.7	0.6	0.6	0.4	0.8	0.7
	Delaware	0.4	0.5	1.3	1.5	1.4	1.5
	Hawaii	0.1	0.1	0.1	0.1	0.0	0.1
	Idaho	0.9	3.4	3.4	4.2	3.3	3.7
	Nevada	17.3	16.1	17.6	19.1	19.2	18.9
	Oregon	11.3	11.8	10.4	8.2	8.1	7.6
	South Dakota	16.8	17.2	16.4	17.5	17.7	18.1
	Washington	10.1	9.1	12.7	13.0	13.0	13.3

Linking Study Sample (Unweighted)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
Mathematics							
	Total N	18,496	18,616	19,276	17,857	17,371	14,981
Race*	AI/AN	6.0	6.0	6.4	6.1	7.0	6.7
	Asian	6.0	6.6	6.9	5.7	6.6	5.9
	Black	8.0	8.3	7.6	6.2	6.1	6.1
	Hispanic	30.1	29.7	26.9	28.1	26.9	28.4
	Multi-Race	6.3	6.2	6.1	6.0	5.9	5.4
	NH/PI	1.4	1.5	1.7	1.2	1.7	1.5
	White	42.1	41.8	44.4	46.7	45.8	46.0
Sex	Female	49.1	49.2	48.7	48.7	48.4	48.5
	Male	50.9	50.8	51.3	51.3	51.6	51.5
Achievement Level	*Level 1*	27.8	25.0	33.5	32.1	31.9	37.1
	Level 2	23.6	31.7	27.6	29.2	25.8	23.4
	Level 3	28.	26.0	18.3	19.4	21.6	17.5
	Level 4	20.6	17.3	20.6	19.3	20.6	22.0
State Student Participation	California	38.0	37.4	34.9	29.1	32.2	31.0
	Connecticut	0.7	0.6	0.5	0.4	0.7	0.7
	Delaware	0.3	0.4	1.2	1.4	1.3	1.4
	Hawaii	0.1	0.1	0.1	0.1	0.0	0.1
	Idaho	0.8	0.6	0.9	3.7	2.9	3.4
	Nevada	13.7	14.8	16.0	17.6	17.3	17.0
	Oregon	18.3	18.6	17.4	18.3	16.6	17.5
	South Dakota	16.0	15.7	14.8	15.8	15.7	15.9
	Washington	12.2	11.8	14.2	13.6	13.3	13.0

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

Table 3.2. Spring 2019 SBAC Linking Study Sample Student Population Demographics

Spring 2019 SBAC Linking Study Sample Population							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA							
	Total N	698,462	694,712	724,149	726,791	733,493	717,832
Race*	AI/AN	0.8	0.9	0.9	0.9	0.9	0.9
	Asian	8.1	7.9	8.2	8.1	8.2	8.5
	Black	5.8	5.9	5.9	5.8	5.8	5.8
	Hispanic	44.2	44.3	44.4	44.5	44.8	44.1
	Multi-Race	5.6	5.4	5.2	5.0	4.8	4.4
	NH/PI	2.2	2.2	2.3	2.3	2.5	2.7
	White	32.7	33.0	32.7	33.0	32.7	33.2
Sex	Female	49.0	48.8	48.7	48.8	49.0	48.9
	Male	51.0	51.2	51.3	51.2	51.0	51.1

Spring 2019 SBAC Linking Study Sample Population							
		%Students by Grade					
Demographic Subgroup		**3**	**4**	**5**	**6**	**7**	**8**
Achievement Level	*Level 1*	26.9	29.9	26.7	24.1	24.7	24.1
	Level 2	23.4	19.3	19.6	24.5	22.1	24.6
	Level 3	22.7	23.1	29.1	32.0	34.4	33.6
	Level 4	27.0	27.8	24.6	19.3	18.9	17.7
State Student Participation	California	63.4	62.7	62.8	62.9	64.3	64.3
	Connecticut	5.2	5.4	5.3	5.4	5.3	5.5
	Delaware	1.5	1.5	1.5	1.5	1.4	1.4
	Hawaii	2.0	1.6	2.0	1.9	1.8	1.7
	Idaho	3.3	3.4	3.4	3.4	3.3	3.3
	Nevada	5.2	5.3	5.3	5.4	5.1	5.1
	Oregon	6.1	6.3	6.2	6.1	5.9	5.8
	South Dakota	1.6	1.6	1.6	1.6	1.5	1.5
	Washington	11.8	12.2	12.0	11.8	11.4	11.3
Mathematics							
	Total N	700,790	696,880	725,859	728,323	734,697	718,210
Race*	AI/AN	0.8	0.9	0.9	0.9	0.9	0.9
	Asian	8.2	8.0	8.2	8.2	8.2	8.6
	Black	5.8	5.9	5.9	5.8	5.8	5.8
	Hispanic	44.3	44.3	44.5	44.5	44.8	44.2
	Multi-Race	5.5	5.4	5.2	5.0	4.8	4.4
	NH/PI	2.2	2.2	2.3	2.3	2.5	2.7
	White	32.6	32.9	32.6	32.9	32.7	33.1
Sex	Female	49.0	48.8	48.7	48.8	48.9	48.9
	Male	51.0	51.2	51.3	51.2	51.1	51.1
Achievement Level	*Level 1*	25.8	23.3	33.1	32.6	34.2	38.7
	Level 2	22.7	29.9	26.7	27.6	25.8	23.1
	Level 3	28.1	25.9	17.7	19.4	19.7	16.7
	Level 4	23.3	20.9	22.5	20.5	20.2	21.5
State Student Participation	California	63.5	62.8	62.9	63.0	64.4	64.4
	Connecticut	5.2	5.4	5.3	5.4	5.3	5.5
	Delaware	1.5	1.5	1.5	1.5	1.4	1.4
	Hawaii	2.0	1.6	2.0	1.9	1.8	1.7
	Idaho	3.3	3.4	3.4	3.4	3.3	3.3
	Nevada	5.2	5.3	5.3	5.4	5.1	5.1
	Oregon	6.0	6.2	6.2	6.1	5.8	5.8
	South Dakota	1.6	1.6	1.6	1.6	1.5	1.5
	Washington	11.8	12.2	11.9	11.8	11.3	11.3

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

Table 3.3. Linking Study Sample Demographics (Weighted)

Linking Study Sample (Weighted)							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA/Reading							
	Total N	17,349	17,013	17,538	16,029	15,414	13,865
Race*	AI/AN	0.8	0.9	0.9	0.9	0.9	0.9
	Asian	8.2	8.0	8.2	8.1	8.2	8.5
	Black	5.9	6.0	6.0	5.9	5.8	5.8
	Hispanic	44.4	44.5	44.5	44.6	44.9	44.3
	Multi-Race	5.6	5.4	5.3	5.1	4.8	4.4
	NH/PI	2.3	2.2	2.3	2.3	2.5	2.7
	White	32.8	33.2	32.8	33.1	32.9	33.3
Sex	Female	49.0	48.8	48.7	48.8	49.0	48.9
	Male	51.0	51.2	51.3	51.2	51.0	51.1
Achievement Level	*Level 1*	26.9	29.9	26.7	24.1	24.7	24.1
	Level 2	23.4	19.3	19.6	24.5	22.1	24.6
	Level 3	22.7	23.1	29.1	32.0	34.4	33.6
	Level 4	27.0	27.8	24.6	19.3	18.9	17.7
State Student Participation	California	63.4	62.7	62.8	62.9	64.3	64.3
	Connecticut	5.2	5.4	5.3	5.4	5.3	5.5
	Delaware	1.5	1.5	1.5	1.5	1.4	1.4
	Hawaii	2.0	1.6	2.0	1.9	1.8	1.7
	Idaho	3.3	3.4	3.4	3.4	3.3	3.3
	Nevada	5.2	5.3	5.3	5.4	5.1	5.1
	Oregon	6.1	6.3	6.2	6.1	5.9	5.8
	South Dakota	1.6	1.6	1.6	1.6	1.5	1.5
	Washington	11.8	12.2	12.0	11.8	11.4	11.3
Mathematics							
	Total N	18,496	18,616	19,276	17,857	17,371	14,981
Race*	AI/AN	0.8	0.9	0.9	0.9	0.9	0.9
	Asian	8.2	8.1	8.3	8.2	8.3	8.6
	Black	5.9	5.9	5.9	5.9	5.8	5.8
	Hispanic	44.5	44.5	44.6	44.7	45.0	44.4
	Multi-Race	5.6	5.4	5.2	5.0	4.8	4.4
	NH/PI	2.3	2.2	2.3	2.3	2.5	2.7
	White	32.7	33.1	32.7	33.0	32.8	33.3
Sex	Female	49.0	48.8	48.7	48.8	48.9	48.9
	Male	51.0	51.2	51.3	51.2	51.1	51.1
Achievement Level	*Level 1*	25.8	23.3	33.1	32.6	34.3	38.7
	Level 2	22.8	29.9	26.7	27.6	25.8	23.1
	Level 3	28.1	25.9	17.7	19.4	19.7	16.7
	Level 4	23.3	20.9	22.5	20.5	20.2	21.5

Linking Study Sample (Weighted)							
Demographic Subgroup		%Students by Grade					
		3	4	5	6	7	8
State Student Participation	California	63.5	62.8	62.9	63.0	64.4	64.4
	Connecticut	5.2	5.4	5.3	5.4	5.3	5.5
	Delaware	1.5	1.5	1.5	1.5	1.4	1.4
	Hawaii	2.0	1.6	2.0	1.9	1.8	1.7
	Idaho	3.3	3.4	3.4	3.4	3.3	3.3
	Nevada	5.2	5.3	5.3	5.4	5.1	5.1
	Oregon	6.0	6.2	6.2	6.1	5.8	5.8
	South Dakota	1.6	1.6	1.6	1.6	1.5	1.5
	Washington	11.8	12.2	11.9	11.8	11.3	11.3

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

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and SBAC test scores from Spring 2019, including the correlation coefficient (*r*) between them. The coefficients between the scores range from 0.84 to 0.85 for ELA/reading and 0.88 to 0.92 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 SBAC summative assessments.

Table 3.4. Descriptive Statistics of Test Scores

			SBAC*				MAP Growth*			
Grade	N	*r*	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	17,349	0.85	2426.7	90.9	2114	2702	197.4	16.5	138	251
4	17,013	0.85	2469.0	95.8	2131	2761	204.5	16.1	144	256
5	17,538	0.85	2505.5	99.2	2142	2787	210.2	16.0	145	266
6	16,029	0.85	2526.2	99.5	2135	2891	214.4	16.6	154	267
7	15,414	0.85	2551.1	103.8	1941	2879	216.6	17.3	151	266
8	13,865	0.84	2564.4	103.4	1225	2874	220.3	17.2	147	285
Mathematics										
3	18,496	0.88	2436.6	83.7	2097	2762	200.6	14.7	133	275
4	18,616	0.89	2475.3	85.0	2090	2796	210.2	16.0	131	275
5	19,276	0.90	2499.6	95.6	1623	2871	217.8	18.2	128	288
6	17,857	0.91	2516.1	111.9	1985	2924	221.1	18.4	157	317
7	17,371	0.92	2530.9	117.7	1232	3042	225.1	20.5	152	302
8	14,981	0.91	2544.4	125.4	2113	2993	230.0	21.4	153	304

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

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the 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 SBAC spring summative 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 189 in the fall is likely to achieve *Level 3* performance on the SBAC ELA summative test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 199 in the spring is also likely to achieve *Level 3* performance on the 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

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	100–159	1–20	160–174	21–56	**175**–188	57–85	189–350	86–99
3	100–175	1–25	176–188	26–55	**189**–199	56–78	200–350	79–99
4	100–187	1–29	188–197	30–52	**198**–207	53–74	208–350	75–99
5	100–192	1–23	193–203	24–48	**204**–216	49–77	217–350	78–99
6	100–196	1–20	197–210	21–51	**211**–225	52–82	226–350	83–99
7	100–199	1–18	200–213	19–49	**214**–228	50–80	229–350	81–99
8	100–203	1–20	204–217	21–49	**218**–234	50–83	235–350	84–99
Winter								
2	100–169	1–22	170–183	23–56	**184**–195	57–83	196–350	84–99
3	100–183	1–26	184–195	27–54	**196**–205	55–76	206–350	77–99
4	100–193	1–29	194–203	30–53	**204**–212	54–73	213–350	74–99
5	100–198	1–25	199–208	26–49	**209**–220	50–76	221–350	77–99
6	100–201	1–22	202–213	23–49	**214**–227	50–80	228–350	81–99
7	100–203	1–20	204–216	21–49	**217**–230	50–79	231–350	80–99
8	100–206	1–20	207–220	21–50	**221**–235	51–81	236–350	82–99
Spring								
2	100–174	1–24	175–187	25–55	**188**–199	56–81	200–350	82–99
3	100–187	1–28	188–198	29–54	**199**–208	55–76	209–350	77–99
4	100–196	1–31	197–205	32–52	**206**–214	53–72	215–350	73–99
5	100–200	1–26	201–210	27–49	**211**–221	50–74	222–350	75–99
6	100–203	1–23	204–215	24–51	**216**–228	52–79	229–350	80–99
7	100–205	1–22	206–217	23–48	**218**–231	49–79	232–350	80–99
8	100–208	1–22	209–221	23–50	**222**–236	51–81	237–350	82–99

*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

SBAC Mathematics				
Grade	***Level 1***	***Level 2***	***Level 3***	***Level 4***
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	100–164	1–21	165–174	22–49	**175**–187	50–83	188–350	84–99
3	100–178	1–23	179–187	24–48	**188**–199	49–79	200–350	80–99
4	100–187	1–20	188–201	21–56	**202**–212	57–81	213–350	82–99
5	100–199	1–26	200–213	27–62	**214**–222	63–81	223–350	82–99
6	100–205	1–28	206–218	29–59	**219**–228	60–80	229–350	81–99
7	100–210	1–29	211–224	30–60	**225**–235	61–81	236–350	82–99
8	100–217	1–35	218–231	36–64	**232**–243	65–83	244–350	84–99
Winter								
2	100–173	1–21	174–183	22–49	**184**–195	50–81	196–350	82–99
3	100–186	1–24	187–195	25–48	**196**–206	49–78	207–350	79–99
4	100–193	1–20	194–208	21–57	**209**–219	58–82	220–350	83–99
5	100–205	1–28	206–219	29–62	**220**–228	63–81	229–350	82–99
6	100–210	1–29	211–223	30–59	**224**–233	60–80	234–350	81–99
7	100–213	1–28	214–228	29–60	**229**–239	61–80	240–350	81–99
8	100–220	1–35	221–234	36–63	**235**–246	64–83	247–350	84–99
Spring								
2	100–179	1–23	180–188	24–48	**189**–200	49–80	201–350	81–99
3	100–191	1–25	192–200	26–49	**201**–211	50–77	212–350	78–99
4	100–198	1–22	199–212	23–55	**213**–223	56–80	224–350	81–99
5	100–209	1–29	210–223	30–61	**224**–232	62–79	233–350	80–99
6	100–213	1–30	214–226	31–58	**227**–236	59–78	237–350	79–99
7	100–216	1–29	217–231	30–60	**232**–242	61–80	243–350	81–99
8	100–222	1–35	223–236	36–62	**237**–248	63–82	249–350	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.

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 SBAC summative tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.80 to 0.86 for ELA/reading and 0.81 to 0.91 for mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the SBAC summative assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on SBAC in Grade 3.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the SBAC summative tests, there is a notable limitation to how these results should be used and interpreted. The 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 summative tests and vice versa.

Table 3.7. Classification Accuracy Results

Grade	N	Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	Precision	AUC*
		MAP Growth	SBAC		FP	FN				
ELA/Reading										
2	13,135	188	2432	0.80	0.20	0.20	0.80	0.80	0.76	0.89
3	17,349	199	2432	0.86	0.16	0.12	0.88	0.84	0.84	0.94
4	17,013	206	2473	0.85	0.17	0.13	0.87	0.83	0.84	0.93
5	17,538	211	2502	0.85	0.17	0.13	0.87	0.83	0.86	0.93
6	16,029	216	2531	0.84	0.17	0.15	0.85	0.83	0.84	0.93
7	15,414	218	2552	0.84	0.16	0.15	0.85	0.84	0.86	0.93
8	13,865	222	2567	0.85	0.16	0.15	0.85	0.84	0.85	0.93
Mathematics										
2	12,317	189	2436	0.81	0.23	0.15	0.85	0.77	0.77	0.90
3	18,496	201	2436	0.87	0.17	0.10	0.90	0.83	0.85	0.95
4	18,616	213	2485	0.87	0.12	0.14	0.86	0.88	0.86	0.95
5	19,276	224	2528	0.89	0.09	0.14	0.86	0.91	0.87	0.96
6	17,857	227	2552	0.89	0.09	0.12	0.88	0.91	0.86	0.96
7	17,371	232	2567	0.90	0.07	0.13	0.87	0.93	0.89	0.97
8	14,981	237	2586	0.91	0.08	0.12	0.88	0.92	0.87	0.97

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

3.5. Post-Hoc Analyses

A post-hoc analysis was conducted to evaluate the sensitivity of the results to different poststratification weighting methods, given that we did not have data for three of the 12 SBAC states (i.e., Montana, Vermont, and Michigan).[4] Results were compared across three scenarios. One scenario involved student demographics and state student participation. A second used no poststratification weighting and relied on sample data only, and a third scenario used poststratification weights for student demographics but not state student participation. More specifically, cut scores and classification accuracy statistics derived from the following scenarios were compared: (1) the sample weighted to population data for the nine participating states by race, sex, achievement level, and state student participation; (2) the unweighted sample; and (3) the sample weighted to population data for the 12 SBAC states from Spring 2019 by race, sex, and achievement level without considering state student participation. In the third scenario, population data were available for three states, but there were no corresponding sample data.

The comparison of cut scores among the different scenarios showed that any differences were within 1 RIT unit. Results from first scenario are reported for this linking study because student participation for each state was considered to be an important characteristic of the target population and because the sample included data from these nine states only. Although SBAC states not included in this study could use the results for predicting proficiency on the SBAC assessment, accuracy of using the results for their students is unknown because no sample data existed for them in the linking procedure or the classification analysis study. However, the small differences across the three scenarios suggest that the cut scores in this study are suitably approximate for all SBAC states. This study provides context for predicting proficiency for the entire SBAC population, but the most accurate results for an individual state will be the state-specific SBAC linking studies.

3.6. Proficiency Projection

Table 3.8 and Table 3.9 present the estimated probability of achieving *Level 3* performance on the SBAC summative test based on RIT scores from fall, winter, or spring. “Prob.” indicates the probability of obtaining proficient status on the SBAC summative test in the spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 201 in the fall has a 93% chance of reaching *Level 3* or higher on the SBAC summative test.

[4] The 12 states included California, Connecticut, Delaware, Hawaii, Idaho, Michigan, Montana, Nevada, Oregon, South Dakota, Vermont, and Washington. The data collected from Michigan could not be used in this study because the state scale scores are not on the SBAC scale. As a result, Michigan should refer to its own linking study results.

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

ELA/Reading											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Level 3	Prob.		*Level 3*	Prob.		*Level 3*	Prob.
2	5	188	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	188	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	188	157	No	0.02	166	No	<0.01	170	No	<0.01
	20	188	160	No	0.04	169	No	<0.01	173	No	<0.01
	25	188	162	No	0.06	171	No	0.01	175	No	<0.01
	30	188	164	No	0.09	173	No	0.03	177	No	<0.01
	35	188	166	No	0.15	175	No	0.07	180	No	0.01
	40	188	168	No	0.21	177	No	0.13	182	No	0.03
	45	188	170	No	0.25	179	No	0.17	184	No	0.11
	50	188	172	No	0.35	181	No	0.29	186	No	0.27
	55	188	174	No	0.45	183	No	0.43	188	Yes	0.50
	60	188	176	Yes	0.55	185	Yes	0.57	189	Yes	0.62
	65	188	178	Yes	0.65	187	Yes	0.71	192	Yes	0.89
	70	188	180	Yes	0.70	189	Yes	0.83	194	Yes	0.97
	75	188	183	Yes	0.82	191	Yes	0.90	196	Yes	0.99
	80	188	185	Yes	0.88	194	Yes	0.97	199	Yes	>0.99
	85	188	188	Yes	0.93	197	Yes	0.99	202	Yes	>0.99
	90	188	192	Yes	0.98	200	Yes	>0.99	205	Yes	>0.99
	95	188	197	Yes	0.99	206	Yes	>0.99	211	Yes	>0.99
3	5	199	159	No	<0.01	167	No	<0.01	170	No	<0.01
	10	199	165	No	<0.01	173	No	<0.01	176	No	<0.01
	15	199	169	No	0.01	177	No	<0.01	180	No	<0.01
	20	199	173	No	0.03	180	No	<0.01	183	No	<0.01
	25	199	175	No	0.05	183	No	0.01	186	No	<0.01
	30	199	178	No	0.11	185	No	0.03	189	No	<0.01
	35	199	180	No	0.14	188	No	0.09	191	No	0.01
	40	199	182	No	0.21	190	No	0.13	193	No	0.03
	45	199	185	No	0.34	192	No	0.23	195	No	0.11
	50	199	187	No	0.39	194	No	0.35	197	No	0.27
	55	199	189	Yes	0.50	196	Yes	0.50	199	Yes	0.50
	60	199	191	Yes	0.61	198	Yes	0.65	201	Yes	0.73
	65	199	193	Yes	0.70	200	Yes	0.77	203	Yes	0.89
	70	199	195	Yes	0.75	202	Yes	0.87	206	Yes	0.99
	75	199	198	Yes	0.86	205	Yes	0.95	208	Yes	>0.99
	80	199	201	Yes	0.93	207	Yes	0.98	211	Yes	>0.99
	85	199	204	Yes	0.96	211	Yes	>0.99	214	Yes	>0.99
	90	199	208	Yes	0.99	215	Yes	>0.99	218	Yes	>0.99
	95	199	214	Yes	>0.99	220	Yes	>0.99	224	Yes	>0.99

ELA/Reading												
			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.	
4	5	206	169	No	<0.01	176	No	<0.01	178	No	<0.01	
	10	206	175	No	<0.01	182	No	<0.01	184	No	<0.01	
	15	206	179	No	0.01	186	No	<0.01	188	No	<0.01	
	20	206	183	No	0.04	189	No	<0.01	191	No	<0.01	
	25	206	185	No	0.06	192	No	0.02	194	No	<0.01	
	30	206	188	No	0.11	194	No	0.04	196	No	<0.01	
	35	206	190	No	0.17	196	No	0.09	199	No	0.01	
	40	206	192	No	0.24	198	No	0.17	201	No	0.06	
	45	206	195	No	0.34	200	No	0.22	203	No	0.17	
	50	206	197	No	0.44	202	No	0.35	205	No	0.38	
	55	206	199	Yes	0.56	205	Yes	0.58	207	Yes	0.62	
	60	206	201	Yes	0.66	207	Yes	0.72	209	Yes	0.83	
	65	206	203	Yes	0.71	209	Yes	0.83	211	Yes	0.94	
	70	206	205	Yes	0.80	211	Yes	0.91	213	Yes	0.99	
	75	206	208	Yes	0.89	213	Yes	0.96	216	Yes	>0.99	
	80	206	211	Yes	0.94	216	Yes	0.99	219	Yes	>0.99	
	85	206	214	Yes	0.97	219	Yes	>0.99	222	Yes	>0.99	
	90	206	218	Yes	0.99	223	Yes	>0.99	226	Yes	>0.99	
	95	206	224	Yes	>0.99	229	Yes	>0.99	232	Yes	>0.99	
5	5	211	178	No	<0.01	183	No	<0.01	185	No	<0.01	
	10	211	183	No	<0.01	189	No	<0.01	191	No	<0.01	
	15	211	187	No	0.02	193	No	<0.01	194	No	<0.01	
	20	211	191	No	0.05	196	No	0.01	198	No	<0.01	
	25	211	193	No	0.08	198	No	0.02	200	No	<0.01	
	30	211	196	No	0.17	201	No	0.06	203	No	0.01	
	35	211	198	No	0.20	203	No	0.13	205	No	0.03	
	40	211	200	No	0.29	205	No	0.22	207	No	0.11	
	45	211	202	No	0.39	207	No	0.35	209	No	0.27	
	50	211	204	Yes	0.50	209	Yes	0.50	211	Yes	0.50	
	55	211	207	Yes	0.61	211	Yes	0.65	213	Yes	0.73	
	60	211	209	Yes	0.71	213	Yes	0.78	215	Yes	0.89	
	65	211	211	Yes	0.80	215	Yes	0.87	217	Yes	0.97	
	70	211	213	Yes	0.83	217	Yes	0.91	219	Yes	0.99	
	75	211	216	Yes	0.92	220	Yes	0.97	222	Yes	>0.99	
	80	211	218	Yes	0.95	222	Yes	0.99	224	Yes	>0.99	
	85	211	221	Yes	0.97	226	Yes	>0.99	228	Yes	>0.99	
	90	211	225	Yes	0.99	229	Yes	>0.99	231	Yes	>0.99	
	95	211	231	Yes	>0.99	235	Yes	>0.99	237	Yes	>0.99	

ELA/Reading											
			Fall			Winter			Spring		
	Start	Spring	Fall	Projected Proficiency		Winter	Projected Proficiency		Spring	Projected Proficiency	
Grade	%ile	Cut	RIT	*Level 3*	Prob.	RIT	*Level 3*	Prob.	RIT	*Level 3*	Prob.
	5	216	183	No	<0.01	188	No	<0.01	189	No	<0.01
	10	216	189	No	<0.01	193	No	<0.01	195	No	<0.01
	15	216	193	No	0.01	197	No	<0.01	199	No	<0.01
	20	216	196	No	0.03	200	No	<0.01	202	No	<0.01
	25	216	199	No	0.08	203	No	0.02	205	No	<0.01
	30	216	202	No	0.13	205	No	0.04	207	No	<0.01
	35	216	204	No	0.19	208	No	0.12	209	No	0.01
	40	216	206	No	0.28	210	No	0.22	211	No	0.06
	45	216	208	No	0.33	212	No	0.35	213	No	0.17
6	50	216	210	No	0.44	214	Yes	0.50	215	No	0.38
	55	216	212	Yes	0.56	216	Yes	0.58	217	Yes	0.62
	60	216	214	Yes	0.67	218	Yes	0.72	219	Yes	0.83
	65	216	217	Yes	0.76	220	Yes	0.83	222	Yes	0.97
	70	216	219	Yes	0.84	222	Yes	0.91	224	Yes	0.99
	75	216	221	Yes	0.90	225	Yes	0.97	226	Yes	>0.99
	80	216	224	Yes	0.94	227	Yes	0.99	229	Yes	>0.99
	85	216	227	Yes	0.98	230	Yes	>0.99	232	Yes	>0.99
	90	216	231	Yes	>0.99	234	Yes	>0.99	236	Yes	>0.99
	95	216	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99
	5	218	187	No	<0.01	190	No	<0.01	191	No	<0.01
	10	218	193	No	<0.01	196	No	<0.01	197	No	<0.01
	15	218	197	No	0.02	200	No	<0.01	201	No	<0.01
	20	218	200	No	0.04	203	No	0.01	205	No	<0.01
	25	218	203	No	0.08	206	No	0.03	207	No	<0.01
	30	218	206	No	0.16	209	No	0.09	210	No	0.01
	35	218	208	No	0.24	211	No	0.17	212	No	0.03
	40	218	210	No	0.33	213	No	0.22	214	No	0.11
	45	218	212	No	0.39	215	No	0.35	216	No	0.27
7	50	218	214	Yes	0.50	217	Yes	0.50	218	Yes	0.50
	55	218	216	Yes	0.61	219	Yes	0.65	220	Yes	0.73
	60	218	218	Yes	0.72	221	Yes	0.78	223	Yes	0.94
	65	218	221	Yes	0.81	223	Yes	0.88	225	Yes	0.99
	70	218	223	Yes	0.88	226	Yes	0.96	227	Yes	>0.99
	75	218	225	Yes	0.92	228	Yes	0.98	229	Yes	>0.99
	80	218	228	Yes	0.97	231	Yes	>0.99	232	Yes	>0.99
	85	218	231	Yes	0.98	234	Yes	>0.99	235	Yes	>0.99
	90	218	235	Yes	>0.99	238	Yes	>0.99	239	Yes	>0.99
	95	218	241	Yes	>0.99	244	Yes	>0.99	245	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.
8	5	222	190	No	<0.01	193	No	<0.01	194	No	<0.01
	10	222	196	No	<0.01	199	No	<0.01	200	No	<0.01
	15	222	200	No	0.01	203	No	<0.01	204	No	<0.01
	20	222	204	No	0.04	206	No	<0.01	207	No	<0.01
	25	222	207	No	0.08	209	No	0.02	210	No	<0.01
	30	222	209	No	0.13	212	No	0.04	213	No	<0.01
	35	222	211	No	0.17	214	No	0.09	215	No	0.01
	40	222	214	No	0.29	216	No	0.17	217	No	0.06
	45	222	216	No	0.39	218	No	0.28	220	No	0.27
	50	222	218	Yes	0.50	221	Yes	0.50	222	Yes	0.50
	55	222	220	Yes	0.55	223	Yes	0.65	224	Yes	0.73
	60	222	222	Yes	0.66	225	Yes	0.78	226	Yes	0.89
	65	222	225	Yes	0.80	227	Yes	0.87	228	Yes	0.97
	70	222	227	Yes	0.87	229	Yes	0.94	231	Yes	>0.99
	75	222	230	Yes	0.92	232	Yes	0.98	233	Yes	>0.99
	80	222	232	Yes	0.95	235	Yes	>0.99	236	Yes	>0.99
	85	222	236	Yes	0.99	238	Yes	>0.99	239	Yes	>0.99
	90	222	240	Yes	>0.99	242	Yes	>0.99	243	Yes	>0.99
	95	222	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99

Table 3.9. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
			Fall			Winter			Spring		
				Projected Proficiency			Projected Proficiency			Projected Proficiency	
Grade	Start %ile	Spring Cut	Fall RIT	*Level 3*	Prob.	Winter RIT	*Level 3*	Prob.	Spring RIT	*Level 3*	Prob.
2	5	189	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	189	158	No	0.01	167	No	<0.01	172	No	<0.01
	15	189	162	No	0.04	171	No	0.01	175	No	<0.01
	20	189	164	No	0.06	173	No	0.02	178	No	<0.01
	25	189	166	No	0.11	175	No	0.05	180	No	<0.01
	30	189	168	No	0.18	177	No	0.10	182	No	0.01
	35	189	170	No	0.27	179	No	0.20	184	No	0.04
	40	189	172	No	0.38	181	No	0.26	186	No	0.15
	45	189	173	No	0.44	182	No	0.34	188	No	0.37
	50	189	175	Yes	0.50	184	Yes	0.50	189	Yes	0.50
	55	189	177	Yes	0.62	186	Yes	0.66	191	Yes	0.75
	60	189	178	Yes	0.68	187	Yes	0.74	193	Yes	0.92
	65	189	180	Yes	0.78	189	Yes	0.85	195	Yes	0.98
	70	189	182	Yes	0.86	191	Yes	0.93	196	Yes	0.99
	75	189	184	Yes	0.92	193	Yes	0.97	198	Yes	>0.99
	80	189	186	Yes	0.94	195	Yes	0.99	201	Yes	>0.99
	85	189	188	Yes	0.97	198	Yes	>0.99	203	Yes	>0.99
	90	189	192	Yes	0.99	201	Yes	>0.99	207	Yes	>0.99
	95	189	196	Yes	>0.99	205	Yes	>0.99	212	Yes	>0.99
3	5	201	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	201	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	201	175	No	0.02	182	No	<0.01	186	No	<0.01
	20	201	177	No	0.04	185	No	0.01	189	No	<0.01
	25	201	179	No	0.07	187	No	0.03	192	No	<0.01
	30	201	181	No	0.13	189	No	0.07	194	No	0.01
	35	201	183	No	0.21	191	No	0.14	196	No	0.04
	40	201	185	No	0.31	193	No	0.26	198	No	0.15
	45	201	187	No	0.44	195	No	0.42	199	No	0.25
	50	201	188	Yes	0.50	196	Yes	0.50	201	Yes	0.50
	55	201	190	Yes	0.63	198	Yes	0.67	203	Yes	0.75
	60	201	192	Yes	0.69	200	Yes	0.80	205	Yes	0.92
	65	201	194	Yes	0.79	201	Yes	0.86	207	Yes	0.98
	70	201	196	Yes	0.87	203	Yes	0.93	208	Yes	0.99
	75	201	198	Yes	0.93	205	Yes	0.97	211	Yes	>0.99
	80	201	200	Yes	0.96	208	Yes	0.99	213	Yes	>0.99
	85	201	202	Yes	0.98	210	Yes	>0.99	216	Yes	>0.99
	90	201	206	Yes	>0.99	214	Yes	>0.99	219	Yes	>0.99
	95	201	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99

Mathematics												
			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.	
4	5	213	176	No	<0.01	182	No	<0.01	185	No	<0.01	
	10	213	181	No	<0.01	187	No	<0.01	191	No	<0.01	
	15	213	185	No	<0.01	191	No	<0.01	194	No	<0.01	
	20	213	187	No	0.01	194	No	<0.01	197	No	<0.01	
	25	213	190	No	0.03	196	No	<0.01	200	No	<0.01	
	30	213	192	No	0.05	198	No	0.01	202	No	<0.01	
	35	213	194	No	0.10	200	No	0.03	205	No	<0.01	
	40	213	196	No	0.17	202	No	0.07	207	No	0.02	
	45	213	198	No	0.26	204	No	0.14	209	No	0.08	
	50	213	200	No	0.37	206	No	0.26	211	No	0.25	
	55	213	201	No	0.44	208	No	0.42	212	No	0.37	
	60	213	203	Yes	0.56	210	Yes	0.58	214	Yes	0.63	
	65	213	205	Yes	0.68	212	Yes	0.74	217	Yes	0.92	
	70	213	207	Yes	0.79	214	Yes	0.86	219	Yes	0.98	
	75	213	209	Yes	0.87	216	Yes	0.93	221	Yes	>0.99	
	80	213	212	Yes	0.95	219	Yes	0.98	224	Yes	>0.99	
	85	213	214	Yes	0.97	221	Yes	0.99	227	Yes	>0.99	
	90	213	218	Yes	0.99	225	Yes	>0.99	230	Yes	>0.99	
	95	213	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	
5	5	224	184	No	<0.01	189	No	<0.01	191	No	<0.01	
	10	224	190	No	<0.01	194	No	<0.01	197	No	<0.01	
	15	224	193	No	<0.01	198	No	<0.01	201	No	<0.01	
	20	224	196	No	<0.01	201	No	<0.01	205	No	<0.01	
	25	224	199	No	0.01	204	No	<0.01	207	No	<0.01	
	30	224	201	No	0.02	206	No	<0.01	210	No	<0.01	
	35	224	203	No	0.05	209	No	0.01	212	No	<0.01	
	40	224	205	No	0.08	211	No	0.03	215	No	<0.01	
	45	224	207	No	0.14	213	No	0.07	217	No	0.01	
	50	224	209	No	0.22	215	No	0.15	219	No	0.04	
	55	224	211	No	0.32	217	No	0.26	221	No	0.15	
	60	224	213	No	0.44	219	No	0.42	223	No	0.37	
	65	224	215	Yes	0.56	221	Yes	0.58	225	Yes	0.63	
	70	224	217	Yes	0.68	223	Yes	0.74	228	Yes	0.92	
	75	224	219	Yes	0.78	225	Yes	0.85	230	Yes	0.98	
	80	224	222	Yes	0.89	228	Yes	0.95	233	Yes	>0.99	
	85	224	225	Yes	0.95	231	Yes	0.99	236	Yes	>0.99	
	90	224	229	Yes	0.99	235	Yes	>0.99	240	Yes	>0.99	
	95	224	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99	

Mathematics												
			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.	
6	5	227	188	No	<0.01	192	No	<0.01	194	No	<0.01	
	10	227	194	No	<0.01	198	No	<0.01	200	No	<0.01	
	15	227	198	No	<0.01	202	No	<0.01	205	No	<0.01	
	20	227	201	No	<0.01	205	No	<0.01	208	No	<0.01	
	25	227	204	No	0.01	208	No	<0.01	211	No	<0.01	
	30	227	206	No	0.02	211	No	<0.01	214	No	<0.01	
	35	227	209	No	0.06	213	No	0.01	216	No	<0.01	
	40	227	211	No	0.10	215	No	0.03	218	No	<0.01	
	45	227	213	No	0.17	217	No	0.07	221	No	0.02	
	50	227	215	No	0.27	220	No	0.20	223	No	0.08	
	55	227	217	No	0.38	222	No	0.34	225	No	0.25	
	60	227	219	Yes	0.50	224	Yes	0.50	227	Yes	0.50	
	65	227	221	Yes	0.62	226	Yes	0.66	230	Yes	0.85	
	70	227	223	Yes	0.73	228	Yes	0.80	232	Yes	0.96	
	75	227	226	Yes	0.86	231	Yes	0.93	235	Yes	>0.99	
	80	227	228	Yes	0.92	234	Yes	0.98	238	Yes	>0.99	
	85	227	231	Yes	0.97	237	Yes	>0.99	241	Yes	>0.99	
	90	227	235	Yes	0.99	241	Yes	>0.99	245	Yes	>0.99	
	95	227	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	
7	5	232	192	No	<0.01	194	No	<0.01	196	No	<0.01	
	10	232	198	No	<0.01	201	No	<0.01	203	No	<0.01	
	15	232	202	No	<0.01	205	No	<0.01	207	No	<0.01	
	20	232	206	No	<0.01	209	No	<0.01	211	No	<0.01	
	25	232	208	No	<0.01	212	No	<0.01	214	No	<0.01	
	30	232	211	No	0.01	215	No	<0.01	217	No	<0.01	
	35	232	213	No	0.02	217	No	<0.01	220	No	<0.01	
	40	232	216	No	0.05	219	No	0.02	222	No	<0.01	
	45	232	218	No	0.13	222	No	0.07	224	No	<0.01	
	50	232	220	No	0.21	224	No	0.14	227	No	0.04	
	55	232	222	No	0.31	226	No	0.26	229	No	0.15	
	60	232	225	Yes	0.50	229	Yes	0.50	231	No	0.37	
	65	232	227	Yes	0.63	231	Yes	0.67	234	Yes	0.75	
	70	232	229	Yes	0.74	233	Yes	0.80	236	Yes	0.92	
	75	232	232	Yes	0.87	236	Yes	0.93	239	Yes	0.99	
	80	232	235	Yes	0.95	239	Yes	0.98	242	Yes	>0.99	
	85	232	238	Yes	0.98	243	Yes	>0.99	246	Yes	>0.99	
	90	232	243	Yes	>0.99	247	Yes	>0.99	251	Yes	>0.99	
	95	232	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Level 3	Prob.		*Level 3*	Prob.		*Level 3*	Prob.	
8	5	237	194	No	<0.01	196	No	<0.01	197	No	<0.01	
	10	237	201	No	<0.01	203	No	<0.01	205	No	<0.01	
	15	237	205	No	<0.01	208	No	<0.01	210	No	<0.01	
	20	237	209	No	<0.01	212	No	<0.01	214	No	<0.01	
	25	237	212	No	<0.01	215	No	<0.01	217	No	<0.01	
	30	237	215	No	0.01	218	No	<0.01	220	No	<0.01	
	35	237	218	No	0.02	221	No	<0.01	223	No	<0.01	
	40	237	220	No	0.04	223	No	0.01	225	No	<0.01	
	45	237	223	No	0.10	226	No	0.03	228	No	<0.01	
	50	237	225	No	0.16	228	No	0.07	230	No	0.01	
	55	237	227	No	0.24	231	No	0.20	233	No	0.08	
	60	237	230	No	0.39	233	No	0.34	235	No	0.25	
	65	237	232	Yes	0.50	236	Yes	0.58	238	Yes	0.63	
	70	237	235	Yes	0.67	238	Yes	0.73	241	Yes	0.92	
	75	237	238	Yes	0.81	241	Yes	0.89	244	Yes	0.99	
	80	237	241	Yes	0.90	244	Yes	0.97	247	Yes	>0.99	
	85	237	245	Yes	0.97	248	Yes	>0.99	251	Yes	>0.99	
	90	237	249	Yes	0.99	253	Yes	>0.99	256	Yes	>0.99	
	95	237	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99	

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