Linking Study Report: Predicting Performance on the Massachusetts Comprehensive Assessment System (MCAS) 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 Massachusetts Comprehensive Assessment System (MCAS) in Grades 3–8 English Language Arts (ELA) and Mathematics, NWEA® conducted a linking study using Spring 2017 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the MCAS achievement levels. With this information, educators can identify students at risk of failing to meet state proficiency standards early in the year and provide tailored educational interventions. The linking study has been updated since the previous version published in June 2018 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020).

Table E.1 presents the MCAS *Meeting Expectations* 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 *Meeting Expectations* cut score on the MCAS Grade 3 ELA test is 500. A Grade 3 student with a MAP Growth Reading RIT score of 193 in the fall is likely to meet proficiency on the MCAS ELA test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 193 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 MCAS 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., Grade 2 to 3).

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

Assessment		*Meeting Expectations* Cut Scores by Grade						
		2	**3**	**4**	**5**	**6**	**7**	**8**
ELA/Reading								
MCAS Spring		–	500	500	500	500	500	500
MAP Growth	Fall	181	193	204	210	217	219	223
	Winter	189	200	209	214	220	222	225
	Spring	193	203	211	216	221	223	226
Mathematics								
MCAS Spring		–	500	500	500	500	500	500
MAP Growth	Fall	180	193	206	217	220	228	234
	Winter	189	200	213	223	225	232	237
	Spring	194	205	217	227	228	235	239

Please note that the results in this report may differ from those found in the NWEA reporting system for individual districts. The typical growth scores from fall to spring or winter to spring used in this report are based on the default instructional weeks most commonly encountered for each term (i.e., Weeks 4, 20, and 32 for fall, winter, and spring, respectively). However, instructional weeks often vary by district, so the cut scores in this report may differ slightly from the MAP Growth score reports that reflect spring instructional weeks set by partners.

E.1. Assessment Overview

The MCAS Grades 3–8 ELA and Mathematics tests are Massachusetts' state summative assessments aligned to the Massachusetts curriculum frameworks. Based on their test scores, students are placed into one of four achievement levels: *Not Meeting Expectations*, *Partially Meeting Expectations*, *Meeting Expectations*, and *Exceeding Expectations*. These tests are used to provide evidence of student achievement in ELA and Mathematics for various test score uses such as determining school and district progress toward the goals set by the state and federal accountability systems. The *Meeting Expectations* cut score demarks the minimum level of achievement considered to be proficient. MAP Growth tests are adaptive interim assessments aligned to state-specific content standards and administered in the fall, winter, and spring. Scores are reported on the RIT vertical scale with a range of 100–350.

E.2. Linking Methods

Based on scores from the Spring 2017 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring MCAS 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 MCAS test were then projected using the 2020 NWEA growth norms that provide expected score gains across test administrations.

E.3. Student Sample

Only students who took both the MAP Growth and MCAS assessments in Spring 2017 were included in the study sample. Table E.2 presents the number of Massachusetts students from eight districts and 73 schools who were included in the linking study.

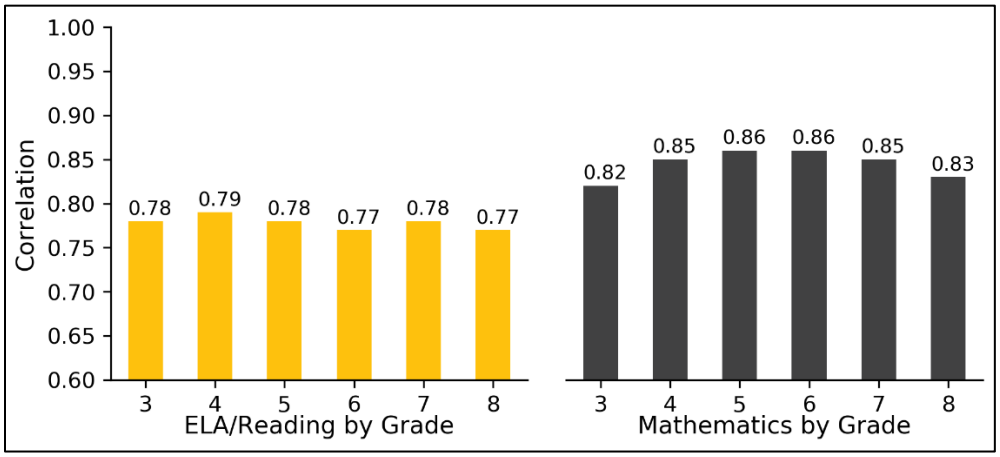
Table E.2. Linking Study Sample

	#Students	
Grade	ELA/Reading	Mathematics
3	2,389	2,649
4	2,650	2,858
5	2,516	2,835
6	2,045	2,436
7	1,414	1,381
8	1,218	1,172

E.4. Test Score Relationships

Correlations between MAP Growth RIT scores and MCAS scores range from 0.77 to 0.86 across both content areas, as shown in Figure E.1. These values indicate a strong relationship among the scores, which is important validity evidence for the claim that MAP Growth scores are good predictors of performance on the MCAS assessments.

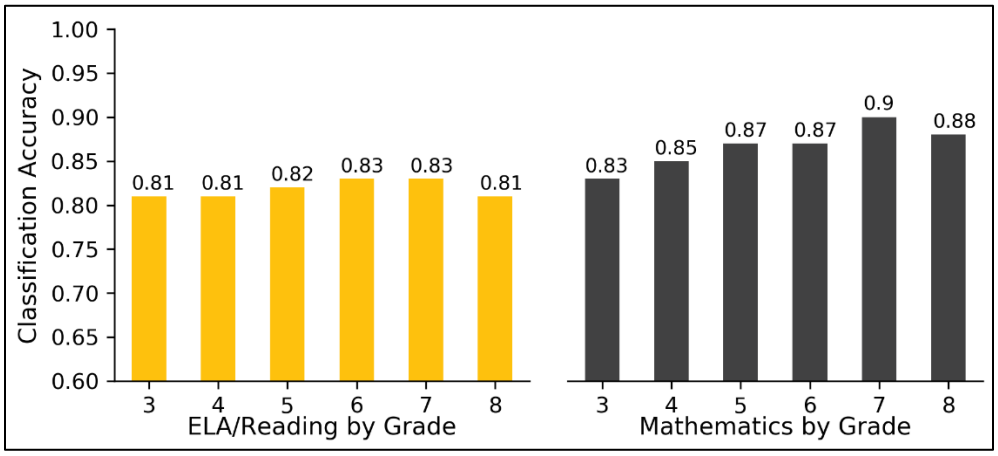
Figure E.1. Correlations between MAP Growth and MCAS



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 MCAS tests. For example, the MAP Growth Reading Grade 3 *Meeting Expectations* cut score has a 0.81 accuracy rate, meaning it accurately classified student achievement on the state test for 81% of the sample. The results range from 0.81 to 0.90 across both content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the MCAS tests.

Figure E.2. Accuracy of MAP Growth Classifications



1. Introduction

1.1. Purpose of the Study

NWEA® is committed to providing partners with useful tools to help make inferences about student learning from MAP® Growth™ test scores. One important use of MAP Growth results is to predict a student's performance on the state summative assessment at different times throughout the year. This allows educators and parents to determine if a student is on track in their learning to meet state standards by the end of the year or, given a student's learning profile, is on track to obtain rigorous, realistic growth in their content knowledge and skills.

This document presents results from a linking study conducted by NWEA in July 2020 to statistically connect the scores of the Massachusetts Comprehensive Assessment System (MCAS) in Grades 3–8 English Language Arts (ELA) and Mathematics with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2017 term. The linking study has been updated since the previous version published in June 2018 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 MCAS test by Grade 3. This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth cut scores that correspond to the MCAS achievement levels using the equipercentile linking procedure for the spring results and the 2020 norms for the fall and winter results
4. Classification accuracy statistics to determine the degree to which MAP Growth accurately predicts student proficiency status on the MCAS tests
5. The probability of achieving grade-level proficiency on the MCAS assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The MCAS Grades 3–8 ELA and Mathematics summative assessments are aligned to the Massachusetts curriculum frameworks. 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: *Not Meeting Expectations*, *Partially Meeting Expectations*, *Meeting Expectations*, and *Exceeding Expectations*. The *Meeting Expectations* cut score demarks the minimum level of performance considered to be proficient for accountability purposes.

MAP Growth interim assessments from NWEA are computer adaptive and aligned to state-specific content standards. Scores are reported on the RIT vertical scale with a range of 100–350. Each content area has its own scale. To aid the interpretation of scores, NWEA periodically conducts norming studies of student and school performance on MAP Growth. Achievement status norms show how well a student performed on the MAP Growth test compared to students in the norming group by associating the student's performance on the MAP Growth test, expressed as a RIT score, with a percentile ranking. Growth norms provide expected score gains across test administrations (e.g., the relative evaluation of a student's growth from fall to spring). The most recent norms study was conducted in 2020 (Thum & Kuhfeld, 2020).

2. Methods

2.1. Data Collection

This linking study is based on data from the Spring 2017 administrations of the MAP Growth and MCAS assessments. NWEA recruited Massachusetts districts to participate in the study by sharing their student and score data for the target term. Districts also gave NWEA permission to access students' associated MAP Growth scores from the NWEA in-house database. Once Massachusetts 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 MCAS assessments in Spring 2017 were included in the study sample.

2.2. 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 MCAS 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 MCAS 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 compare 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 MCAS spring data used in the study. The equipercentile linking procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of tests at or below each score). For example, let x represent a score on Test X (e.g., MCAS). 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 MCAS on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on MCAS, 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.

2.3. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the MCAS tests can be described using classification accuracy statistics based on the MAP Growth RIT spring cut scores that show the proportion of students correctly classified by their RIT scores as proficient (*Meeting Expectations* or *Exceeding Expectations*) or not proficient (*Not Meeting Expectations* or *Partially Meeting Expectations*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich, Hanson, Harris, & Sconing, 2004). The results are based on the Spring 2017 MAP Growth and MCAS data for the *Meeting Expectations* cut score.

Since Massachusetts students do not begin taking the MCAS assessment until Grade 3, longitudinal data were collected for the 2016–2017 Grade 3 cohort in order to link the MCAS assessment to MAP Growth for Grade 2 to calculate the classification accuracy statistics. To accomplish this, 2016–2017 MCAS Grade 3 results were linked to MAP Growth data from Grade 3 students in 2016–2017 and Grade 2 students in 2015–2016. 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.

2.4. 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 MCAS 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 *Meeting Expectations* proficiency on the MCAS test based on their fall or winter RIT score:

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

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 *Meeting Expectations* 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 *Meeting Expectations* proficiency on the MCAS test based on their spring RIT score (RIT_{Spring}):

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

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 MCAS assessments in Spring 2017 were included in the study sample. Data used in this study were collected from eight districts and 73 schools in Massachusetts. Table 3.1 presents the demographic distributions of race, sex, and achievement level in the study sample.

Table 3.1. Linking Study Sample Demographics

Linking Study Sample							
		%Students by Grade					
Demographic Subgroup		3	4	5	6	7	8
ELA/Reading							
	Total N	2,389	2,650	2,516	2,045	1,414	1,218
Race	Asian	2.4	3.9	4.0	2.5	1.1	1.1
	Black	8.5	7.7	8.5	8.8	5.0	6.9
	Hispanic	4.3	2.9	2.0	7.1	18.7	20.2
	Multi-Race	1.2	0.5	0.9	1.2	2.5	1.5
	Other	48.3	43.4	44.3	45.4	40.7	37.8
	White	35.2	41.5	40.4	35.0	31.9	32.5
Sex	Female	49.5	50.2	51.5	49.9	50.2	49.8
	Male	50.5	49.8	48.5	50.1	49.8	50.2
Achievement Level	*Not Meeting*	16.5	12.2	11.7	14.0	16.5	21.0
	Partially Meeting	49.1	48.8	50.0	51.5	47.7	45.3
	Meeting	30.5	34.4	34.7	31.8	33.2	30.2
	Exceeding	4.0	4.7	3.6	2.7	2.5	3.4
Mathematics							
	Total N	2,649	2,858	2,835	2,436	1,381	1,172
Race	Asian	2.9	4.5	4.4	3.2	1.0	0.9
	Black	9.2	8.3	9.2	9.6	4.8	6.4
	Hispanic	3.9	2.7	1.7	6.1	19.8	21.0
	Multi-Race	1.1	0.5	0.8	1.0	2.7	1.4
	Other	47.7	43.3	44.5	45.9	39.0	38.1
	White	35.1	40.8	39.4	34.2	32.7	32.3
Sex	Female	49.3	50.1	51.0	50.5	50.2	48.8
	Male	50.7	49.9	49.0	49.5	49.8	51.2
Achievement Level	*Not Meeting*	17.1	14.8	12.1	16.9	17.8	18.4
	Partially Meeting	47.8	45.3	53.7	49.6	50.3	53.2
	Meeting	31.2	36.7	31.5	31.4	28.8	25.3
	Exceeding	3.9	3.2	2.8	2.1	3.1	3.1

3.2. Descriptive Statistics

Table 3.2 presents descriptive statistics of the MAP Growth and MCAS test scores from Spring 2017, including the correlation coefficient (*r*) between them. The correlation coefficients between the scores range from 0.77 to 0.79 for ELA/Reading and 0.82 to 0.86 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 MCAS tests.

Table 3.2. Descriptive Statistics of Test Scores

			MCAS*				MAP Growth*			
Grade	**N**	***r***	**Mean**	**SD**	**Min.**	**Max.**	**Mean**	**SD**	**Min.**	**Max.**
ELA/Reading										
3	2,389	0.78	491.4	20.9	441	560	195.5	16.3	146	241
4	2,650	0.79	494.2	20.9	441	560	205.1	15.7	146	244
5	2,516	0.78	493.7	19.7	442	560	209.9	16.4	146	247
6	2,045	0.77	491.1	20.0	442	560	212.4	16.2	147	254
7	1,414	0.78	491.2	21.0	441	560	214.8	17.4	151	256
8	1,218	0.77	488.9	21.8	441	554	215.6	19.3	148	258
Mathematics										
3	2,649	0.82	491.4	21.8	441	560	200.0	13.5	138	265
4	2,858	0.85	493.1	21.3	440	557	211.9	14.6	146	258
5	2,835	0.86	492.5	19.4	443	560	219.4	17.0	156	268
6	2,436	0.86	490.6	20.4	441	550	220.4	17.2	146	262
7	1,381	0.85	490.1	20.8	440	560	225.1	19.3	149	276
8	1,172	0.83	489.1	20.7	441	560	226.3	21.5	142	277

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

3.3. MAP Growth Cut Scores

Table 3.3 and Table 3.4 present the MCAS 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 MCAS spring assessment when MAP Growth is taken in the fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading RIT score of 193 in the fall is likely to reach *Meeting Expectations* proficiency on the MCAS ELA test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 203 in the spring is also likely to reach *Meeting Expectations* proficiency on the MCAS. The spring cut score is higher than the fall cut score because growth is expected between fall and spring as students receive more instruction during the school year.

Within this report, the cut scores for fall and winter are derived from the spring cuts and the typical growth scores from fall-to-spring or winter-to-spring. The typical growth scores are based on the default instructional weeks most commonly encountered for each term (Weeks 4, 20, and 32 for fall, winter, and spring, respectively). Since instructional weeks often vary by district, the cut scores in this report may differ slightly from the MAP Growth score reports that reflect instructional weeks set by partners. If the actual instructional weeks deviate from the default ones, a student's projected 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' profile, classroom, and grade reports in the NWEA reporting system since they reflect the specific instructional weeks set by partners.

Table 3.3. MAP Growth Cut Scores—ELA/Reading

MCAS ELA								
Grade	***Not Meeting***		***Partially Meeting***		***Meeting***		***Exceeding***	
3	440–469		470–499		**500**–529		530–560	
4	440–469		470–499		**500**–529		530–560	
5	440–469		470–499		**500**–529		530–560	
6	440–469		470–499		**500**–529		530–560	
7	440–469		470–499		**500**–529		530–560	
8	440–469		470–499		**500**–529		530–560	
MAP Growth Reading*								
	Not Meeting		***Partially Meeting***		***Meeting***		***Exceeding***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–148	1–5	149–180	6–71	**181**–206	72–98	207–350	99–99
3	100–166	1–11	167–192	12–64	**193**–214	65–95	215–350	96–99
4	100–176	1–11	177–203	12–66	**204**–222	67–93	223–350	94–99
5	100–180	1–7	181–209	8–62	**210**–232	63–95	233–350	96–99
6	100–188	1–9	189–216	10–65	**217**–235	66–93	236–350	94–99
7	100–193	1–10	194–218	11–60	**219**–240	61–94	241–350	95–99
8	100–196	1–10	197–222	11–61	**223**–242	62–92	243–350	93–99
Winter								
2	100–159	1–7	160–188	8–69	**189**–212	70–97	213–350	98–99
3	100–175	1–12	176–199	13–64	**200**–219	65–94	220–350	95–99
4	100–184	1–13	185–208	14–65	**209**–226	66–92	227–350	93–99
5	100–187	1–8	188–213	9–61	**214**–234	62–94	235–350	95–99
6	100–193	1–10	194–219	11–64	**220**–236	65–92	237–350	93–99
7	100–197	1–11	198–221	12–61	**222**–241	62–93	242–350	94–99
8	100–200	1–11	201–224	12–60	**225**–243	61–91	244–350	92–99
Spring								
2	100–164	1–8	165–192	9–67	**193**–215	68–97	216–350	98–99
3	100–179	1–14	180–202	15–63	**203**–221	64–93	222–350	94–99
4	100–187	1–14	188–210	15–64	**211**–227	65–91	228–350	92–99
5	100–190	1–10	191–215	11–61	**216**–235	62–93	236–350	94–99
6	100–196	1–12	197–220	13–63	**221**–237	64–91	238–350	92–99
7	100–199	1–12	200–222	13–60	**223**–242	61–92	243–350	93–99
8	100–202	1–12	203–225	13–59	**226**–244	60–91	245–350	92–99

*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 3.4. MAP Growth Cut Scores—Mathematics

MCAS Mathematics								
Grade	***Not Meeting***		***Partially Meeting***		***Meeting***		***Exceeding***	
3	440–469		470–499		**500**–529		530–560	
4	440–469		470–499		**500**–529		530–560	
5	440–469		470–499		**500**–529		530–560	
6	440–469		470–499		**500**–529		530–560	
7	440–469		470–499		**500**–529		530–560	
8	440–469		470–499		**500**–529		530–560	
MAP Growth Mathematics*								
	Not Meeting		***Partially Meeting***		***Meeting***		***Exceeding***	
Grade	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
Fall								
2	100–158	1–10	159–179	11–64	**180**–200	65–97	201–350	98–99
3	100–174	1–15	175–192	16–62	**193**–211	63–95	212–350	96–99
4	100–186	1–18	187–205	19–66	**206**–224	67–95	225–350	96–99
5	100–190	1–11	191–216	12–69	**217**–238	70–97	239–350	98–99
6	100–196	1–13	197–219	14–62	**220**–243	63–96	244–350	97–99
7	100–201	1–14	202–227	15–66	**228**–249	67–95	250–350	96–99
8	100–202	1–11	203–233	12–67	**234**–254	68–93	255–350	94–99
Winter								
2	100–168	1–11	169–188	12–64	**189**–207	65–96	208–350	97–99
3	100–182	1–16	183–199	17–60	**200**–218	61–94	219–350	95–99
4	100–192	1–18	193–212	19–67	**213**–231	68–95	232–350	96–99
5	100–195	1–11	196–222	12–69	**223**–244	70–96	245–350	97–99
6	100–201	1–14	202–224	15–62	**225**–248	63–95	249–350	96–99
7	100–204	1–13	205–231	14–66	**232**–253	67–94	254–350	95–99
8	100–206	1–13	207–236	14–67	**237**–257	68–93	258–350	94–99
Spring								
2	100–174	1–13	175–193	14–62	**194**–212	63–95	213–350	96–99
3	100–187	1–17	188–204	18–60	**205**–222	61–93	223–350	94–99
4	100–197	1–20	198–216	21–65	**217**–235	66–94	236–350	95–99
5	100–199	1–12	200–226	13–68	**227**–248	69–95	249–350	96–99
6	100–204	1–14	205–227	15–61	**228**–251	62–94	252–350	95–99
7	100–207	1–15	208–234	16–66	**235**–256	67–94	257–350	95–99
8	100–208	1–13	209–238	14–66	**239**–259	67–92	260–350	93–99

*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 3.5 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 MCAS tests, providing insight into the predictive validity of MAP Growth. The overall classification accuracy rate ranges from 0.80 to 0.83 for ELA/Reading and 0.80 to 0.90 for Mathematics. These values suggest that the RIT cut scores are good at classifying students as proficient or not proficient on the MCAS assessment. For Grade 2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on MCAS 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 MCAS tests, there is a notable limitation to how these results should be used and interpreted. MCAS and MAP Growth assessments are designed for different purposes and measure slightly different constructs even within the same content area. Therefore, scores on the two tests cannot be assumed to be interchangeable. MAP Growth may not be used as a substitute for the state tests and vice versa.

Table 3.5. Classification Accuracy Results

Grade	N	Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	Precision	AUC*
		MAP Growth	MCAS		FP	FN				
ELA/Reading										
2	1,370	193	500	0.80	0.16	0.30	0.70	0.84	0.67	0.86
3	2,389	203	500	0.81	0.16	0.25	0.75	0.84	0.71	0.88
4	2,650	211	500	0.81	0.16	0.23	0.77	0.84	0.75	0.89
5	2,516	216	500	0.82	0.16	0.20	0.80	0.84	0.75	0.89
6	2,045	221	500	0.83	0.12	0.26	0.74	0.88	0.76	0.90
7	1,414	223	500	0.83	0.13	0.24	0.76	0.87	0.76	0.90
8	1,218	226	500	0.81	0.14	0.30	0.70	0.86	0.72	0.89
Mathematics										
2	1,484	194	500	0.80	0.11	0.36	0.64	0.89	0.78	0.87
3	2,649	205	500	0.83	0.16	0.17	0.83	0.84	0.74	0.92
4	2,858	217	500	0.85	0.15	0.16	0.84	0.85	0.79	0.93
5	2,835	227	500	0.87	0.12	0.16	0.84	0.88	0.78	0.94
6	2,436	228	500	0.87	0.13	0.13	0.87	0.87	0.78	0.95
7	1,381	235	500	0.90	0.11	0.10	0.90	0.89	0.80	0.97
8	1,172	239	500	0.88	0.10	0.20	0.80	0.90	0.77	0.93

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

3.5. Proficiency Projection

Table 3.6 and Table 3.7 present the estimated probability of achieving *Meeting Expectations* performance on the MCAS test based on RIT scores from fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 204 in the fall has an 89% chance of reaching *Meeting Expectations* proficiency or higher on the MCAS test. "Prob." indicates the probability of obtaining proficient status on the MCAS test in the spring.

Table 3.6. 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	
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.
2	5	193	147	No	<0.01	156	No	<0.01	160	No	<0.01
	10	193	153	No	<0.01	162	No	<0.01	166	No	<0.01
	15	193	157	No	<0.01	166	No	<0.01	170	No	<0.01
	20	193	160	No	0.01	169	No	<0.01	173	No	<0.01
	25	193	162	No	0.01	171	No	<0.01	175	No	<0.01
	30	193	164	No	0.02	173	No	<0.01	177	No	<0.01
	35	193	166	No	0.04	175	No	0.01	180	No	<0.01
	40	193	168	No	0.07	177	No	0.02	182	No	<0.01
	45	193	170	No	0.09	179	No	0.03	184	No	<0.01
	50	193	172	No	0.15	181	No	0.07	186	No	0.01
	55	193	174	No	0.21	183	No	0.13	188	No	0.06
	60	193	176	No	0.30	185	No	0.23	189	No	0.11
	65	193	178	No	0.40	187	No	0.35	192	No	0.38
	70	193	180	No	0.45	189	Yes	0.50	194	Yes	0.62
	75	193	183	Yes	0.60	191	Yes	0.65	196	Yes	0.83
	80	193	185	Yes	0.70	194	Yes	0.83	199	Yes	0.97
	85	193	188	Yes	0.79	197	Yes	0.93	202	Yes	>0.99
	90	193	192	Yes	0.91	200	Yes	0.98	205	Yes	>0.99
	95	193	197	Yes	0.97	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		
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.	
3	5	203	159	No	<0.01	167	No	<0.01	170	No	<0.01	
	10	203	165	No	<0.01	173	No	<0.01	176	No	<0.01	
	15	203	169	No	<0.01	177	No	<0.01	180	No	<0.01	
	20	203	173	No	0.01	180	No	<0.01	183	No	<0.01	
	25	203	175	No	0.02	183	No	<0.01	186	No	<0.01	
	30	203	178	No	0.04	185	No	<0.01	189	No	<0.01	
	35	203	180	No	0.05	188	No	0.02	191	No	<0.01	
	40	203	182	No	0.09	190	No	0.03	193	No	<0.01	
	45	203	185	No	0.17	192	No	0.07	195	No	0.01	
	50	203	187	No	0.21	194	No	0.13	197	No	0.03	
	55	203	189	No	0.30	196	No	0.23	199	No	0.11	
	60	203	191	No	0.39	198	No	0.35	201	No	0.27	
	65	203	193	Yes	0.50	200	Yes	0.50	203	Yes	0.50	
	70	203	195	Yes	0.55	202	Yes	0.65	206	Yes	0.83	
	75	203	198	Yes	0.70	205	Yes	0.83	208	Yes	0.94	
	80	203	201	Yes	0.83	207	Yes	0.91	211	Yes	0.99	
	85	203	204	Yes	0.89	211	Yes	0.97	214	Yes	>0.99	
	90	203	208	Yes	0.96	215	Yes	>0.99	218	Yes	>0.99	
	95	203	214	Yes	0.99	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			
	Start	Spring	Fall	Projected Proficiency		Winter	Projected Proficiency		Spring	Projected Proficiency		
Grade	%ile	Cut	RIT	*Meeting*	Prob.	RIT	*Meeting*	Prob.	RIT	*Meeting*	Prob.	
5	5	216	178	No	<0.01	183	No	<0.01	185	No	<0.01	
	10	216	183	No	<0.01	189	No	<0.01	191	No	<0.01	
	15	216	187	No	<0.01	193	No	<0.01	194	No	<0.01	
	20	216	191	No	0.01	196	No	<0.01	198	No	<0.01	
	25	216	193	No	0.02	198	No	<0.01	200	No	<0.01	
	30	216	196	No	0.05	201	No	0.01	203	No	<0.01	
	35	216	198	No	0.06	203	No	0.02	205	No	<0.01	
	40	216	200	No	0.11	205	No	0.04	207	No	<0.01	
	45	216	202	No	0.17	207	No	0.09	209	No	0.01	
	50	216	204	No	0.24	209	No	0.17	211	No	0.06	
	55	216	207	No	0.34	211	No	0.28	213	No	0.17	
	60	216	209	No	0.44	213	No	0.42	215	No	0.38	
	65	216	211	Yes	0.56	215	Yes	0.58	217	Yes	0.62	
	70	216	213	Yes	0.61	217	Yes	0.65	219	Yes	0.83	
	75	216	216	Yes	0.76	220	Yes	0.83	222	Yes	0.97	
	80	216	218	Yes	0.83	222	Yes	0.91	224	Yes	0.99	
	85	216	221	Yes	0.89	226	Yes	0.98	228	Yes	>0.99	
	90	216	225	Yes	0.96	229	Yes	>0.99	231	Yes	>0.99	
	95	216	231	Yes	0.99	235	Yes	>0.99	237	Yes	>0.99	
6	5	221	183	No	<0.01	188	No	<0.01	189	No	<0.01	
	10	221	189	No	<0.01	193	No	<0.01	195	No	<0.01	
	15	221	193	No	<0.01	197	No	<0.01	199	No	<0.01	
	20	221	196	No	<0.01	200	No	<0.01	202	No	<0.01	
	25	221	199	No	0.02	203	No	<0.01	205	No	<0.01	
	30	221	202	No	0.03	205	No	<0.01	207	No	<0.01	
	35	221	204	No	0.06	208	No	0.02	209	No	<0.01	
	40	221	206	No	0.10	210	No	0.04	211	No	<0.01	
	45	221	208	No	0.13	212	No	0.09	213	No	0.01	
	50	221	210	No	0.19	214	No	0.17	215	No	0.03	
	55	221	212	No	0.28	216	No	0.22	217	No	0.11	
	60	221	214	No	0.39	218	No	0.35	219	No	0.27	
	65	221	217	Yes	0.50	220	Yes	0.50	222	Yes	0.62	
	70	221	219	Yes	0.61	222	Yes	0.65	224	Yes	0.83	
	75	221	221	Yes	0.72	225	Yes	0.83	226	Yes	0.94	
	80	221	224	Yes	0.81	227	Yes	0.91	229	Yes	0.99	
	85	221	227	Yes	0.90	230	Yes	0.97	232	Yes	>0.99	
	90	221	231	Yes	0.97	234	Yes	>0.99	236	Yes	>0.99	
	95	221	237	Yes	>0.99	240	Yes	>0.99	242	Yes	>0.99	

ELA/Reading												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.	
7	5	223	187	No	<0.01	190	No	<0.01	191	No	<0.01	
	10	223	193	No	<0.01	196	No	<0.01	197	No	<0.01	
	15	223	197	No	<0.01	200	No	<0.01	201	No	<0.01	
	20	223	200	No	0.01	203	No	<0.01	205	No	<0.01	
	25	223	203	No	0.02	206	No	<0.01	207	No	<0.01	
	30	223	206	No	0.04	209	No	0.01	210	No	<0.01	
	35	223	208	No	0.08	211	No	0.03	212	No	<0.01	
	40	223	210	No	0.12	213	No	0.04	214	No	<0.01	
	45	223	212	No	0.16	215	No	0.09	216	No	0.01	
	50	223	214	No	0.24	217	No	0.17	218	No	0.06	
	55	223	216	No	0.33	219	No	0.28	220	No	0.17	
	60	223	218	No	0.44	221	No	0.42	223	Yes	0.50	
	65	223	221	Yes	0.56	223	Yes	0.58	225	Yes	0.73	
	70	223	223	Yes	0.67	226	Yes	0.78	227	Yes	0.89	
	75	223	225	Yes	0.76	228	Yes	0.88	229	Yes	0.97	
	80	223	228	Yes	0.88	231	Yes	0.96	232	Yes	>0.99	
	85	223	231	Yes	0.92	234	Yes	0.99	235	Yes	>0.99	
	90	223	235	Yes	0.98	238	Yes	>0.99	239	Yes	>0.99	
	95	223	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99	
8	5	226	190	No	<0.01	193	No	<0.01	194	No	<0.01	
	10	226	196	No	<0.01	199	No	<0.01	200	No	<0.01	
	15	226	200	No	<0.01	203	No	<0.01	204	No	<0.01	
	20	226	204	No	0.01	206	No	<0.01	207	No	<0.01	
	25	226	207	No	0.03	209	No	<0.01	210	No	<0.01	
	30	226	209	No	0.05	212	No	0.01	213	No	<0.01	
	35	226	211	No	0.06	214	No	0.02	215	No	<0.01	
	40	226	214	No	0.13	216	No	0.04	217	No	<0.01	
	45	226	216	No	0.20	218	No	0.09	220	No	0.03	
	50	226	218	No	0.29	221	No	0.22	222	No	0.11	
	55	226	220	No	0.34	223	No	0.35	224	No	0.27	
	60	226	222	No	0.45	225	Yes	0.50	226	Yes	0.50	
	65	226	225	Yes	0.61	227	Yes	0.65	228	Yes	0.73	
	70	226	227	Yes	0.71	229	Yes	0.78	231	Yes	0.94	
	75	226	230	Yes	0.80	232	Yes	0.91	233	Yes	0.99	
	80	226	232	Yes	0.87	235	Yes	0.97	236	Yes	>0.99	
	85	226	236	Yes	0.95	238	Yes	0.99	239	Yes	>0.99	
	90	226	240	Yes	0.99	242	Yes	>0.99	243	Yes	>0.99	
	95	226	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

Table 3.7. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
			Fall			Winter			Spring		
				Projected Proficiency			Projected Proficiency			Projected Proficiency	
Grade	Start %ile	Spring Cut	Fall RIT	*Meeting*	Prob.	Winter RIT	*Meeting*	Prob.	Spring RIT	*Meeting*	Prob.
2	5	194	154	No	<0.01	163	No	<0.01	167	No	<0.01
	10	194	158	No	<0.01	167	No	<0.01	172	No	<0.01
	15	194	162	No	0.01	171	No	<0.01	175	No	<0.01
	20	194	164	No	0.01	173	No	<0.01	178	No	<0.01
	25	194	166	No	0.02	175	No	<0.01	180	No	<0.01
	30	194	168	No	0.04	177	No	0.01	182	No	<0.01
	35	194	170	No	0.08	179	No	0.03	184	No	<0.01
	40	194	172	No	0.14	181	No	0.05	186	No	<0.01
	45	194	173	No	0.18	182	No	0.07	188	No	0.02
	50	194	175	No	0.22	184	No	0.15	189	No	0.04
	55	194	177	No	0.32	186	No	0.26	191	No	0.15
	60	194	178	No	0.38	187	No	0.34	193	No	0.37
	65	194	180	Yes	0.50	189	Yes	0.50	195	Yes	0.63
	70	194	182	Yes	0.62	191	Yes	0.66	196	Yes	0.75
	75	194	184	Yes	0.73	193	Yes	0.80	198	Yes	0.92
	80	194	186	Yes	0.78	195	Yes	0.90	201	Yes	0.99
	85	194	188	Yes	0.86	198	Yes	0.97	203	Yes	>0.99
	90	194	192	Yes	0.96	201	Yes	0.99	207	Yes	>0.99
	95	194	196	Yes	0.99	205	Yes	>0.99	212	Yes	>0.99
3	5	205	166	No	<0.01	174	No	<0.01	178	No	<0.01
	10	205	171	No	<0.01	179	No	<0.01	183	No	<0.01
	15	205	175	No	<0.01	182	No	<0.01	186	No	<0.01
	20	205	177	No	0.01	185	No	<0.01	189	No	<0.01
	25	205	179	No	0.02	187	No	<0.01	192	No	<0.01
	30	205	181	No	0.04	189	No	0.01	194	No	<0.01
	35	205	183	No	0.07	191	No	0.03	196	No	<0.01
	40	205	185	No	0.13	193	No	0.07	198	No	0.01
	45	205	187	No	0.21	195	No	0.14	199	No	0.02
	50	205	188	No	0.26	196	No	0.20	201	No	0.08
	55	205	190	No	0.37	198	No	0.33	203	No	0.25
	60	205	192	No	0.44	200	Yes	0.50	205	Yes	0.50
	65	205	194	Yes	0.56	201	Yes	0.58	207	Yes	0.75
	70	205	196	Yes	0.69	203	Yes	0.74	208	Yes	0.85
	75	205	198	Yes	0.79	205	Yes	0.86	211	Yes	0.98
	80	205	200	Yes	0.87	208	Yes	0.96	213	Yes	>0.99
	85	205	202	Yes	0.93	210	Yes	0.98	216	Yes	>0.99
	90	205	206	Yes	0.98	214	Yes	>0.99	219	Yes	>0.99
	95	205	211	Yes	>0.99	219	Yes	>0.99	224	Yes	>0.99

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.	
4	5	217	176	No	<0.01	182	No	<0.01	185	No	<0.01	
	10	217	181	No	<0.01	187	No	<0.01	191	No	<0.01	
	15	217	185	No	<0.01	191	No	<0.01	194	No	<0.01	
	20	217	187	No	<0.01	194	No	<0.01	197	No	<0.01	
	25	217	190	No	0.01	196	No	<0.01	200	No	<0.01	
	30	217	192	No	0.01	198	No	<0.01	202	No	<0.01	
	35	217	194	No	0.03	200	No	<0.01	205	No	<0.01	
	40	217	196	No	0.05	202	No	0.01	207	No	<0.01	
	45	217	198	No	0.10	204	No	0.03	209	No	<0.01	
	50	217	200	No	0.17	206	No	0.07	211	No	0.02	
	55	217	201	No	0.21	208	No	0.14	212	No	0.04	
	60	217	203	No	0.32	210	No	0.26	214	No	0.15	
	65	217	205	No	0.44	212	No	0.42	217	Yes	0.50	
	70	217	207	Yes	0.56	214	Yes	0.58	219	Yes	0.75	
	75	217	209	Yes	0.68	216	Yes	0.74	221	Yes	0.92	
	80	217	212	Yes	0.83	219	Yes	0.90	224	Yes	0.99	
	85	217	214	Yes	0.90	221	Yes	0.96	227	Yes	>0.99	
	90	217	218	Yes	0.97	225	Yes	0.99	230	Yes	>0.99	
	95	217	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	
5	5	227	184	No	<0.01	189	No	<0.01	191	No	<0.01	
	10	227	190	No	<0.01	194	No	<0.01	197	No	<0.01	
	15	227	193	No	<0.01	198	No	<0.01	201	No	<0.01	
	20	227	196	No	<0.01	201	No	<0.01	205	No	<0.01	
	25	227	199	No	<0.01	204	No	<0.01	207	No	<0.01	
	30	227	201	No	0.01	206	No	<0.01	210	No	<0.01	
	35	227	203	No	0.02	209	No	<0.01	212	No	<0.01	
	40	227	205	No	0.03	211	No	0.01	215	No	<0.01	
	45	227	207	No	0.06	213	No	0.02	217	No	<0.01	
	50	227	209	No	0.11	215	No	0.05	219	No	<0.01	
	55	227	211	No	0.18	217	No	0.10	221	No	0.02	
	60	227	213	No	0.27	219	No	0.20	223	No	0.08	
	65	227	215	No	0.38	221	No	0.34	225	No	0.25	
	70	227	217	Yes	0.50	223	Yes	0.50	228	Yes	0.63	
	75	227	219	Yes	0.62	225	Yes	0.66	230	Yes	0.85	
	80	227	222	Yes	0.78	228	Yes	0.85	233	Yes	0.98	
	85	227	225	Yes	0.89	231	Yes	0.95	236	Yes	>0.99	
	90	227	229	Yes	0.97	235	Yes	0.99	240	Yes	>0.99	
	95	227	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		
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.	
6	5	228	188	No	<0.01	192	No	<0.01	194	No	<0.01	
	10	228	194	No	<0.01	198	No	<0.01	200	No	<0.01	
	15	228	198	No	<0.01	202	No	<0.01	205	No	<0.01	
	20	228	201	No	<0.01	205	No	<0.01	208	No	<0.01	
	25	228	204	No	0.01	208	No	<0.01	211	No	<0.01	
	30	228	206	No	0.01	211	No	<0.01	214	No	<0.01	
	35	228	209	No	0.04	213	No	0.01	216	No	<0.01	
	40	228	211	No	0.08	215	No	0.02	218	No	<0.01	
	45	228	213	No	0.14	217	No	0.04	221	No	0.01	
	50	228	215	No	0.22	220	No	0.14	223	No	0.04	
	55	228	217	No	0.32	222	No	0.26	225	No	0.15	
	60	228	219	No	0.44	224	No	0.42	227	No	0.37	
	65	228	221	Yes	0.56	226	Yes	0.58	230	Yes	0.75	
	70	228	223	Yes	0.68	228	Yes	0.74	232	Yes	0.92	
	75	228	226	Yes	0.83	231	Yes	0.90	235	Yes	0.99	
	80	228	228	Yes	0.90	234	Yes	0.97	238	Yes	>0.99	
	85	228	231	Yes	0.96	237	Yes	0.99	241	Yes	>0.99	
	90	228	235	Yes	0.99	241	Yes	>0.99	245	Yes	>0.99	
	95	228	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	
7	5	235	192	No	<0.01	194	No	<0.01	196	No	<0.01	
	10	235	198	No	<0.01	201	No	<0.01	203	No	<0.01	
	15	235	202	No	<0.01	205	No	<0.01	207	No	<0.01	
	20	235	206	No	<0.01	209	No	<0.01	211	No	<0.01	
	25	235	208	No	<0.01	212	No	<0.01	214	No	<0.01	
	30	235	211	No	<0.01	215	No	<0.01	217	No	<0.01	
	35	235	213	No	<0.01	217	No	<0.01	220	No	<0.01	
	40	235	216	No	0.02	219	No	<0.01	222	No	<0.01	
	45	235	218	No	0.05	222	No	0.02	224	No	<0.01	
	50	235	220	No	0.10	224	No	0.04	227	No	<0.01	
	55	235	222	No	0.17	226	No	0.10	229	No	0.02	
	60	235	225	No	0.31	229	No	0.26	231	No	0.08	
	65	235	227	No	0.44	231	No	0.42	234	No	0.37	
	70	235	229	Yes	0.56	233	Yes	0.58	236	Yes	0.63	
	75	235	232	Yes	0.74	236	Yes	0.80	239	Yes	0.92	
	80	235	235	Yes	0.87	239	Yes	0.93	242	Yes	0.99	
	85	235	238	Yes	0.95	243	Yes	0.99	246	Yes	>0.99	
	90	235	243	Yes	0.99	247	Yes	>0.99	251	Yes	>0.99	
	95	235	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	

Mathematics												
			Fall			Winter			Spring			
Grade	Start %ile	Spring Cut	Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency		
				Meeting	Prob.		*Meeting*	Prob.		*Meeting*	Prob.	
8	5	239	194	No	<0.01	196	No	<0.01	197	No	<0.01	
	10	239	201	No	<0.01	203	No	<0.01	205	No	<0.01	
	15	239	205	No	<0.01	208	No	<0.01	210	No	<0.01	
	20	239	209	No	<0.01	212	No	<0.01	214	No	<0.01	
	25	239	212	No	<0.01	215	No	<0.01	217	No	<0.01	
	30	239	215	No	<0.01	218	No	<0.01	220	No	<0.01	
	35	239	218	No	0.01	221	No	<0.01	223	No	<0.01	
	40	239	220	No	0.02	223	No	<0.01	225	No	<0.01	
	45	239	223	No	0.06	226	No	0.01	228	No	<0.01	
	50	239	225	No	0.10	228	No	0.03	230	No	<0.01	
	55	239	227	No	0.16	231	No	0.11	233	No	0.02	
	60	239	230	No	0.28	233	No	0.20	235	No	0.08	
	65	239	232	No	0.39	236	No	0.42	238	No	0.37	
	70	239	235	Yes	0.56	238	Yes	0.58	241	Yes	0.75	
	75	239	238	Yes	0.72	241	Yes	0.80	244	Yes	0.96	
	80	239	241	Yes	0.84	244	Yes	0.93	247	Yes	>0.99	
	85	239	245	Yes	0.94	248	Yes	0.99	251	Yes	>0.99	
	90	239	249	Yes	0.98	253	Yes	>0.99	256	Yes	>0.99	
	95	239	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99	

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