Predicting Proficiency on AK STAR Summative based on NWEA MAP Growth Scores

September 2022

NWEA Psychometric Solutions

Linking Study Updates

Date	Description
2016-02	Initial linking study conducted for the Alaska Measures of Progress (AMP) assessments in Grades 3–10 for ELA and mathematics using Spring 2015 data
2018-06-26	Updated the linking study for the Performance Evaluation for Alaska's Schools (PEAKS) assessment in Grades 3–8 for ELA and mathematics using Spring 2017 data
2020-07-02	Incorporated the 2020 MAP Growth norms using Spring 2017 data
2022-09-15	Updated the linking study for the new Alaska System of Academic Readiness (AK STAR) spring summative assessment in Grades 3–9 for ELA and mathematics using Spring 2022 data

Acknowledgements: This report benefited from the project management of Debbie Bauman, the data analysis of Sarah-Truclinh Tran, the editorial assistance of Kelly Rivard, and the psychometric leadership of Ann Hu. We appreciate our colleagues at NWEA who assisted in partner recruitment and are grateful to all our partners who provided data for the study.

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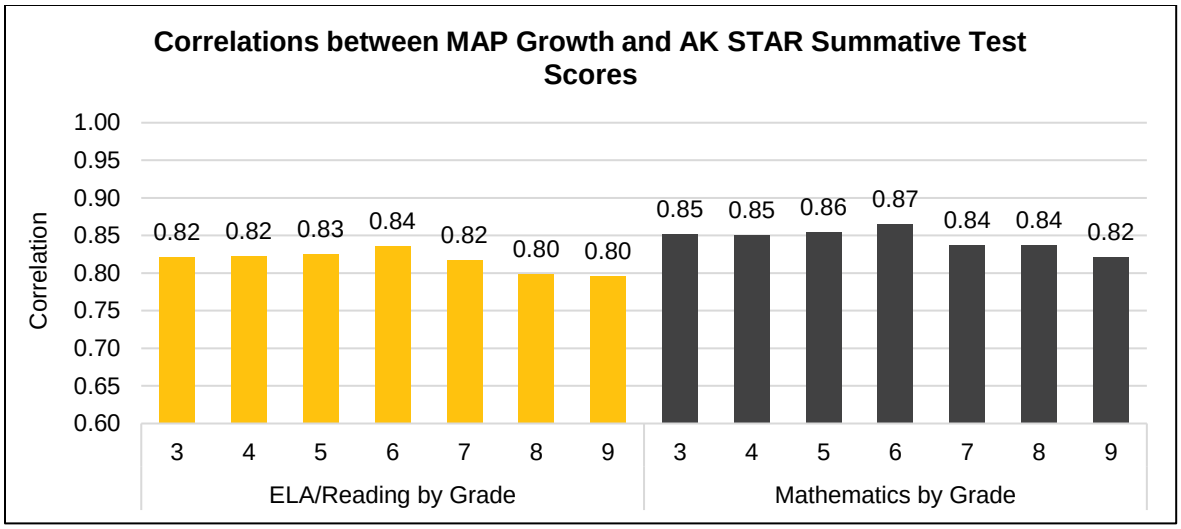
Executive Summary

Linking studies allow partners to use MAP® Growth™ Rasch Unit (RIT) scores throughout the year to predict their students' performance levels on the state summative assessment. This is accomplished through statistical analyses that produce RIT cut scores that correspond to the state summative achievement levels. A *cut score* is the minimum score a student must get on a test to be placed in a certain achievement level. The linking study for the Alaska System of Academic Readiness (AK STAR) described in this report provides RIT cut scores for the fall, winter, and spring MAP Growth administrations that correspond to the AK STAR achievement levels for each subject and grade. Educators can use this information to identify students at risk of not meeting state proficiency standards and provide targeted instruction to improve academic outcomes.

AK STAR is a connected interim and summative assessment system that administers MAP Growth in the fall and winter and an end-of-year summative test in the spring for English language arts (ELA) and mathematics in Grades 3–9. In Year 1 (2021–2022), students took MAP Growth Reading and Mathematics in the fall, winter, and spring, along with the Alaska end-of-year summative assessment in the spring to link the two test scales. In Year 2 (2022–2023) and beyond, students can take the MAP Growth standalone assessment in the fall and winter and the end-of-year summative test in the spring that includes embedded MAP Growth items and produces a linked instructional area RIT score. The MAP Growth reports include a RIT score along with a projected proficiency score based on the results of this linking study to help inform instruction throughout the year.

The linking study is based on test scores from students in Grades 3–9 who took both the MAP Growth and AK STAR spring summative assessments in ELA/reading and mathematics in Spring 2022. The linking study sample included 41,175 students across 50 districts and 444 schools in Alaska. The test scores from both tests were used as the basis for linking the two assessments together.

Before the linking analyses began, NWEA confirmed that the MAP Growth interim and AK STAR summative assessments were constructed based on the same or similar set of content standards to warrant a connection. The link between the two tests was further investigated by calculating correlation coefficients that indicate the relationship between the MAP Growth and AK STAR summative test scores. A high, positive correlation (e.g., ≥ 0.70) shows that students who perform well on one assessment also tend to perform well on the other, and vice versa, with 1.00 being a perfect positive correlation. The correlations between the MAP Growth and AK STAR summative test scores from Spring 2022, shown below, are consistent with our linking study expectations, indicating that MAP Growth is a good assessment for predicting performance on the AK STAR spring summative assessment.



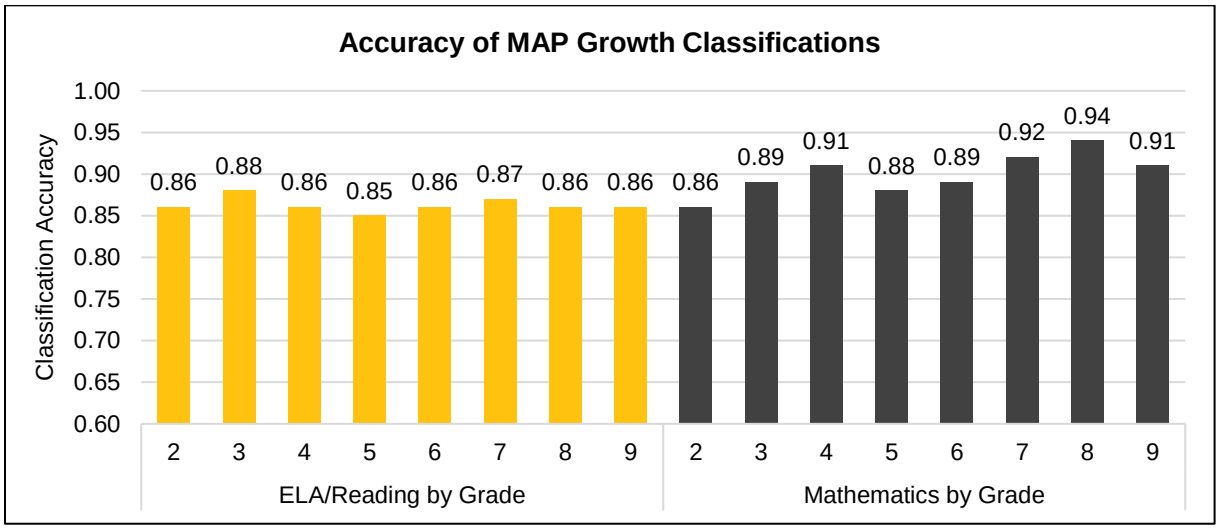
The equipercentile linking method and the 2020 MAP Growth norms (Thum & Kuhfeld, 2020) were then used to produce the RIT cut scores that correlate to performance on the AK STAR summative assessment for every subject and grade. While RIT cut scores were generated for every achievement level on the AK STAR summative assessment, Table E.1 presents the *Proficient* cut scores that indicate the minimum score a student must get to be considered proficient.

Table E.1. MAP Growth RIT Cut Scores for AK STAR Proficiency

Assessment		***Proficient* Cut Scores by Grade**							
		2	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ELA/Reading									
AK STAR Spring		–	1589	1594	1596	1605	1618	1622	1629
MAP Growth Reading	Fall	184	197	204	206	212	222	226	228
	Winter	192	203	209	210	216	224	228	229
	Spring	196	206	211	212	217	225	229	230
Mathematics									
AK STAR Spring		–	1528	1542	1544	1566	1585	1610	1605
MAP Growth Mathematics	Fall	181	194	205	210	219	230	242	245
	Winter	190	201	212	216	224	234	245	247
	Spring	195	206	216	220	227	237	247	248

Educators can use these cut scores to determine whether students are on track for proficiency on the state assessment. For example, the *Proficient* cut score on the Grade 3 AK STAR ELA summative test is 1589. A Grade 3 student with a MAP Growth Reading RIT score of 197 in the fall is likely to meet proficiency on the AK STAR ELA summative test in the spring, whereas a Grade 3 student with a RIT score lower than 197 in the fall is in jeopardy of not meeting proficiency. MAP Growth cut scores for Grade 2 are also provided so educators can track early learners' progress toward proficiency on the AK STAR spring summative assessment by Grade 2.

As further evidence that MAP Growth scores can be used to predict students' proficiency on the state test, NWEA calculated classification accuracy statistics that show how well the RIT scores correctly classified, or predicted, students as proficient on the AK STAR summative tests. For example, the Grade 3 MAP Growth Reading *Proficient* cut score has a 0.88 accuracy rate, meaning it accurately predicted student achievement on the state test for 88% of the sample. A high statistic indicates high accuracy. Overall, MAP Growth scores have a high accuracy rate of identifying student proficiency on the AK STAR summative tests, as illustrated below.



Please note that the purpose of this report is to explain NWEA's linking study methodology. It is not meant as the main reference for determining a student's likely performance on the state summative assessment. The cut scores 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), whereas instructional weeks often vary by district. The cut scores in this report may therefore differ from the results in the NWEA reporting system that reflect the specific instructional weeks set by partners. Partners should therefore reference their MAP Growth score reports instead.

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 to statistically connect Rasch Unit (RIT) scores from the MAP Growth assessments with scores from the Alaska System of Academic Readiness (AK STAR) spring summative assessments in Grades 3–9 in English language arts (ELA) and mathematics taken during the Spring 2022 term.[1] MAP Growth cut scores are also included for Grade 2 so educators can track early learners' progress toward proficiency on the AK STAR summative test by Grade 3. Specifically, this report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth cut scores from fall, winter, and spring that correspond to the achievement levels on the AK STAR spring summative assessment
4. Classification accuracy statistics to determine the degree to which MAP Growth accurately predicts student proficiency status on the AK STAR summative tests
5. The probability of achieving grade-level proficiency on the AK STAR summative assessment based on MAP Growth RIT scores from fall, winter, and spring

The linking study has been updated since the previous version published in July 2020 to provide MAP Growth cut scores corresponding to the new AK STAR summative assessment administered for the first time in Spring 2022.

1.2. Assessment Overview

AK STAR is Alaska's connected interim and summative assessment system for ELA and mathematics in Grades 3–9 aligned to the Alaska ELA and Mathematic Standards adopted in 2012. It was administered for the first time in 2021–2022. This solution administers MAP Growth in the fall and winter and an end-of-year summative assessment in the spring, offering coherence across the interim and summative assessments and reducing the number of yearly test events. Based on their spring summative test scores, students are placed into one of four achievement levels: *Needs Support*, *Approaching Proficient*, *Proficient*, and *Advanced*. The *Proficient* cut score demarks the minimum level of achievement considered to be proficient for accountability purposes.

[1] This study provides MAP Growth cut scores that predict proficiency on the AK STAR for Grades 2–9 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 in reading and mathematics are available in a separate report (He & Meyer, 2021).

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 to 350. To aid the interpretation of scores, NWEA conducts norming studies of student and school performance on MAP Growth. Growth norms provide expected score gains across test administrations (e.g., the relative evaluation of a student's growth from fall to spring), which are used to conduct the linking studies. 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 2022 administrations of the MAP Growth and AK STAR summative assessments. Each student's state testing record was matched to their MAP Growth score based on 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 AK STAR summative assessments in Spring 2022 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's test-taking student population in terms of race, sex, and achievement level. These variables were selected because they are known to be correlated with students' academic achievement and are often available in state summative assessment reports. The weighted sample will match the target population as closely as possible on the key demographics and performance characteristics as defined by the state.

A raking procedure was used to calculate the post-stratification weights that either compensate for the underrepresentation of certain groups or attenuate the overrepresentation of certain groups. 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 achievement level for the sample and population.
2. Calculate post-stratification weights with the rake function from the survey package in R (Lumley, 2019).
3. Trim the weights that are outside the range of 0.3 to 3.0.
4. Apply the weights to the sample before conducting the linking study analyses.

2.3. Descriptive Statistics

Descriptive statistics are provided to summarize the test scores for both the MAP Growth and AK STAR summative assessments, including the test score mean, standard deviation (SD), minimum, and maximum. The mean presents the average test scores across all students in the study sample, and the SD indicates the variability of test scores, revealing how students' scores are distributed around the average score, or mean. Correlation coefficients between the MAP Growth RIT scores and AK STAR summative scores are also provided to answer the question, "How well do the test scores from MAP Growth that reference the RIT scale correlate to the scores obtained from the AK STAR summative test that references some other scale in the same subject?" The correlations were calculated as follows:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} \quad (1)$$

where r is the correlation coefficient, x_i and y_i are the values of the x- and y-variables in a sample, and $\bar{x}$ and $\bar{y}$ are the mean of the values of the x- and y-variables.

2.4. MAP Growth Cut Scores

MAP Growth cut scores that predict student achievement on the AK STAR summative assessment are reported for Grades 3–9, as well as for Grade 2 so educators can track early learners' progress toward proficiency on the AK STAR summative test by Grade 3. Percentile ranks based on the 2020 NWEA norms are also provided. These are useful for understanding how students' scores compare to peers nationwide and the relative rigor of a state's achievement level designations for its summative assessment.

The equipercentile linking method (Kolen & Brennan, 2004) was used to identify the spring MAP Growth RIT scores for Grades 3–9 that correspond to the AK STAR spring summative achievement level cut scores. The equipercentile linking procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of tests at or below each score). For example, let x represent a score on Test X (e.g., AK STAR summative). 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 2:

$$e_y(x) = G^{-1}[P(x)] \quad (2)$$

where $e_y(x)$ is the equipercentile equivalent of score x on the AK STAR summative test on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on the AK STAR summative test, 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 to spring within the same grade or from spring of a lower grade to spring of the adjacent higher grade. This information was used to calculate the fall and winter cut scores for Grades 3–9. Equation 3 was used to determine the previous term's MAP Growth score needed to reach the spring cut score, considering the expected growth associated with the previous RIT score:

$$RIT_{PredSpring} = RIT_{previous} + g \quad (3)$$

where:

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

The MAP Growth conditional growth norms were also used to calculate the fall, winter, and spring cuts for Grade 2. Students do not begin taking the AK STAR summative assessment until Grade 3. Thus, cut scores for Grade 2 were interpolated by obtaining longitudinal data for the Grade 3 cohort. For each Grade 3 student in the study sample, their MAP Growth data from the prior year when they were in Grade 2 during 2020–2021 were obtained. In this way, the data came from the same cohort of students beginning when they were in Grade 2 and continuing through Grade 3. 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 of Grade 2 to spring of Grade 3). The calculation of fall and winter cuts for Grade 2 followed the same process as above for Grades 3–9. For example, the growth score from fall to spring in Grade 2 was used to calculate the fall cuts for Grade 2.

2.5. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the AK STAR summative test can be described using classification accuracy statistics based on the MAP Growth spring RIT cut scores. The results show the proportion of students correctly classified by their RIT scores as proficient or not proficient on the AK STAR spring summative test. A summary of how well the interpolated Grade 2 cuts predict Grade 3 proficiency status is also reported in the classification accuracy statistics. Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich et al., 2004).

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.

2.6. Proficiency Projections

Given that all test scores contain measurement errors, reaching the *Proficient* RIT cut does not guarantee that the student is proficient at the state test. Instead, we can claim that a student with the RIT cut score has a 50% chance of reaching proficiency 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 Grade 2 cut scores), the MAP Growth conditional growth norms data were also used to calculate the probability of reaching proficiency on the AK STAR summative test based on a student’s RIT scores from fall and winter (see Equation 4).

$$Pr(Achieving\ Proficient\ in\ spring|\ starting\ RIT) = \Phi\left(\frac{RIT_{previous} + g - RIT_{SpringCut}}{SD}\right) \qquad (4)$$

where:

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

Equation 5 was used to estimate the probability of a student achieving *Proficient* performance on the AK STAR summative test based on their spring RIT score (RIT_{Spring}):

$$Pr(Achieving\ Proficient\ in\ spring \mid spring\ RIT) = \Phi\left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE}\right) \quad (5)$$

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 AK STAR summative assessments in Spring 2022 were included in the study sample. Data used in this study were collected from 50 districts and 444 schools in Alaska. Table 3.1 presents the demographic distributions of race, sex, and achievement level in the original unweighted study sample. Table 3.2 presents the distributions of the target population of students who took the Spring 2022 AK STAR summative tests. Since the original study sample is different from the target AK STAR 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 AK STAR student population distributions. The analyses in this study were conducted using 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	9
ELA/Reading								
	Total N	5,985	6,094	5,871	5,784	5,744	5,441	4,688
Race	African American	2.3	2.0	2.5	2.1	2.4	2.7	2.8
	Alaska Native	20.8	21.1	20.8	21.4	21.4	20.7	23.9
	American Indian	0.6	0.6	0.6	0.5	0.5	0.5	0.7
	Asian	3.9	3.5	3.8	4.1	4.2	5.6	5.5
	Caucasian	47.5	46.0	47.4	48.3	46.8	47.2	44.6
	Hispanic	7.1	7.9	8.0	7.8	7.6	7.4	7.1
	NH/PI*	2.4	2.9	2.3	2.0	2.5	2.3	2.5
	Two or More Races	15.4	16.0	14.6	13.8	14.7	13.7	12.9
Sex	Female	50.1	51.0	49.0	50.2	48.3	47.6	46.3
	Male	49.9	49.0	51.0	49.8	51.7	52.4	53.7
Achievement Level	*Needs Support*	37.6	37.0	22.3	22.6	50.7	42.9	45.1
	Approaching Proficient	38.3	32.1	33.0	33.4	19.7	24.2	24.9
	Proficient	9.8	18.3	33.4	38.6	21.8	20.1	22.3
	Advanced	14.4	12.6	11.3	5.5	7.8	12.9	7.6
Mathematics								
	Total N	6,020	6,039	5,844	5,780	5,684	5,081	3,568
Race	African American	2.3	2.0	2.5	2.2	2.5	2.9	3.0
	Alaska Native	20.6	21.1	20.7	21.2	21.7	22.0	29.0
	American Indian	0.7	0.6	0.6	0.5	0.6	0.5	0.5
	Asian	3.9	3.5	3.7	4.1	4.1	5.8	6.2
	Caucasian	47.7	45.9	47.5	48.3	46.3	45.4	38.2
	Hispanic	7.1	7.9	8.0	7.9	7.7	7.4	7.1
	NH/PI*	2.4	2.9	2.3	2.0	2.5	2.4	2.9
	Two or More Races	15.4	16.1	14.6	13.8	14.7	13.6	13.1
Sex	Female	49.9	51.1	49.2	50.1	48.7	48.2	46.3
	Male	50.1	48.9	50.8	49.9	51.3	51.8	53.7

Linking Study Sample (Unweighted)								
Demographic Subgroup		%Students by Grade						
		3	4	5	6	7	8	9
Achievement Level	*Needs Support*	48.2	49.1	43.2	43.9	51.2	74.9	62.9
	Approaching Proficient	22.4	23.1	16.1	25.1	28.0	12.8	17.4
	Proficient	20.4	12.8	30.3	20.5	17.4	8.0	14.0
	Advanced	9.0	15.0	10.5	10.4	3.4	4.2	5.8

*NH/PI = Native Hawaiian or Other Pacific Islander.

Table 3.2. Spring 2022 AK STAR Student Population Demographics

Spring 2022 AK STAR Student Population								
Demographic Subgroup		%Students by Grade						
		3	4	5	6	7	8	9
ELA/Reading								
	Total N	6,825	6,869	6,793	6,805	6,892	6,667	6,352
Race	African American	2.2	1.9	2.2	2.1	2.3	2.7	2.6
	Alaska Native	21.9	22.0	22.0	22.2	22.2	21.9	24.1
	American Indian	0.7	0.6	0.6	0.6	0.6	0.6	0.8
	Asian	3.9	3.9	4.1	4.7	4.7	5.6	5.8
	Caucasian	47.5	46.1	47.4	47.8	46.4	46.7	44.4
	Hispanic	6.5	7.5	7.4	7.5	7.2	7.1	6.9
	NH/PI*	2.4	2.7	2.1	2.1	2.4	2.3	2.4
	Two or More Races	14.9	15.3	14.0	13.2	14.2	13.1	12.9
Sex	Female	49.8	51.1	49.4	50.4	48.7	48.4	46.8
	Male	50.2	48.9	50.6	49.6	51.3	51.6	53.2
Achievement Level	*Needs Support*	38.1	37.5	23.0	23.3	50.0	43.2	44.8
	Approaching Proficient	38.0	31.8	33.1	33.0	19.8	24.1	24.5
	Proficient	9.8	17.9	32.9	38.3	22.3	19.9	22.8
	Advanced	14.1	12.8	11.0	5.3	7.8	12.9	7.9
Mathematics								
	Total N	6,818	6,839	6,748	6,774	6,881	6,655	6,262
Race	African American	2.2	1.9	2.3	2.1	2.3	2.7	2.7
	Alaska Native	21.9	22.0	21.7	22.0	22.2	21.6	23.9
	American Indian	0.7	0.6	0.6	0.5	0.6	0.6	0.7
	Asian	4.1	3.9	4.1	4.7	4.7	5.6	5.8
	Caucasian	47.5	46.0	47.5	48.0	46.3	46.8	44.4
	Hispanic	6.6	7.5	7.4	7.4	7.2	7.1	7.1
	NH/PI*	2.3	2.7	2.2	2.1	2.5	2.4	2.5
	Two or More Races	14.7	15.3	14.1	13.2	14.2	13.1	12.9
Sex	Female	49.7	51.2	49.4	50.4	48.7	48.3	47.0
	Male	50.3	48.8	50.6	49.6	51.3	51.7	53.0
Achievement Level	*Needs Support*	49.2	49.7	44.2	45.0	50.7	72.1	61.4
	Approaching Proficient	22.2	22.9	15.7	25.0	28.0	13.9	18.2
	Proficient	20.0	12.7	29.8	20.0	17.6	9.0	14.2
	Advanced	8.6	14.7	10.3	9.9	3.7	5.0	6.2

*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	9
ELA/Reading								
	Total N	5,985	6,094	5,871	5,778	5,738	5,446	4,688
Race	African American	2.2	1.9	2.2	2.1	2.3	2.7	2.6
	Alaska Native	21.9	22.0	22.1	22.2	22.2	21.9	24.1
	American Indian	0.7	0.6	0.6	0.6	0.6	0.6	0.8
	Asian	3.9	3.9	4.1	4.7	4.7	5.6	5.8
	Caucasian	47.5	46.1	47.5	47.7	46.4	46.7	44.4
	Hispanic	6.5	7.5	7.4	7.5	7.2	7.1	6.9
	NH/PI*	2.4	2.7	2.1	2.1	2.4	2.3	2.4
	Two or More Races	14.9	15.3	14.0	13.2	14.2	13.1	12.9
Sex	Female	49.8	51.1	49.4	50.4	48.7	48.4	46.8
	Male	50.2	48.9	50.6	49.6	51.3	51.6	53.2
Achievement Level	*Needs Support*	38.1	37.5	23.0	23.3	50.1	43.2	44.8
	Approaching Proficient	38.0	31.8	33.1	33.0	19.8	24.1	24.5
	Proficient	9.8	17.9	32.9	38.3	22.3	19.9	22.8
	Advanced	14.1	12.8	11.0	5.3	7.8	12.9	7.9
Mathematics								
	Total N	6,020	6,039	5,844	5,774	5,684	5,081	3,568
Race	African American	2.2	1.9	2.3	2.1	2.3	2.7	2.7
	Alaska Native	21.9	22.0	21.7	22.0	22.2	21.6	23.9
	American Indian	0.7	0.6	0.6	0.5	0.6	0.6	0.7
	Asian	4.1	3.9	4.1	4.7	4.7	5.6	5.8
	Caucasian	47.5	46.0	47.5	48.0	46.3	46.9	44.4
	Hispanic	6.6	7.5	7.4	7.4	7.2	7.1	7.1
	NH/PI*	2.3	2.7	2.2	2.1	2.5	2.4	2.5
	Two or More Races	14.7	15.3	14.1	13.2	14.2	13.1	12.9
Sex	Female	49.7	51.2	49.4	50.4	48.7	48.3	47.0
	Male	50.3	48.8	50.6	49.6	51.3	51.7	53.0
Achievement Level	*Needs Support*	49.2	49.7	44.2	45.0	50.7	72.1	61.4
	Approaching Proficient	22.2	22.9	15.7	25.0	28.0	13.9	18.2
	Proficient	20.0	12.7	29.8	20.0	17.6	9.0	14.2
	Advanced	8.6	14.7	10.3	9.9	3.7	5.0	6.2

*NH/PI = Native Hawaiian or Other Pacific Islander.

3.2. Descriptive Statistics

Table 3.4 presents descriptive statistics of the MAP Growth and AK STAR summative test scores from Spring 2022, including the correlation coefficient (*r*) between them. The coefficients between the scores range from 0.80 to 0.84 for ELA/reading and 0.82 to 0.87 for mathematics. These values indicate a high positive correlation among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on the AK STAR spring summative assessments.

Table 3.4. Descriptive Statistics of Test Scores

Grade	N	*r*	AK STAR Summative*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
ELA/Reading										
3	5,985	0.82	1574.5	21.5	1400	1680	193.3	18.3	134	246
4	6,094	0.82	1582.2	25.7	1410	1700	201.7	17.7	141	251
5	5,871	0.83	1593.3	29.0	1420	1780	208.1	17.2	145	255
6	5,778	0.84	1600.6	33.7	1430	1800	212.7	16.8	162	261
7	5,738	0.82	1600.0	36.1	1440	1739	215.4	17.0	160	266
8	5,446	0.80	1605.4	39.6	1450	1834	219.7	16.8	159	269
9	4,688	0.80	1609.3	42.7	1450	1798	219.8	17.4	162	276
Mathematics										
3	6,020	0.85	1515.1	23.7	1400	1640	196.1	16.3	133	258
4	6,039	0.85	1527.7	25.6	1410	1722	205.6	16.8	136	288
5	5,844	0.86	1537.7	31.1	1420	1780	214.6	17.8	139	311
6	5,774	0.87	1550.1	33.7	1430	1800	218.1	17.2	157	311
7	5,684	0.84	1555.7	39.4	1440	1820	222.5	18.1	152	297
8	5,081	0.84	1565.9	42.9	1450	1840	227.2	18.5	153	292
9	3,568	0.82	1571.6	47.4	1450	1850	229.5	19.8	164	299

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

3.3. MAP Growth Cut Scores

Table 3.5 and Table 3.6 present the AK STAR summative scale score ranges and the corresponding MAP Growth RIT cut scores and percentile ranges by content area and grade. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes. These tables can be used to predict a student's likely achievement level on the AK STAR 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 197 in the fall is likely to achieve *Proficient* performance on the AK STAR summative ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 203 in the winter is also likely to achieve *Proficient* performance on the AK STAR spring summative assessment. 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 substantially from the default ones, a student's expected achievement level could be different from the projections presented in this report. 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

AK STAR Summative ELA				
Grade	***Needs Support***	***Approaching Proficient***	***Proficient***	***Advanced***
3	1400–1565	1566–1588	**1589**–1598	1599–1720
4	1410–1571	1572–1593	**1594**–1611	1612–1750
5	1420–1570	1571–1595	**1596**–1629	1630–1780
6	1430–1573	1574–1604	**1605**–1656	1657–1800
7	1440–1597	1598–1617	**1618**–1653	1654–1820
8	1450–1594	1595–1621	**1622**–1651	1652–1840
9	1450–1599	1600–1628	**1629**–1673	1674–1850

MAP Growth Reading								
	Needs Support		***Approaching Proficient***		***Proficient***		***Advanced***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–159	1–20	160–183	21–77	**184**–193	78–91	194–350	92–99
3	100–175	1–25	176–196	26–72	**197**–204	73–86	205–350	87–99
4	100–187	1–29	188–203	30–66	**204**–214	67–85	215–350	86–99
5	100–188	1–16	189–205	17–53	**206**–223	54–87	224–350	88–99
6	100–192	1–14	193–211	15–53	**212**–234	54–92	235–350	93–99
7	100–211	1–44	212–221	45–67	**222**–236	68–91	237–350	92–99
8	100–213	1–40	214–225	41–67	**226**–237	68–87	238–350	88–99
9	100–215	1–43	216–227	44–67	**228**–241	68–88	242–350	89–99
Winter								
2	100–169	1–22	170–191	23–75	**192**–200	76–90	201–350	91–99
3	100–183	1–26	184–202	27–70	**203**–210	71–85	211–350	86–99
4	100–193	1–29	194–208	30–65	**209**–218	66–84	219–350	85–99
5	100–194	1–18	195–209	19–51	**210**–226	52–86	227–350	87–99
6	100–197	1–15	198–215	16–54	**216**–235	55–91	236–350	92–99
7	100–214	1–44	215–223	45–66	**224**–237	67–89	238–350	90–99
8	100–216	1–41	217–227	42–66	**228**–238	67–86	239–350	87–99
9	100–217	1–44	218–228	45–66	**229**–242	67–87	243–350	88–99
Spring								
2	100–174	1–24	175–195	25–74	**196**–204	75–89	205–350	90–99
3	100–187	1–28	188–205	29–70	**206**–212	71–83	213–350	84–99
4	100–196	1–31	197–210	32–64	**211**–220	65–83	221–350	84–99
5	100–197	1–20	198–211	21–52	**212**–227	53–85	228–350	86–99
6	100–199	1–16	200–216	17–53	**217**–236	54–90	237–350	91–99
7	100–215	1–43	216–224	44–65	**225**–238	66–89	239–350	90–99
8	100–217	1–40	218–228	41–66	**229**–239	67–85	240–350	86–99
9	100–218	1–44	219–229	45–66	**230**–243	67–87	244–350	88–99

Table 3.6. MAP Growth Cut Scores—Mathematics

AK STAR Summative Mathematics				
Grade	***Needs Support***	***Approaching Proficient***	***Proficient***	***Advanced***
3	1400–1512	1513–1527	**1528**–1547	1548–1720
4	1410–1525	1526–1541	**1542**–1554	1555–1750
5	1420–1530	1531–1543	**1544**–1576	1577–1780
6	1430–1542	1543–1565	**1566**–1593	1594–1800
7	1440–1551	1552–1584	**1585**–1631	1632–1820
8	1450–1586	1587–1609	**1610**–1643	1644–1840
9	1450–1577	1578–1604	**1605**–1646	1647–1850

MAP Growth Mathematics								
	Needs Support		***Approaching Proficient***		***Proficient***		***Advanced***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–168	1–31	169–180	32–67	**181**–193	68–92	194–350	93–99
3	100–182	1–33	183–193	34–65	**194**–204	66–88	205–350	89–99
4	100–194	1–37	195–204	38–64	**205**–211	65–80	212–350	81–99
5	100–201	1–31	202–209	32–51	**210**–226	52–87	227–350	88–99
6	100–207	1–33	208–218	34–59	**219**–231	60–85	232–350	86–99
7	100–215	1–39	216–229	40–70	**230**–247	71–93	248–350	94–99
8	100–232	1–66	233–241	67–81	**242**–254	82–93	255–350	94–99
9	100–235	1–68	236–244	69–82	**245**–258	83–94	259–350	95–99
Winter								
2	100–177	1–31	178–189	32–67	**190**–201	68–91	202–350	92–99
3	100–190	1–34	191–200	35–63	**201**–212	64–88	213–350	89–99
4	100–201	1–38	202–211	39–65	**212**–218	66–80	219–350	81–99
5	100–207	1–33	208–215	34–52	**216**–232	53–87	233–350	88–99
6	100–212	1–34	213–223	35–59	**224**–236	60–84	237–350	85–99
7	100–218	1–38	219–233	39–70	**234**–251	71–93	252–350	94–99
8	100–235	1–65	236–244	66–80	**245**–257	81–93	258–350	94–99
9	100–237	1–67	238–246	68–81	**247**–260	82–94	261–350	95–99
Spring								
2	100–183	1–33	184–194	34–65	**195**–206	66–89	207–350	90–99
3	100–195	1–35	196–205	36–63	**206**–216	64–86	217–350	87–99
4	100–205	1–38	206–215	39–63	**216**–222	64–78	223–350	79–99
5	100–211	1–33	212–219	34–52	**220**–236	53–85	237–350	86–99
6	100–215	1–34	216–226	35–58	**227**–239	59–83	240–350	84–99
7	100–221	1–39	222–236	40–70	**237**–254	71–93	255–350	94–99
8	100–237	1–64	238–246	65–79	**247**–259	80–92	260–350	93–99
9	100–238	1–66	239–247	67–80	**248**–261	81–93	262–350	94–99

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 AK STAR spring summative tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.85 to 0.88 for ELA/reading and 0.86 to 0.94 for mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the AK STAR summative assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on the AK STAR summative test in Grade 3.

Although the results show that MAP Growth scores can be used to predict student proficiency on the AK STAR summative tests with relatively high accuracy, there is a notable limitation to how these results should be used and interpreted. The MAP Growth and AK STAR summative 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	AK STAR		FP	FN				
ELA/Reading										
2	1,641	196	1589	0.86	0.10	0.30	0.70	0.90	0.63	0.91
3	5,985	206	1589	0.88	0.10	0.17	0.83	0.90	0.71	0.95
4	6,094	211	1594	0.86	0.13	0.15	0.85	0.87	0.75	0.94
5	5,871	212	1596	0.85	0.17	0.13	0.87	0.83	0.80	0.93
6	5,778	217	1605	0.86	0.15	0.14	0.86	0.85	0.82	0.94
7	5,738	225	1618	0.87	0.11	0.20	0.80	0.89	0.76	0.94
8	5,446	229	1622	0.86	0.10	0.23	0.77	0.90	0.79	0.93
9	4,688	230	1629	0.86	0.10	0.22	0.78	0.90	0.77	0.93
Mathematics										
2	1,621	195	1528	0.86	0.10	0.26	0.74	0.90	0.72	0.91
3	6,020	206	1528	0.89	0.08	0.16	0.84	0.92	0.80	0.96
4	6,039	216	1542	0.91	0.07	0.15	0.85	0.93	0.82	0.97
5	5,844	220	1544	0.88	0.10	0.14	0.86	0.90	0.85	0.96
6	5,774	227	1566	0.89	0.09	0.15	0.85	0.91	0.81	0.96
7	5,684	237	1585	0.92	0.05	0.17	0.83	0.95	0.81	0.97
8	5,081	247	1610	0.94	0.04	0.17	0.83	0.96	0.78	0.98
9	3,568	248	1605	0.91	0.04	0.27	0.73	0.96	0.83	0.96

*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 *Proficient* performance on the AK STAR summative test based on RIT scores from fall, winter, or spring. Due to measurement error in all test scores, the *Proficient* MAP Growth cuts do not guarantee that a student will reach proficiency on the AK STAR summative test. They instead indicate a 50% chance that a student will reach a particular performance level. Therefore, these projections further elucidate the *Proficient* cut scores by providing the likelihood of reaching proficiency on the AK STAR spring summative assessment at a given percentile throughout the year.

For example, the Grade 4 winter *Proficient* RIT cut score for reading is 209, which indicates a 50% chance of achieving proficiency in the spring, as shown in Table 3.8. However, an educator can also use the table to estimate that a Grade 4 student who obtained a MAP Growth Reading score of 219 in the winter has a 97% probability of reaching *Proficient* or higher on the AK STAR spring summative assessment.

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

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

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
3	5	206	159	No	<0.01	167	No	<0.01	170	No	<0.01	
	10	206	165	No	<0.01	173	No	<0.01	176	No	<0.01	
	15	206	169	No	<0.01	177	No	<0.01	180	No	<0.01	
	20	206	173	No	<0.01	180	No	<0.01	183	No	<0.01	
	25	206	175	No	0.01	183	No	<0.01	186	No	<0.01	
	30	206	178	No	0.02	185	No	<0.01	189	No	<0.01	
	35	206	180	No	0.02	188	No	<0.01	191	No	<0.01	
	40	206	182	No	0.04	190	No	0.01	193	No	<0.01	
	45	206	185	No	0.09	192	No	0.02	195	No	<0.01	
	50	206	187	No	0.11	194	No	0.05	197	No	<0.01	
	55	206	189	No	0.17	196	No	0.09	199	No	0.01	
	60	206	191	No	0.25	198	No	0.17	201	No	0.06	
	65	206	193	No	0.34	200	No	0.29	203	No	0.17	
	70	206	195	No	0.39	202	No	0.43	206	Yes	0.50	
	75	206	198	Yes	0.55	205	Yes	0.65	208	Yes	0.73	
	80	206	201	Yes	0.70	207	Yes	0.77	211	Yes	0.94	
	85	206	204	Yes	0.79	211	Yes	0.91	214	Yes	0.99	
	90	206	208	Yes	0.91	215	Yes	0.98	218	Yes	>0.99	
	95	206	214	Yes	0.98	220	Yes	>0.99	224	Yes	>0.99	
4	5	211	169	No	<0.01	176	No	<0.01	178	No	<0.01	
	10	211	175	No	<0.01	182	No	<0.01	184	No	<0.01	
	15	211	179	No	<0.01	186	No	<0.01	188	No	<0.01	
	20	211	183	No	0.01	189	No	<0.01	191	No	<0.01	
	25	211	185	No	0.01	192	No	<0.01	194	No	<0.01	
	30	211	188	No	0.03	194	No	<0.01	196	No	<0.01	
	35	211	190	No	0.05	196	No	0.01	199	No	<0.01	
	40	211	192	No	0.08	198	No	0.03	201	No	<0.01	
	45	211	195	No	0.13	200	No	0.04	203	No	0.01	
	50	211	197	No	0.20	202	No	0.09	205	No	0.03	
	55	211	199	No	0.29	205	No	0.22	207	No	0.11	
	60	211	201	No	0.39	207	No	0.35	209	No	0.27	
	65	211	203	No	0.44	209	Yes	0.50	211	Yes	0.50	
	70	211	205	Yes	0.56	211	Yes	0.65	213	Yes	0.73	
	75	211	208	Yes	0.71	213	Yes	0.78	216	Yes	0.94	
	80	211	211	Yes	0.80	216	Yes	0.91	219	Yes	0.99	
	85	211	214	Yes	0.89	219	Yes	0.97	222	Yes	>0.99	
	90	211	218	Yes	0.95	223	Yes	0.99	226	Yes	>0.99	
	95	211	224	Yes	0.99	229	Yes	>0.99	232	Yes	>0.99	

ELA/Reading											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.
5	5	212	178	No	<0.01	183	No	<0.01	185	No	<0.01
	10	212	183	No	<0.01	189	No	<0.01	191	No	<0.01
	15	212	187	No	0.01	193	No	<0.01	194	No	<0.01
	20	212	191	No	0.04	196	No	0.01	198	No	<0.01
	25	212	193	No	0.06	198	No	0.01	200	No	<0.01
	30	212	196	No	0.13	201	No	0.04	203	No	<0.01
	35	212	198	No	0.17	203	No	0.09	205	No	0.01
	40	212	200	No	0.24	205	No	0.17	207	No	0.06
	45	212	202	No	0.34	207	No	0.28	209	No	0.17
	50	212	204	No	0.44	209	No	0.42	211	No	0.38
	55	212	207	Yes	0.56	211	Yes	0.58	213	Yes	0.62
	60	212	209	Yes	0.66	213	Yes	0.72	215	Yes	0.83
	65	212	211	Yes	0.76	215	Yes	0.83	217	Yes	0.94
	70	212	213	Yes	0.80	217	Yes	0.87	219	Yes	0.99
	75	212	216	Yes	0.89	220	Yes	0.96	222	Yes	>0.99
	80	212	218	Yes	0.94	222	Yes	0.98	224	Yes	>0.99
	85	212	221	Yes	0.96	226	Yes	>0.99	228	Yes	>0.99
	90	212	225	Yes	0.99	229	Yes	>0.99	231	Yes	>0.99
	95	212	231	Yes	>0.99	235	Yes	>0.99	237	Yes	>0.99
6	5	217	183	No	<0.01	188	No	<0.01	189	No	<0.01
	10	217	189	No	<0.01	193	No	<0.01	195	No	<0.01
	15	217	193	No	0.01	197	No	<0.01	199	No	<0.01
	20	217	196	No	0.02	200	No	<0.01	202	No	<0.01
	25	217	199	No	0.06	203	No	0.01	205	No	<0.01
	30	217	202	No	0.10	205	No	0.03	207	No	<0.01
	35	217	204	No	0.16	208	No	0.09	209	No	0.01
	40	217	206	No	0.24	210	No	0.17	211	No	0.03
	45	217	208	No	0.28	212	No	0.28	213	No	0.11
	50	217	210	No	0.39	214	No	0.42	215	No	0.27
	55	217	212	Yes	0.50	216	Yes	0.50	217	Yes	0.50
	60	217	214	Yes	0.61	218	Yes	0.65	219	Yes	0.73
	65	217	217	Yes	0.72	220	Yes	0.78	222	Yes	0.94
	70	217	219	Yes	0.81	222	Yes	0.88	224	Yes	0.99
	75	217	221	Yes	0.87	225	Yes	0.96	226	Yes	>0.99
	80	217	224	Yes	0.92	227	Yes	0.98	229	Yes	>0.99
	85	217	227	Yes	0.97	230	Yes	>0.99	232	Yes	>0.99
	90	217	231	Yes	0.99	234	Yes	>0.99	236	Yes	>0.99
	95	217	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
7	5	225	187	No	<0.01	190	No	<0.01	191	No	<0.01	
	10	225	193	No	<0.01	196	No	<0.01	197	No	<0.01	
	15	225	197	No	<0.01	200	No	<0.01	201	No	<0.01	
	20	225	200	No	<0.01	203	No	<0.01	205	No	<0.01	
	25	225	203	No	0.01	206	No	<0.01	207	No	<0.01	
	30	225	206	No	0.02	209	No	<0.01	210	No	<0.01	
	35	225	208	No	0.04	211	No	0.01	212	No	<0.01	
	40	225	210	No	0.08	213	No	0.02	214	No	<0.01	
	45	225	212	No	0.10	215	No	0.04	216	No	<0.01	
	50	225	214	No	0.16	217	No	0.09	218	No	0.01	
	55	225	216	No	0.24	219	No	0.17	220	No	0.06	
	60	225	218	No	0.33	221	No	0.28	223	No	0.27	
	65	225	221	No	0.44	223	No	0.42	225	Yes	0.50	
	70	225	223	Yes	0.56	226	Yes	0.65	227	Yes	0.73	
	75	225	225	Yes	0.67	228	Yes	0.78	229	Yes	0.89	
	80	225	228	Yes	0.81	231	Yes	0.91	232	Yes	0.99	
	85	225	231	Yes	0.88	234	Yes	0.97	235	Yes	>0.99	
	90	225	235	Yes	0.96	238	Yes	>0.99	239	Yes	>0.99	
	95	225	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99	
8	5	229	190	No	<0.01	193	No	<0.01	194	No	<0.01	
	10	229	196	No	<0.01	199	No	<0.01	200	No	<0.01	
	15	229	200	No	<0.01	203	No	<0.01	204	No	<0.01	
	20	229	204	No	<0.01	206	No	<0.01	207	No	<0.01	
	25	229	207	No	0.01	209	No	<0.01	210	No	<0.01	
	30	229	209	No	0.02	212	No	<0.01	213	No	<0.01	
	35	229	211	No	0.03	214	No	<0.01	215	No	<0.01	
	40	229	214	No	0.06	216	No	0.01	217	No	<0.01	
	45	229	216	No	0.11	218	No	0.03	220	No	<0.01	
	50	229	218	No	0.17	221	No	0.09	222	No	0.01	
	55	229	220	No	0.20	223	No	0.17	224	No	0.06	
	60	229	222	No	0.29	225	No	0.28	226	No	0.17	
	65	229	225	No	0.45	227	No	0.42	228	No	0.38	
	70	229	227	Yes	0.55	229	Yes	0.58	231	Yes	0.73	
	75	229	230	Yes	0.66	232	Yes	0.78	233	Yes	0.89	
	80	229	232	Yes	0.76	235	Yes	0.91	236	Yes	0.99	
	85	229	236	Yes	0.89	238	Yes	0.97	239	Yes	>0.99	
	90	229	240	Yes	0.96	242	Yes	>0.99	243	Yes	>0.99	
	95	229	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

ELA/Reading											
			Fall			Winter			Spring		
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.
9	5	230	188	No	<0.01	190	No	<0.01	190	No	<0.01
	10	230	195	No	<0.01	197	No	<0.01	197	No	<0.01
	15	230	199	No	<0.01	201	No	<0.01	202	No	<0.01
	20	230	203	No	<0.01	205	No	<0.01	205	No	<0.01
	25	230	206	No	0.01	208	No	<0.01	209	No	<0.01
	30	230	209	No	0.01	211	No	<0.01	211	No	<0.01
	35	230	212	No	0.03	213	No	<0.01	214	No	<0.01
	40	230	214	No	0.05	216	No	0.01	217	No	<0.01
	45	230	217	No	0.11	218	No	0.02	219	No	<0.01
	50	230	219	No	0.13	221	No	0.07	221	No	<0.01
	55	230	221	No	0.19	223	No	0.14	224	No	0.03
	60	230	224	No	0.31	225	No	0.23	226	No	0.11
	65	230	226	No	0.40	228	No	0.43	229	No	0.38
	70	230	229	Yes	0.55	230	Yes	0.57	231	Yes	0.62
	75	230	232	Yes	0.69	233	Yes	0.77	234	Yes	0.89
	80	230	235	Yes	0.81	236	Yes	0.90	237	Yes	0.99
	85	230	239	Yes	0.91	240	Yes	0.98	241	Yes	>0.99
	90	230	243	Yes	0.97	245	Yes	>0.99	246	Yes	>0.99
	95	230	250	Yes	>0.99	251	Yes	>0.99	253	Yes	>0.99

Table 3.9. Proficiency Projections based on RIT Scores—Mathematics

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

Mathematics												
			Fall			Winter			Spring			
				Projected Proficiency			Projected Proficiency			Projected Proficiency		
Grade	Start %ile	Spring Cut	Fall RIT	*Proficient*	Prob.	Winter RIT	*Proficient*	Prob.	Spring RIT	*Proficient*	Prob.	
4	5	216	176	No	<0.01	182	No	<0.01	185	No	<0.01	
	10	216	181	No	<0.01	187	No	<0.01	191	No	<0.01	
	15	216	185	No	<0.01	191	No	<0.01	194	No	<0.01	
	20	216	187	No	<0.01	194	No	<0.01	197	No	<0.01	
	25	216	190	No	0.01	196	No	<0.01	200	No	<0.01	
	30	216	192	No	0.02	198	No	<0.01	202	No	<0.01	
	35	216	194	No	0.04	200	No	0.01	205	No	<0.01	
	40	216	196	No	0.07	202	No	0.02	207	No	<0.01	
	45	216	198	No	0.13	204	No	0.04	209	No	0.01	
	50	216	200	No	0.21	206	No	0.10	211	No	0.04	
	55	216	201	No	0.26	208	No	0.20	212	No	0.08	
	60	216	203	No	0.37	210	No	0.33	214	No	0.25	
	65	216	205	Yes	0.50	212	Yes	0.50	217	Yes	0.63	
	70	216	207	Yes	0.63	214	Yes	0.67	219	Yes	0.85	
	75	216	209	Yes	0.74	216	Yes	0.80	221	Yes	0.96	
	80	216	212	Yes	0.87	219	Yes	0.93	224	Yes	>0.99	
	85	216	214	Yes	0.93	221	Yes	0.97	227	Yes	>0.99	
	90	216	218	Yes	0.98	225	Yes	>0.99	230	Yes	>0.99	
	95	216	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	
5	5	220	184	No	<0.01	189	No	<0.01	191	No	<0.01	
	10	220	190	No	<0.01	194	No	<0.01	197	No	<0.01	
	15	220	193	No	<0.01	198	No	<0.01	201	No	<0.01	
	20	220	196	No	0.01	201	No	<0.01	205	No	<0.01	
	25	220	199	No	0.03	204	No	0.01	207	No	<0.01	
	30	220	201	No	0.08	206	No	0.02	210	No	<0.01	
	35	220	203	No	0.14	209	No	0.07	212	No	<0.01	
	40	220	205	No	0.22	211	No	0.15	215	No	0.04	
	45	220	207	No	0.32	213	No	0.26	217	No	0.15	
	50	220	209	No	0.44	215	No	0.42	219	No	0.37	
	55	220	211	Yes	0.56	217	Yes	0.58	221	Yes	0.63	
	60	220	213	Yes	0.68	219	Yes	0.74	223	Yes	0.85	
	65	220	215	Yes	0.78	221	Yes	0.85	225	Yes	0.96	
	70	220	217	Yes	0.86	223	Yes	0.93	228	Yes	>0.99	
	75	220	219	Yes	0.92	225	Yes	0.97	230	Yes	>0.99	
	80	220	222	Yes	0.97	228	Yes	0.99	233	Yes	>0.99	
	85	220	225	Yes	0.99	231	Yes	>0.99	236	Yes	>0.99	
	90	220	229	Yes	>0.99	235	Yes	>0.99	240	Yes	>0.99	
	95	220	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99	

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
6	5	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	237	192	No	<0.01	194	No	<0.01	196	No	<0.01	
	10	237	198	No	<0.01	201	No	<0.01	203	No	<0.01	
	15	237	202	No	<0.01	205	No	<0.01	207	No	<0.01	
	20	237	206	No	<0.01	209	No	<0.01	211	No	<0.01	
	25	237	208	No	<0.01	212	No	<0.01	214	No	<0.01	
	30	237	211	No	<0.01	215	No	<0.01	217	No	<0.01	
	35	237	213	No	<0.01	217	No	<0.01	220	No	<0.01	
	40	237	216	No	0.01	219	No	<0.01	222	No	<0.01	
	45	237	218	No	0.03	222	No	<0.01	224	No	<0.01	
	50	237	220	No	0.05	224	No	0.02	227	No	<0.01	
	55	237	222	No	0.10	226	No	0.04	229	No	<0.01	
	60	237	225	No	0.21	229	No	0.14	231	No	0.02	
	65	237	227	No	0.31	231	No	0.26	234	No	0.15	
	70	237	229	No	0.44	233	No	0.42	236	No	0.37	
	75	237	232	Yes	0.63	236	Yes	0.67	239	Yes	0.75	
	80	237	235	Yes	0.79	239	Yes	0.86	242	Yes	0.96	
	85	237	238	Yes	0.90	243	Yes	0.97	246	Yes	>0.99	
	90	237	243	Yes	0.98	247	Yes	>0.99	251	Yes	>0.99	
	95	237	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Proficient	Prob.		*Proficient*	Prob.		*Proficient*	Prob.	
8	5	247	194	No	<0.01	196	No	<0.01	197	No	<0.01	
	10	247	201	No	<0.01	203	No	<0.01	205	No	<0.01	
	15	247	205	No	<0.01	208	No	<0.01	210	No	<0.01	
	20	247	209	No	<0.01	212	No	<0.01	214	No	<0.01	
	25	247	212	No	<0.01	215	No	<0.01	217	No	<0.01	
	30	247	215	No	<0.01	218	No	<0.01	220	No	<0.01	
	35	247	218	No	<0.01	221	No	<0.01	223	No	<0.01	
	40	247	220	No	<0.01	223	No	<0.01	225	No	<0.01	
	45	247	223	No	<0.01	226	No	<0.01	228	No	<0.01	
	50	247	225	No	0.01	228	No	<0.01	230	No	<0.01	
	55	247	227	No	0.02	231	No	<0.01	233	No	<0.01	
	60	247	230	No	0.04	233	No	0.01	235	No	<0.01	
	65	247	232	No	0.07	236	No	0.03	238	No	<0.01	
	70	247	235	No	0.16	238	No	0.07	241	No	0.02	
	75	247	238	No	0.28	241	No	0.20	244	No	0.15	
	80	247	241	No	0.44	244	No	0.42	247	Yes	0.50	
	85	247	245	Yes	0.67	248	Yes	0.73	251	Yes	0.92	
	90	247	249	Yes	0.84	253	Yes	0.95	256	Yes	>0.99	
	95	247	256	Yes	0.98	260	Yes	>0.99	263	Yes	>0.99	
9	5	248	194	No	<0.01	196	No	<0.01	196	No	<0.01	
	10	248	201	No	<0.01	203	No	<0.01	204	No	<0.01	
	15	248	206	No	<0.01	208	No	<0.01	209	No	<0.01	
	20	248	210	No	<0.01	212	No	<0.01	213	No	<0.01	
	25	248	213	No	<0.01	215	No	<0.01	216	No	<0.01	
	30	248	216	No	<0.01	218	No	<0.01	219	No	<0.01	
	35	248	219	No	<0.01	221	No	<0.01	222	No	<0.01	
	40	248	221	No	<0.01	224	No	<0.01	225	No	<0.01	
	45	248	224	No	<0.01	226	No	<0.01	227	No	<0.01	
	50	248	226	No	0.01	229	No	<0.01	230	No	<0.01	
	55	248	229	No	0.02	231	No	<0.01	233	No	<0.01	
	60	248	231	No	0.03	234	No	<0.01	235	No	<0.01	
	65	248	234	No	0.07	236	No	0.01	238	No	<0.01	
	70	248	237	No	0.14	239	No	0.05	241	No	0.01	
	75	248	240	No	0.25	242	No	0.16	244	No	0.08	
	80	248	243	No	0.39	246	No	0.42	247	No	0.37	
	85	248	247	Yes	0.61	249	Yes	0.66	251	Yes	0.85	
	90	248	252	Yes	0.83	254	Yes	0.92	256	Yes	>0.99	
	95	248	259	Yes	0.97	262	Yes	>0.99	264	Yes	>0.99	

4. References

He, W., & Meyer, J. (2021). *MAP Growth universal screening benchmarks: Establishing MAP Growth as an effective universal screener*. NWEA Research Report. https://www.nwea.org/content/uploads/2021/05/MAP-Growth-Universal-Screening-Benchmarks-2021-03-12_NWEA_report.pdf

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

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

Pommerich, M., Hanson, B., Harris, D., & Sconing, J. (2004). Issues in conducting linkage between distinct tests. *Applied Psychological Measurement*, *28*(4), 247–273.

Thum, Y. M., & Kuhfeld, M. (2020). *NWEA 2020 MAP Growth achievement status and growth norms for students and schools*. NWEA Research Report. https://teach.mapnwea.org/impl/normsResearchStudy.pdf