

Linking Study Report: Predicting Performance on the Kentucky Performance Rating for Educational Progress (K-PREP) based on NWEA MAP Growth Scores

July 2020

NWEA Psychometric Solutions



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Executive Summary

To predict student achievement on the Kentucky Performance Rating for Educational Progress (K-PREP) assessments in Grades 3–8 Reading and Mathematics, NWEA® conducted a linking study using Spring 2014 data to derive Rasch Unit (RIT) cut scores on the MAP® Growth™ assessments that correspond to the K-PREP performance levels. With this information, educators can identify students at risk of failing to meet state proficiency standards early in the year and provide tailored educational interventions. The linking study has been updated since the previous version published in February 2016 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020).

Table E.1 presents the K-PREP *Proficient* performance level cut scores and the corresponding MAP Growth RIT cut scores that allow teachers to identify students who are on track for proficiency on the state summative test and those who are not. For example, the *Proficient* cut score on the K-PREP Grade 3 Reading test is 210. A Grade 3 student with a MAP Growth Reading RIT score of 191 in the fall is likely to meet proficiency on the K-PREP Reading test in the spring, whereas a Grade 3 student with a MAP Growth Reading RIT score lower than 191 in the fall is in jeopardy of not meeting proficiency.

Table E.1. MAP Growth Cut Scores for K-PREP Proficiency

Assessment		Proficient Cut Scores by Grade					
		3	4	5	6	7	8
Reading							
K-PREP Spring		210	210	210	210	210	210
MAP Growth	Fall	191	201	208	212	216	221
	Winter	198	207	212	216	219	223
	Spring	201	209	214	217	220	224
Mathematics							
K-PREP Spring		210	210	210	210	210	210
MAP Growth	Fall	193	203	212	217	224	231
	Winter	200	210	218	222	228	234
	Spring	205	214	222	225	231	236

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 K-PREP Grades 3–8 Reading and Mathematics summative tests are aligned to the Kentucky Academic Standards (KAS). Based on their test scores, students are placed into one of four performance levels: *Novice*, *Apprentice*, *Proficient*, and *Distinguished*. These tests are used to provide evidence of student achievement in Reading and Mathematics as part of the state’s accountability program. The *Proficient* 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 2014 test administration, the equipercentile linking method was used to identify the spring MAP Growth scores that correspond to the spring K-PREP performance level cut scores. MAP Growth fall and winter cut scores that predict proficiency on the spring K-PREP 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 K-PREP assessments in Spring 2014 were included in the study sample. Table E.2 presents the number of Kentucky students from 27 districts who were included in the linking study.

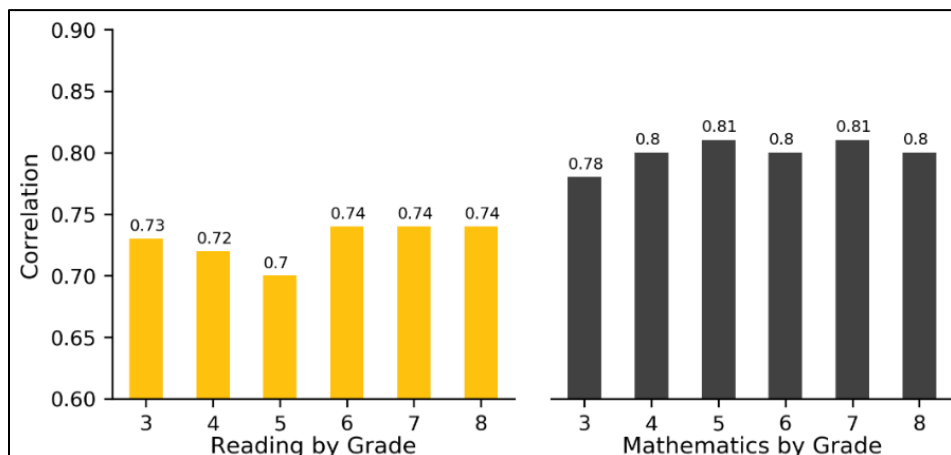
Table E.2. Linking Study Sample

Grade	#Students	
	Reading	Mathematics
3	9,619	9,635
4	10,165	10,164
5	10,013	10,011
6	10,440	10,449
7	10,283	10,312
8	10,038	10,004

E.4. Test Score Relationships

Correlations between MAP Growth scores and K-PREP scores range from 0.70 to 0.81 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 K-PREP assessments.

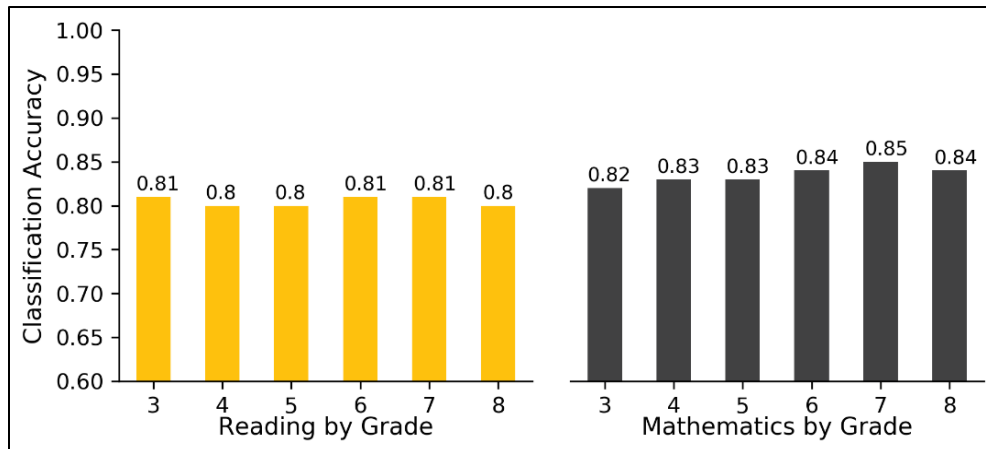
Figure E.1. Correlations between MAP Growth and K-PREP Tests



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 K-PREP tests. For example, the MAP Growth Reading Grade 3 *Proficient* 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 0.80 to 0.85 across both content areas, indicating that RIT scores have a high accuracy rate of identifying student proficiency on the K-PREP 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 Kentucky Performance Rating of Educational Progress (K-PREP) assessments in Grades 3–8 Reading and Mathematics with Rasch Unit (RIT) scores from the MAP Growth assessments taken during the Spring 2014 term. The linking study has been updated since the previous version published in February 2016 to incorporate the new 2020 NWEA MAP Growth norms (Thum & Kuhfeld, 2020). This report presents the following results:

1. Student sample demographics
2. Descriptive statistics of test scores
3. MAP Growth RIT cut scores that correspond to the K-PREP performance 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 K-PREP tests
5. The probability of achieving grade-level proficiency on the K-PREP assessment based on MAP Growth RIT scores from fall, winter, and spring using the 2020 norms

1.2. Assessment Overview

The K-PREP Grades 3–8 Reading and Mathematics summative assessments are aligned to the Kentucky Academic Standards (KAS). Each assessment has three cut scores (i.e., the minimum score a student must get on a test to be placed in a certain performance level) that distinguish between the following performance levels: *Novice*, *Apprentice*, *Proficient*, and *Distinguished*. The *Proficient* 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 2014 administrations of the MAP Growth and K-PREP assessments. NWEA recruited Kentucky 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 Kentucky 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 K-PREP assessments in Spring 2014 were included in the study sample.

2.2. MAP Growth Cut Scores

The equipercentile procedure (Kolen & Brennan, 2004) was used to identify the spring MAP Growth RIT scores that correspond to the spring K-PREP performance level cut scores. MAP Growth fall and winter cut scores that predict proficiency on the spring K-PREP 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 information for understanding (1) how student scores compare to peers nationwide and (2) the relative rigor of a state's performance level designations for its summative assessment.

The MAP Growth spring cut scores could be calculated using the equipercentile linking method because that data are directly connected to the K-PREP 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., K-PREP). 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 K-PREP on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on K-PREP, 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. Equation 2 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:

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

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.

2.3. Classification Accuracy

The degree to which MAP Growth predicts student proficiency status on the K-PREP tests can be described using classification accuracy statistics based on the MAP Growth spring RIT cut scores that show the proportion of students correctly classified by their RIT scores as proficient (*Proficient* or *Distinguished*) or not proficient (*Novice* or *Apprentice*). Table 2.1 describes the classification accuracy statistics provided in this report (Pommerich, Hanson, Harris, & Scoring, 2004). The results are based on the Spring 2014 MAP Growth and K-PREP data for the *Proficient* cut score.

Table 2.1. Descriptions of Classification Accuracy Summary Statistics

Statistic	Description*	Interpretation
Overall Classification Accuracy Rate	$(TP + TN) / (\text{total sample size})$	Proportion of the study sample whose proficiency classification on the state test was correctly predicted by MAP Growth cut scores
False Negative (FN) Rate	$FN / (FN + TP)$	Proportion of 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
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 K-PREP 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 *Proficient* on the K-PREP test based on their fall or winter RIT score:

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

where:

- Φ is a standardized normal cumulative distribution.
- $RIT_{previous}$ is the student's RIT score in fall or winter.
- 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.
- SD is the conditional standard deviation of the expected growth, g .

Equation 4 was used to estimate the probability of a student achieving *Proficient* on the K-PREP test based on their spring score (RIT_{Spring}):

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

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 K-PREP assessments in Spring 2014 were included in the study sample. Data used in this study were collected from 27 districts in Kentucky.

3.2. Descriptive Statistics

Table 3.1 presents descriptive statistics of the MAP Growth and K-PREP test scores from Spring 2014, including the correlation coefficient (r) between them. The correlation coefficients between the scores range from 0.70 to 0.74 for Reading and 0.78 to 0.81 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 K-PREP assessments.

Table 3.1. Descriptive Statistics of Test Scores

Grade	N	r	K-PREP*				MAP Growth*			
			Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
Reading										
3	9,619	0.73	211.3	18.7	100	287	200.2	14.5	140	250
4	10,165	0.72	210.7	16.7	100	297	207.7	13.9	140	247
5	10,013	0.70	211.1	15.1	100	262	213.6	13.8	145	254
6	10,440	0.74	210.7	15.7	108	274	216.0	13.9	147	258
7	10,283	0.74	212.0	15.1	100	300	220.1	13.7	146	259
8	10,038	0.74	210.6	13.7	100	258	224.1	13.5	152	269
Mathematics										
3	9,635	0.78	210.0	20.1	100	300	203.7	12.5	141	255
4	10,164	0.80	210.3	17.7	156	300	212.5	13.3	142	268
5	10,011	0.81	210.7	17.6	100	300	220.8	15.4	136	275
6	10,449	0.80	209.3	17.9	109	300	222.1	14.5	149	274
7	10,312	0.81	208.4	17.6	100	300	227.8	15.4	151	279
8	10,004	0.80	209.0	16.3	100	300	233.1	15.7	143	296

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

3.3. MAP Growth Cut Score Predictions

Table 3.2 and Table 3.3 present the K-PREP scale score ranges and the corresponding MAP Growth RIT cut scores and percentile ranges by content area and grade. These tables can be used to predict a student's likely performance level on the K-PREP 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 191 in the fall is likely to reach *Proficient* on the K-PREP Reading test. A Grade 3 student who obtained a MAP Growth Reading RIT score of 201 in the spring is also likely to reach *Proficient* on the K-PREP test. 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 performance level could be different from the generic projection presented in this document. Partners are therefore encouraged to use the projected performance level in students’ profile, classroom, and grade reports in the NWEA reporting system since they reflect the specific instructional weeks set by partners.

Table 3.2. MAP Growth Cut Scores—Reading

K-PREP Reading*								
Grade	Novice		Apprentice		Proficient		Distinguished	
3	100–197		198–209		210–225		226–300	
4	100–196		197–209		210–226		227–300	
5	100–197		198–209		210–225		226–300	
6	100–198		199–209		210–226		227–300	
7	100–198		199–209		210–225		226–300	
8	100–198		199–209		210–224		225–300	
MAP Growth Reading*								
Grade	Novice		Apprentice		Proficient		Distinguished	
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile
Fall								
3	100–180	1–35	181–190	36–59	191–203	60–84	204–350	85–99
4	100–188	1–31	189–200	32–59	201–214	60–85	215–350	86–99
5	100–194	1–27	195–207	28–57	208–221	58–85	222–350	86–99
6	100–201	1–29	202–211	30–53	212–225	54–82	226–350	83–99
7	100–204	1–27	205–215	28–53	216–228	54–80	229–350	81–99
8	100–208	1–28	209–220	29–55	221–235	56–84	236–350	85–99
Winter								
3	100–187	1–34	188–197	35–58	198–208	59–81	209–350	82–99
4	100–194	1–31	195–206	32–59	207–218	60–83	219–350	84–99
5	100–200	1–29	201–211	30–55	212–224	56–83	225–350	84–99
6	100–205	1–30	206–215	31–54	216–227	55–80	228–350	81–99
7	100–207	1–27	208–218	28–53	219–230	54–79	231–350	80–99
8	100–212	1–31	213–222	32–54	223–236	55–83	237–350	84–99
Spring								
3	100–191	1–36	192–200	37–58	201–211	59–81	212–350	82–99
4	100–197	1–32	198–208	33–58	209–220	59–83	221–350	84–99
5	100–202	1–29	203–213	30–56	214–225	57–81	226–350	82–99
6	100–207	1–31	208–216	32–52	217–228	53–79	229–350	80–99
7	100–209	1–29	210–219	30–52	220–231	53–78	232–350	79–99
8	100–213	1–31	214–223	32–54	224–237	55–82	238–350	83–99

*Cut scores for fall and winter are derived from the spring cuts and growth scores based on the typical instructional weeks. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

Table 3.3. MAP Growth Cut Scores—Mathematics

K-PREP Mathematics*									
Grade	Novice		Apprentice		Proficient		Distinguished		
3	100–191		192–209		210–233		234–300		
4	100–193		194–209		210–228		229–300		
5	100–191		192–209		210–228		229–300		
6	100–190		191–209		210–230		231–300		
7	100–191		192–209		210–230		231–300		
8	100–191		192–209		210–231		232–300		
MAP Growth Mathematics*									
Grade	Novice		Apprentice		Proficient		Distinguished		
	RIT	Percentile	RIT	Percentile	RIT	Percentile	RIT	Percentile	
Fall									
3	100–179	1–25	180–192	26–61	193–205	62–89	206–350	90–99	
4	100–188	1–22	189–202	23–58	203–215	59–86	216–350	87–99	
5	100–194	1–16	195–211	17–56	212–226	57–87	227–350	88–99	
6	100–198	1–15	199–216	16–54	217–230	55–83	231–350	84–99	
7	100–207	1–23	208–223	24–57	224–239	58–86	240–350	87–99	
8	100–210	1–22	211–230	23–61	231–248	62–89	249–350	90–99	
Winter									
3	100–187	1–26	188–199	27–59	200–213	60–89	214–350	90–99	
4	100–194	1–21	195–209	22–59	210–222	60–86	223–350	87–99	
5	100–199	1–16	200–217	17–57	218–232	58–86	233–350	87–99	
6	100–203	1–16	204–221	17–54	222–235	55–82	236–350	83–99	
7	100–210	1–22	211–227	23–57	228–243	58–86	244–350	87–99	
8	100–214	1–24	215–233	25–60	234–251	61–88	252–350	89–99	
Spring									
3	100–192	1–27	193–204	28–59	205–217	60–87	218–350	88–99	
4	100–199	1–23	200–213	24–57	214–226	58–84	227–350	85–99	
5	100–203	1–18	204–221	19–56	222–236	57–85	237–350	86–99	
6	100–206	1–17	207–224	18–53	225–238	54–81	239–350	82–99	
7	100–213	1–23	214–230	24–58	231–246	59–85	247–350	86–99	
8	100–216	1–24	217–235	25–60	236–253	61–87	254–350	88–99	

*Cut scores for fall and winter are derived from the spring cuts and growth scores based on the typical instructional weeks. Bolded numbers indicate the cut scores considered to be at least proficient for accountability purposes.

3.4. Classification Accuracy

Table 3.4 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 K-PREP tests, providing insight into the predictive validity of MAP Growth tests. The overall classification accuracy rate ranges from 0.80 to 0.81 for Reading and 0.82 to 0.85 for Mathematics. These values suggest that the RIT cut scores are good at classifying students as *Proficient* on the K-PREP assessment.

Although the results show that MAP Growth scores can be used to accurately classify students as likely to be proficient on the K-PREP tests, there is a notable limitation to how these results should be used and interpreted. K-PREP tests 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 3.4. Classification Accuracy Results

Grade	N	Cut Score		Class. Accuracy*	Rate*		Sensitivity	Specificity	AUC*
		MAP Growth	K-PREP		FP	FN			
Reading									
3	9,619	201	210	0.81	0.22	0.17	0.83	0.78	0.88
4	10,165	209	210	0.80	0.20	0.20	0.80	0.80	0.88
5	10,013	214	210	0.80	0.23	0.19	0.81	0.77	0.87
6	10,440	217	210	0.81	0.22	0.17	0.83	0.78	0.89
7	10,283	220	210	0.81	0.22	0.17	0.83	0.78	0.89
8	10,038	224	210	0.80	0.24	0.17	0.83	0.76	0.88
Mathematics									
3	9,635	205	210	0.82	0.18	0.18	0.82	0.82	0.90
4	10,164	214	210	0.83	0.16	0.18	0.82	0.84	0.91
5	10,011	222	210	0.83	0.15	0.18	0.82	0.85	0.91
6	10,449	225	210	0.84	0.15	0.18	0.82	0.85	0.92
7	10,312	231	210	0.85	0.14	0.15	0.85	0.86	0.93
8	10,004	236	210	0.84	0.15	0.18	0.82	0.85	0.91

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

3.5. Proficiency Projection

Table 3.5 and Table 3.6 present the estimated probability of achieving the *Proficient* performance level on the K-PREP test based on RIT scores from fall, winter, or spring. For example, a Grade 3 student who obtained a MAP Growth Reading score of 201 in the fall has an 89% chance of reaching proficiency or higher on the K-PREP test. “Prob.” Indicates the probability of obtaining proficient status on the K-PREP test in the spring.

Table 3.5. Proficiency Projection based on RIT Scores—Reading

Reading											
Grade	Start %ile	Spring Cut	Fall		Winter			Spring			
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
3	5	201	159	No	<0.01	167	No	<0.01	170	No	<0.01
	10	201	165	No	<0.01	173	No	<0.01	176	No	<0.01
	15	201	169	No	0.01	177	No	<0.01	180	No	<0.01
	20	201	173	No	0.02	180	No	<0.01	183	No	<0.01
	25	201	175	No	0.03	183	No	<0.01	186	No	<0.01
	30	201	178	No	0.07	185	No	0.01	189	No	<0.01
	35	201	180	No	0.09	188	No	0.05	191	No	<0.01
	40	201	182	No	0.14	190	No	0.07	193	No	0.01
	45	201	185	No	0.25	192	No	0.13	195	No	0.03
	50	201	187	No	0.30	194	No	0.23	197	No	0.11
	55	201	189	No	0.39	196	No	0.35	199	No	0.27
	60	201	191	Yes	0.50	198	Yes	0.50	201	Yes	0.50
	65	201	193	Yes	0.61	200	Yes	0.65	203	Yes	0.73
	70	201	195	Yes	0.66	202	Yes	0.77	206	Yes	0.94
	75	201	198	Yes	0.79	205	Yes	0.91	208	Yes	0.99
	80	201	201	Yes	0.89	207	Yes	0.95	211	Yes	>0.99
	85	201	204	Yes	0.93	211	Yes	0.99	214	Yes	>0.99
90	201	208	Yes	0.98	215	Yes	>0.99	218	Yes	>0.99	
95	201	214	Yes	>0.99	220	Yes	>0.99	224	Yes	>0.99	
4	5	209	169	No	<0.01	176	No	<0.01	178	No	<0.01
	10	209	175	No	<0.01	182	No	<0.01	184	No	<0.01
	15	209	179	No	<0.01	186	No	<0.01	188	No	<0.01
	20	209	183	No	0.01	189	No	<0.01	191	No	<0.01
	25	209	185	No	0.03	192	No	<0.01	194	No	<0.01
	30	209	188	No	0.05	194	No	0.01	196	No	<0.01
	35	209	190	No	0.08	196	No	0.03	199	No	<0.01
	40	209	192	No	0.13	198	No	0.06	201	No	0.01
	45	209	195	No	0.20	200	No	0.09	203	No	0.03
	50	209	197	No	0.29	202	No	0.17	205	No	0.11
	55	209	199	No	0.39	205	No	0.35	207	No	0.27
	60	209	201	Yes	0.50	207	Yes	0.50	209	Yes	0.50
	65	209	203	Yes	0.56	209	Yes	0.65	211	Yes	0.73
	70	209	205	Yes	0.66	211	Yes	0.78	213	Yes	0.89
	75	209	208	Yes	0.80	213	Yes	0.87	216	Yes	0.99
	80	209	211	Yes	0.87	216	Yes	0.96	219	Yes	>0.99
	85	209	214	Yes	0.94	219	Yes	0.99	222	Yes	>0.99
90	209	218	Yes	0.97	223	Yes	>0.99	226	Yes	>0.99	
95	209	224	Yes	>0.99	229	Yes	>0.99	232	Yes	>0.99	

Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
5	5	214	178	No	<0.01	183	No	<0.01	185	No	<0.01
	10	214	183	No	<0.01	189	No	<0.01	191	No	<0.01
	15	214	187	No	0.01	193	No	<0.01	194	No	<0.01
	20	214	191	No	0.02	196	No	<0.01	198	No	<0.01
	25	214	193	No	0.04	198	No	<0.01	200	No	<0.01
	30	214	196	No	0.08	201	No	0.02	203	No	<0.01
	35	214	198	No	0.11	203	No	0.04	205	No	<0.01
	40	214	200	No	0.17	205	No	0.09	207	No	0.01
	45	214	202	No	0.24	207	No	0.17	209	No	0.06
	50	214	204	No	0.34	209	No	0.28	211	No	0.17
	55	214	207	No	0.44	211	No	0.42	213	No	0.38
	60	214	209	Yes	0.56	213	Yes	0.58	215	Yes	0.62
	65	214	211	Yes	0.66	215	Yes	0.72	217	Yes	0.83
	70	214	213	Yes	0.71	217	Yes	0.78	219	Yes	0.94
	75	214	216	Yes	0.83	220	Yes	0.91	222	Yes	0.99
	80	214	218	Yes	0.89	222	Yes	0.96	224	Yes	>0.99
	85	214	221	Yes	0.94	226	Yes	0.99	228	Yes	>0.99
90	214	225	Yes	0.98	229	Yes	>0.99	231	Yes	>0.99	
95	214	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	

Reading											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
7	5	220	187	No	<0.01	190	No	<0.01	191	No	<0.01
	10	220	193	No	<0.01	196	No	<0.01	197	No	<0.01
	15	220	197	No	0.01	200	No	<0.01	201	No	<0.01
	20	220	200	No	0.02	203	No	<0.01	205	No	<0.01
	25	220	203	No	0.04	206	No	0.01	207	No	<0.01
	30	220	206	No	0.10	209	No	0.04	210	No	<0.01
	35	220	208	No	0.16	211	No	0.09	212	No	0.01
	40	220	210	No	0.24	213	No	0.12	214	No	0.03
	45	220	212	No	0.28	215	No	0.22	216	No	0.11
	50	220	214	No	0.39	217	No	0.35	218	No	0.27
	55	220	216	Yes	0.50	219	Yes	0.50	220	Yes	0.50
	60	220	218	Yes	0.61	221	Yes	0.65	223	Yes	0.83
	65	220	221	Yes	0.72	223	Yes	0.78	225	Yes	0.94
	70	220	223	Yes	0.81	226	Yes	0.91	227	Yes	0.99
	75	220	225	Yes	0.88	228	Yes	0.96	229	Yes	>0.99
	80	220	228	Yes	0.94	231	Yes	0.99	232	Yes	>0.99
	85	220	231	Yes	0.97	234	Yes	>0.99	235	Yes	>0.99
90	220	235	Yes	0.99	238	Yes	>0.99	239	Yes	>0.99	
95	220	241	Yes	>0.99	244	Yes	>0.99	245	Yes	>0.99	
8	5	224	190	No	<0.01	193	No	<0.01	194	No	<0.01
	10	224	196	No	<0.01	199	No	<0.01	200	No	<0.01
	15	224	200	No	0.01	203	No	<0.01	204	No	<0.01
	20	224	204	No	0.02	206	No	<0.01	207	No	<0.01
	25	224	207	No	0.05	209	No	0.01	210	No	<0.01
	30	224	209	No	0.08	212	No	0.02	213	No	<0.01
	35	224	211	No	0.11	214	No	0.04	215	No	<0.01
	40	224	214	No	0.20	216	No	0.09	217	No	0.01
	45	224	216	No	0.29	218	No	0.17	220	No	0.11
	50	224	218	No	0.39	221	No	0.35	222	No	0.27
	55	224	220	No	0.45	223	Yes	0.50	224	Yes	0.50
	60	224	222	Yes	0.55	225	Yes	0.65	226	Yes	0.73
	65	224	225	Yes	0.71	227	Yes	0.78	228	Yes	0.89
	70	224	227	Yes	0.80	229	Yes	0.87	231	Yes	0.99
	75	224	230	Yes	0.87	232	Yes	0.96	233	Yes	>0.99
	80	224	232	Yes	0.92	235	Yes	0.99	236	Yes	>0.99
	85	224	236	Yes	0.97	238	Yes	>0.99	239	Yes	>0.99
90	224	240	Yes	0.99	242	Yes	>0.99	243	Yes	>0.99	
95	224	246	Yes	>0.99	248	Yes	>0.99	249	Yes	>0.99	

Table 3.6. Proficiency Projection based on RIT Scores—Mathematics

Mathematics											
Grade	Start %ile	Spring Cut	Fall		Winter			Spring			
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
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	
4	5	214	176	No	<0.01	182	No	<0.01	185	No	<0.01
	10	214	181	No	<0.01	187	No	<0.01	191	No	<0.01
	15	214	185	No	<0.01	191	No	<0.01	194	No	<0.01
	20	214	187	No	0.01	194	No	<0.01	197	No	<0.01
	25	214	190	No	0.02	196	No	<0.01	200	No	<0.01
	30	214	192	No	0.04	198	No	0.01	202	No	<0.01
	35	214	194	No	0.07	200	No	0.02	205	No	<0.01
	40	214	196	No	0.13	202	No	0.04	207	No	0.01
	45	214	198	No	0.21	204	No	0.10	209	No	0.04
	50	214	200	No	0.32	206	No	0.20	211	No	0.15
	55	214	201	No	0.37	208	No	0.33	212	No	0.25
	60	214	203	Yes	0.50	210	Yes	0.50	214	Yes	0.50
	65	214	205	Yes	0.63	212	Yes	0.67	217	Yes	0.85
	70	214	207	Yes	0.74	214	Yes	0.80	219	Yes	0.96
	75	214	209	Yes	0.83	216	Yes	0.90	221	Yes	0.99
	80	214	212	Yes	0.93	219	Yes	0.97	224	Yes	>0.99
	85	214	214	Yes	0.96	221	Yes	0.99	227	Yes	>0.99
90	214	218	Yes	0.99	225	Yes	>0.99	230	Yes	>0.99	
95	214	223	Yes	>0.99	231	Yes	>0.99	236	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
5	5	222	184	No	<0.01	189	No	<0.01	191	No	<0.01
	10	222	190	No	<0.01	194	No	<0.01	197	No	<0.01
	15	222	193	No	<0.01	198	No	<0.01	201	No	<0.01
	20	222	196	No	<0.01	201	No	<0.01	205	No	<0.01
	25	222	199	No	0.02	204	No	<0.01	207	No	<0.01
	30	222	201	No	0.05	206	No	0.01	210	No	<0.01
	35	222	203	No	0.08	209	No	0.03	212	No	<0.01
	40	222	205	No	0.14	211	No	0.07	215	No	0.01
	45	222	207	No	0.22	213	No	0.15	217	No	0.04
	50	222	209	No	0.32	215	No	0.26	219	No	0.15
	55	222	211	No	0.44	217	No	0.42	221	No	0.37
	60	222	213	Yes	0.56	219	Yes	0.58	223	Yes	0.63
	65	222	215	Yes	0.68	221	Yes	0.74	225	Yes	0.85
	70	222	217	Yes	0.78	223	Yes	0.85	228	Yes	0.98
	75	222	219	Yes	0.86	225	Yes	0.93	230	Yes	>0.99
	80	222	222	Yes	0.94	228	Yes	0.98	233	Yes	>0.99
	85	222	225	Yes	0.98	231	Yes	>0.99	236	Yes	>0.99
90	222	229	Yes	>0.99	235	Yes	>0.99	240	Yes	>0.99	
95	222	234	Yes	>0.99	241	Yes	>0.99	246	Yes	>0.99	
6	5	225	188	No	<0.01	192	No	<0.01	194	No	<0.01
	10	225	194	No	<0.01	198	No	<0.01	200	No	<0.01
	15	225	198	No	<0.01	202	No	<0.01	205	No	<0.01
	20	225	201	No	0.01	205	No	<0.01	208	No	<0.01
	25	225	204	No	0.02	208	No	<0.01	211	No	<0.01
	30	225	206	No	0.04	211	No	0.01	214	No	<0.01
	35	225	209	No	0.10	213	No	0.03	216	No	<0.01
	40	225	211	No	0.17	215	No	0.07	218	No	0.01
	45	225	213	No	0.27	217	No	0.14	221	No	0.08
	50	225	215	No	0.38	220	No	0.34	223	No	0.25
	55	225	217	Yes	0.50	222	Yes	0.50	225	Yes	0.50
	60	225	219	Yes	0.62	224	Yes	0.66	227	Yes	0.75
	65	225	221	Yes	0.73	226	Yes	0.80	230	Yes	0.96
	70	225	223	Yes	0.83	228	Yes	0.90	232	Yes	0.99
	75	225	226	Yes	0.92	231	Yes	0.97	235	Yes	>0.99
	80	225	228	Yes	0.96	234	Yes	0.99	238	Yes	>0.99
	85	225	231	Yes	0.99	237	Yes	>0.99	241	Yes	>0.99
90	225	235	Yes	>0.99	241	Yes	>0.99	245	Yes	>0.99	
95	225	241	Yes	>0.99	247	Yes	>0.99	252	Yes	>0.99	

Mathematics											
Grade	Start %ile	Spring Cut	Fall			Winter			Spring		
			Fall RIT	Projected Proficiency		Winter RIT	Projected Proficiency		Spring RIT	Projected Proficiency	
				Proficient	Prob.		Proficient	Prob.		Proficient	Prob.
7	5	231	192	No	<0.01	194	No	<0.01	196	No	<0.01
	10	231	198	No	<0.01	201	No	<0.01	203	No	<0.01
	15	231	202	No	<0.01	205	No	<0.01	207	No	<0.01
	20	231	206	No	<0.01	209	No	<0.01	211	No	<0.01
	25	231	208	No	<0.01	212	No	<0.01	214	No	<0.01
	30	231	211	No	0.01	215	No	<0.01	217	No	<0.01
	35	231	213	No	0.03	217	No	0.01	220	No	<0.01
	40	231	216	No	0.07	219	No	0.03	222	No	<0.01
	45	231	218	No	0.17	222	No	0.10	224	No	0.01
	50	231	220	No	0.26	224	No	0.20	227	No	0.08
	55	231	222	No	0.37	226	No	0.33	229	No	0.25
	60	231	225	Yes	0.56	229	Yes	0.58	231	Yes	0.50
	65	231	227	Yes	0.69	231	Yes	0.74	234	Yes	0.85
	70	231	229	Yes	0.79	233	Yes	0.86	236	Yes	0.96
	75	231	232	Yes	0.90	236	Yes	0.96	239	Yes	>0.99
	80	231	235	Yes	0.96	239	Yes	0.99	242	Yes	>0.99
	85	231	238	Yes	0.99	243	Yes	>0.99	246	Yes	>0.99
90	231	243	Yes	>0.99	247	Yes	>0.99	251	Yes	>0.99	
95	231	249	Yes	>0.99	254	Yes	>0.99	257	Yes	>0.99	
8	5	236	194	No	<0.01	196	No	<0.01	197	No	<0.01
	10	236	201	No	<0.01	203	No	<0.01	205	No	<0.01
	15	236	205	No	<0.01	208	No	<0.01	210	No	<0.01
	20	236	209	No	<0.01	212	No	<0.01	214	No	<0.01
	25	236	212	No	<0.01	215	No	<0.01	217	No	<0.01
	30	236	215	No	0.02	218	No	<0.01	220	No	<0.01
	35	236	218	No	0.03	221	No	<0.01	223	No	<0.01
	40	236	220	No	0.06	223	No	0.01	225	No	<0.01
	45	236	223	No	0.12	226	No	0.05	228	No	<0.01
	50	236	225	No	0.19	228	No	0.11	230	No	0.02
	55	236	227	No	0.28	231	No	0.27	233	No	0.15
	60	236	230	No	0.44	233	No	0.42	235	No	0.37
	65	236	232	Yes	0.56	236	Yes	0.66	238	Yes	0.75
	70	236	235	Yes	0.72	238	Yes	0.80	241	Yes	0.96
	75	236	238	Yes	0.84	241	Yes	0.93	244	Yes	>0.99
	80	236	241	Yes	0.93	244	Yes	0.98	247	Yes	>0.99
	85	236	245	Yes	0.98	248	Yes	>0.99	251	Yes	>0.99
90	236	249	Yes	>0.99	253	Yes	>0.99	256	Yes	>0.99	
95	236	256	Yes	>0.99	260	Yes	>0.99	263	Yes	>0.99	

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