2018 Linking Study: Predicting Performance on the Nevada Smarter Balanced Grade 3 ELA Assessment based on MAP Growth Reading K–3 Scores

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NWEA Psychometric Solutions

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Executive Summary

This study produced a set of cut scores on MAP® Growth™ Reading for Grades K–3 that correspond to the Nevada Smarter Balanced Grade 3 English Language Arts (ELA) achievement levels for each grade, as shown in Table 3.3. Currently, the 40th percentile rank on the MAP Growth Reading assessment is Nevada's Read by Grade 3 indicator for "struggling readers" who need additional services beyond regular classroom instruction. Based on the findings of this study, NWEA recommends continuing to use the 40th percentile as an indicator, as shown in Table 4.1. This study also used the 2015 NWEA norming study results to project a student's probability to meet proficiency based on that student's prior MAP Growth scores in fall and winter.

By using matched score data from a sample of Nevada Smarter Balanced Grade 3 ELA students, the study demonstrates that MAP Growth scores can predict whether a student will reach proficiency on the Smarter Balanced Grade 3 ELA assessment based on his or her MAP Growth scores, as shown by the classification accuracy results in Section 3.4. The overall classification accuracy rate ranges from 0.73 to 0.88 across all grades, suggesting that the MAP Growth cuts for each content area and grade are good predictors of students' proficiency status on the Smarter Balanced Grade 3 ELA test. For Grades K–2, the classification accuracy rate refers to how well the MAP Growth cuts can predict students' proficiency status on the Smarter Balanced Grade 3 ELA test in Grade 3. Consequently, the further back from Grade 3 that the cut scores were extrapolated, the lower the expected classification accuracy rate.

The results of this study can help educators predict student performance on the Smarter Balanced Grade 3 ELA tests as early as possible and identify students at risk of failing to meet required standards so they can receive the necessary resources and assistance to meet their goals.

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 the MAP® Growth™ interim test scores. An 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 2018 to statistically connect the scales of the Nevada Smarter Balanced Grade 3 English Language Arts (ELA) summative assessment with those of the MAP Growth Reading K–3 assessments taken during the Spring 2018 term. Specifically, this report presents the following:

- Cut scores on the MAP Growth Reading scale for Grade 3 that correspond to the benchmarks on the Smarter Balanced Grade 3 ELA assessment.
- Cut scores on the MAP Growth Reading scale for Grades K–2 that are extrapolated from the current Grade 3 cohort using the 2015 MAP Growth norms.
- Classification accuracy summary statistics based on estimated MAP Growth cut scores.
- The probability of meeting or exceeding grade-level proficiency on the Smarter Balanced Grade 3 ELA assessments based on the observed MAP Growth scores taken during different terms in the same school year.

The purpose of this study is to determine the MAP Growth Reading scores that predict whether students are on track for proficiency in ELA by Grade 3 on the Smarter Balanced assessment. The cut scores from the linking study are intended to support the state to identify students who need early intervention for reading proficiency as part of the Nevada Read by Grade 3 Program.

1.2. Assessment Overview

1.2.1. Nevada Read by Grade 3 Program

The purpose of the Nevada Read by Grade 3 Program is to dramatically improve student achievement by ensuring that all Nevada students can read proficiently by the end of Grade 3. A primary intent of the program is to provide effective, early interventions for all K–3 students struggling in reading.

A student enrolled in Grade 3 must be retained in Grade 3, rather than promoted to Grade 4, if the student does not obtain a passing score on the Smarter Balanced ELA assessment, although there are good-cause exemptions that educators can initiate to determine whether to promote certain students to Grade 4. MAP Growth Reading is administered to help track if students are making progress toward reading success by the end of Grade 3. Multiple measures are considered to determine exemption from retention, including if a student has received intensive remediation in reading for two or more years but still demonstrates a deficiency in reading.

For students in Grades K–3, MAP Growth test results provide early evidence that a student needs immediate intervention to improve their reading ability. For the 2017–2018 school year, the Nevada Department of Education (NDE) decided the following (NDE, 2017):

- All Grades K–1 students will be assessed by MAP Growth K–2.
- All Grades 2–3 students will be assessed by MAP Growth 2–5.
- MAP Growth K–3 student data will not be used as part of NDE's school accountability framework. It will, however, be used as an indicator for projected proficiency on Nevada's Grade 3 ELA test on the Smarter Balanced assessment.
- Nevada will use the term "Read by Grade 3 Indicator" to identify K–3 students who are struggling in reading.

In 2017–2018, the 40th percentile rank on the MAP Growth Reading assessment is Nevada's Read by Grade 3 indicator. Students who score at or below the 40th mark on MAP Growth Reading will be identified as "struggling readers" in the Read by Grade 3 Program, thus qualifying them for additional services beyond regular classroom instruction.

1.2.2. MAP Growth

MAP Growth Reading is a computer adaptive interim assessment aligned to the Nevada academic content standards. The MAP Growth Reading assessments are comparable to the Nevada content standards in ELA. MAP Growth scores are reported on a vertical scale with a range of 100–350 in Rasch Unit (RIT). MAP Growth Reading has its own scale. To aid interpretation of MAP Growth scores, NWEA periodically conducts norming studies of student and school performance on MAP Growth. The most recent MAP Growth norming study by Thum & Hauser (2015) employed multi-level growth models on nearly 500,000 longitudinal test scores from over 100,000 students that were weighted to create large, nationally representative norms.

2. Methods

2.1. Data Collection

The linking study was based on data from the Smarter Balanced and MAP Growth assessments taken in Spring 2018. Once the Smarter Balanced data was received from the NDE, each student's Smarter Balanced record was matched to their MAP Growth score. Matching was performed using the student's first and last names, date of birth, student ID, and other available identifying information. The final study sample included students for whom both Smarter Balanced and MAP Growth scores were available.

Because Nevada students begin taking the Smarter Balanced assessment in Grade 3, this study includes longitudinal information to link the Smarter Balanced assessment to MAP Growth for Grades K–2. To accomplish this, 2017–2018 Smarter Balanced Grade 3 results are linked to MAP Growth data from Grade 3 students in 2017–2018, Grade 2 students in 2016–2017, Grade 1 students in 2015–2016, and Grade K students in 2014–2015. In this way, the data came from the same cohort of students beginning in 2014–2015 when they were in kindergarten and continuing through Grades 1–3.

2.2. Equipercentile Linking Procedure

The equipercentile procedure (e.g., Kolen & Brennan, 2004) was used to link Smarter Balanced scores and MAP Growth scores. This procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of tests at or below each score).

Consider the linked scores between two tests. Let x represent a score on Test X (e.g., Smarter Balanced). 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 Smarter Balanced on the scale of MAP Growth, $P(x)$ is the percentile rank of a given score on Test X, and G^{-1} is the inverse of the percentile rank function for Test Y that indicates the score on Test Y corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the score distributions and equipercentile linking curve.

Spring cuts for Grades K–2 were extrapolated from the current Grade 3 student cohort. Using NWEA's 2015 MAP Growth norms data, the previous grade's spring scores were determined by obtaining the score that corresponds to the same percentile rank as the current Grade 3 cuts.

2.3. Classification Accuracy Summary Statistics

The degree to which MAP Growth tests predict student proficiency status on the Smarter Balanced test can be described using classification accuracy statistics, which are important indicators for evaluating reliability and validity of classification results.

Table 2.1 describes the classification accuracy statistics for MAP Growth as it relates to the Smarter Balanced Grade 3 ELA test.

Table 2.1. Classification Accuracy Data Associated with MAP Growth and Smarter Balanced

Classification Accuracy Statistic	Description*	Interpretation
Overall Classification Accuracy Rate	(TP + TN) / (total sample size)	The proportion of students in the study sample whose proficiency classification on the state test was correctly predicted by MAP Growth cut scores (Pommerich, Hanson, Harris, & Sconing, 2004).
Sensitivity	TP / (TP + FN)	The proportion of proficient students who were correctly identified on the MAP Growth test as such.
Specificity	TN / (TN + FP)	The proportion of below-proficient students who were correctly identified on the MAP Growth test as such.
False Negative Rate	FN / (FN + TP)	The proportion of proficient students who were incorrectly predicted by MAP Growth test to be below proficiency.
False Positive Rate	FP / (FP + TN)	The proportion of below-proficient students who were incorrectly predicted by MAP Growth test to be proficient.

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

2.4. Proficiency Projection

MAP Growth conditional growth norms provide students' expected score gains across testing seasons (Thum & Hauser, 2015). This information was used to estimate the previous fall and winter terms' MAP Growth scores that would meet the spring cut, considering the growth that is expected of the previous term's RIT value. Additionally, the growth norms data were used to calculate the probability of reaching proficiency on the Smarter Balanced test based on the student's MAP Growth scores from prior terms.

Equation 2 was used to determine the fall or winter MAP Growth score needed to reach the spring cut score, considering the expected growth associated with the previous RIT score:

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

where:

- $RIT_{SpringCut}$ is the MAP Growth spring cuts
- $RIT_{previous}$ is the unknown fall or winter RIT score
- g is the expected growth from fall or winter to spring corresponding to $RIT_{previous}$.

Equation 3 was used to calculate the probability of a student achieving Level 3 (i.e., the proficient benchmark) on the Smarter Balanced test based on his or her fall or winter MAP Growth score:

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

where:

- Φ is a standardized normal cumulative distribution.
- $RIT_{previous}$ is the student's RIT score in fall or winter.
- g is the expected growth from fall or winter to spring corresponding to that previous RIT.
- $RIT_{SpringCut}$ is the MAP Growth Level 3 cut score for spring.
- SD is the conditional standard deviation of growth from fall or winter to spring.

Equation 4 was used to estimate the probability of a student achieving Level 3 on the Smarter Balanced test based on his or her spring score RIT_{Spring}:

$$Pr(Achieving\ Level\ 3\ in\ spring\ |\ spring\ RIT) = \Phi\left(\frac{RIT_{Spring} - RIT_{SpringCut}}{SE}\right) \quad (4)$$

where SE is the standard error of measurement for MAP Growth.

3. Results

3.1. Student Sample

Table 3.1 shows the number of students who took the Smarter Balanced assessment in Spring 2018 and the sample of students included in the linking study. After the matching procedure, the final linking study student sample is 35,182. This is approximately 96% of the general student population, which provides very good representation in terms of demographic characteristics.

Table 3.1. Demographics of the Study Sample

		Race/Ethnicity*						Gender**	
	N	White	Black	Hispanic	Asian/PI	AI/AN	MR	Female	Male
General	36,809	31.32%	11.82%	42.95%	6.31%	0.86%	6.74%	48.96%	51.04%
Sample	35,182	31.33%	11.57%	43.20%	6.31%	0.87%	6.73%	48.90%	51.07%

*Asian/PI = Asian/Pacific Islander. AI/AN = American Indian/Alaska Native. MR = Multi-Race.
**The sum of the percentages is not 100% due to missing information of gender for some students.

3.2. Descriptive Statistics

Table 3.2 provides descriptive statistics of the Smarter Balanced ELA and MAP Growth Reading scores for Spring 2018, including the student *n*-count, the correlation coefficient (*r*) between the two scales, the mean test score (RIT score for MAP Growth), the standard deviation (SD), and the minimum and maximum scores. The descriptive statistics for Smarter Balanced are only provided for Grade 3 because that is when students begin to take the Smarter Balanced ELA assessment. In general, the average RIT score increases as the grade level goes up. A similar increase is also seen in the minimum and maximum RIT scores. This is to be expected and is consistent with MAP Growth's vertical scale. The correlation coefficient indicates that the relationship between MAP Growth and Smarter Balanced scores is high. This indicates that MAP Growth is a good indicator for predicting student performance on the Smarter Balanced assessment.

Table 3.2. Descriptive Statistics of MAP Growth and Smarter Balanced Scores

			MAP Growth Reading				Smarter Balanced ELA			
Grade	N	*r*	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
K	4,796	--	157.14	11.85	114	208	--	--	--	--
1	5,736	--	176.54	14.84	113	224	--	--	--	--
2	7,420	--	186.66	16.04	140	233	--	--	--	--
3	35,182	0.85	196.56	16.29	141	248	2421.50	82.88	2114	2623

3.3. Equipercentile Linking Cut Scores

Table 3.3 presents the Smarter Balanced scale score range for each achievement level and the corresponding MAP Growth scores (obtained from equipercentile linking) and percentile ranges. This table can be used to predict a student's likely achievement level on the Smarter Balanced assessment when MAP Growth is taken in the spring, fall, or winter. For example, a Grade 3 student who obtained a MAP Growth Reading score of 203 in the spring is likely to be at a Level 3 on the Smarter Balanced assessment taken during that same testing season.

Table 3.3. MAP Growth Cut Scores Corresponding to Smarter Balanced Scores when MAP Growth is taken in Spring, Fall, or Winter

Smarter Balanced ELA								
Grade	**Level 1**		**Level 2**		**Level 3**		**Level 4**	
3	2114–2366		2367–2431		2432–2489		2490–2623	
MAP Growth Reading (Fall)								
	Level 1		**Level 2**		**Level 3**		**Level 4**	
Grade*	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
K	100–128	1–17	129–141	18–51	142–153	52–82	154–350	83–99
1	100–148	1–17	149–161	18–52	162–171	53–79	172–350	80–99
2	100–161	1–19	162–175	20–52	176–187	53–79	188–350	80–99
3	100–175	1–20	176–189	21–53	190–201	54–79	202–350	80–99
MAP Growth Reading (Winter)								
K	100–140	1–19	141–151	20–50	152–161	51–78	162–350	79–99
1	100–160	1–20	161–172	21–52	173–181	53–76	182–350	77–99
2	100–172	1–21	173–185	22–53	186–195	54–77	196–350	78–99
3	100–183	1–21	184–196	22–52	197–207	53–78	208–350	79–99
MAP Growth Reading (Spring)								
	Level 1		**Level 2**		**Level 3**		**Level 4**	
Grade*	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**	**RIT**	**Percentile**
K	100–148	1–22	149–158	23–51	159–167	52–76	168–350	77–99
1	100–166	1–22	167–178	23–52	179–187	53–75	188–350	76–99
2	100–177	1–23	178–189	24–52	190–199	53–76	200–350	77–99
3	100–187	1–23	188–199	24–52	200–209	53–76	210–350	77–99

*Spring cut scores for Grades K–2 were extrapolated from the Grade 3 cohort using 2015 MAP Growth norms.

3.4. Classification Accuracy Summary Statistics

Table 3.4 presents the overall classification accuracy rate, sensitivity, specificity, the false positive (FP) rate, and the false negative (FN) rate (see Table 2.1 for definitions). These summary statistics provide insight into the predictive validity of MAP Growth tests on the Smarter Balanced test. The overall classification accuracy rate ranges from 0.73 to 0.88. These values suggest that the MAP Growth cut scores for each content area and grade are good predictors of the students' proficiency status on the Smarter Balanced test. For Grades K–2, the classification accuracy rate refers to how well the MAP Growth cuts shown can predict students' proficiency status on the Smarter Balanced test in Grade 3. Consequently, the further back from Grade 3 that the cut scores were extrapolated, the lower the expected classification accuracy rate.

Table 3.4. Classification Accuracy Summary Statistics for MAP Growth and Smarter Balanced Proficiency for Grades K–3 Students

			Cut Score			**Rate****			
Grade*	**Level**	**Sample Size**	**MAP Growth**	**Smarter Balanced**	**Class. Accuracy**	**FP**	**FN**	**Sensitivity**	**Specificity**
K	2 & Above	4,796	149	2367	0.77	0.52	0.12	0.88	0.48
	3 & Above	4,796	159	2432	0.73	0.25	0.29	0.71	0.75
	4	4,796	168	2490	0.84	0.09	0.46	0.54	0.91

Grade*	Level	Sample Size	Cut Score		Class. Accuracy	Rate**		Sensitivity	Specificity
			MAP Growth	Smarter Balanced		FP	FN		
1	2 & Above	5,736	167	2367	0.81	0.39	0.11	0.90	0.61
	3 & Above	5,736	179	2432	0.80	0.19	0.23	0.77	0.82
	4	5,736	188	2490	0.85	0.12	0.27	0.73	0.88
2	2 & Above	7,420	178	2367	0.83	0.32	0.11	0.89	0.68
	3 & Above	7,420	190	2432	0.81	0.19	0.18	0.82	0.81
	4	7,420	200	2490	0.86	0.11	0.28	0.73	0.89
3	2 & Above	35,182	188	2367	0.88	0.26	0.08	0.93	0.74
	3 & Above	35,182	200	2432	0.85	0.15	0.15	0.85	0.85
	4	35,182	210	2490	0.88	0.08	0.26	0.74	0.93

*Spring cut scores for Grades K–2 were extrapolated from the Grade 3 cohort using 2015 MAP Growth norms.
**FP = false positives. FN = false negatives.

3.5. Proficiency Projection

Table 3.5 presents the estimated probability of meeting the Level 3 benchmark (i.e., being classified as proficient on the Smarter Balanced Grade 3 ELA assessment) based on students' observed MAP Growth score when MAP Growth is taken in the spring. Table 3.6 presents the estimated probability of meeting the Level 3 benchmark when MAP Growth is taken in the fall or winter prior to taking the Smarter Balanced test. The conditional growth norms provided in the 2015 MAP Growth norms report were used to calculate this information (Thum & Hauser, 2015). For example, a Grade 3 student who obtained a MAP Growth Reading score of 190 in the fall has an 50% chance of reaching Level 3 or higher on the Smarter Balanced test taken in the spring.

Table 3.5. Proficiency Projection and Probability of Reaching Level 3 on Smarter Balanced when MAP Growth is taken in Spring

Grade	Start Percentile	ELA/Reading (Spring)			
		Spring RIT	Projected Proficiency		
			Cut Score	Level 3	Prob.*
2	5	164	190	No	<0.01
	10	169	190	No	<0.01
	15	173	190	No	<0.01
	20	176	190	No	<0.01
	25	178	190	No	<0.01
	30	181	190	No	<0.01
	35	183	190	No	0.01
	40	185	190	No	0.06
	45	187	190	No	0.17
	50	189	190	No	0.38
	55	191	190	Yes	0.62
	60	193	190	Yes	0.83
	65	195	190	Yes	0.94
	70	197	190	Yes	0.99

Grade	Start Percentile	ELA/Reading (Spring)			
		Spring RIT	Projected Proficiency		
			Cut Score	Level 3	Prob.*
3	75	199	190	Yes	>0.99
	80	201	190	Yes	>0.99
	85	204	190	Yes	>0.99
	90	208	190	Yes	>0.99
	95	214	190	Yes	>0.99
	5	174	200	No	<0.01
	10	179	200	No	<0.01
	15	183	200	No	<0.01
	20	186	200	No	<0.01
	25	188	200	No	<0.01
	30	191	200	No	<0.01
	35	193	200	No	0.01
	40	195	200	No	0.06
	45	197	200	No	0.17
	50	199	200	No	0.38
	55	201	200	Yes	0.62
	60	202	200	Yes	0.73
	65	204	200	Yes	0.89
	70	207	200	Yes	0.99
	75	209	200	Yes	>0.99
	80	211	200	Yes	>0.99
	85	214	200	Yes	>0.99
	90	218	200	Yes	>0.99
	95	223	200	Yes	>0.99

*Prob. = Probability of obtaining proficient status on the Smarter Balanced Grade 3 ELA test in the spring.

Table 3.6. Proficiency Projection and Probability of Reaching Level 3 on Smarter Balanced in Spring when MAP Growth is taken in Fall or Winter

		ELA/Reading (Fall)				ELA/Reading (Winter)			
			Projected Proficiency				Projected Proficiency		
Grade	Start Percentile	Fall RIT	Spring Cut	Level 3	Prob.*	Winter RIT	Spring Cut	Level 3	Prob.*
2	5	149	190	No	<0.01	160	No	<0.01	190
	10	155	190	No	0.01	165	No	<0.01	190
	15	159	190	No	0.03	169	No	<0.01	190
	20	162	190	No	0.06	172	No	0.01	190
	25	164	190	No	0.10	174	No	0.02	190
	30	167	190	No	0.15	176	No	0.05	190
	35	169	190	No	0.22	178	No	0.10	190
	40	171	190	No	0.3	180	No	0.18	190
	45	173	190	No	0.35	182	No	0.29	190
	50	175	190	No	0.45	184	No	0.43	190
	55	177	190	Yes	0.55	186	Yes	0.5	190
	60	179	190	Yes	0.6	188	Yes	0.64	190
	65	181	190	Yes	0.7	190	Yes	0.77	190
	70	183	190	Yes	0.78	192	Yes	0.86	190
	75	185	190	Yes	0.81	194	Yes	0.93	190
	80	188	190	Yes	0.90	197	Yes	0.98	190
	85	191	190	Yes	0.94	200	Yes	0.99	190
	90	195	190	Yes	0.98	203	Yes	>0.99	190
	95	200	190	Yes	0.99	209	Yes	>0.99	190
3	5	162	200	No	<0.01	171	No	<0.01	200
	10	168	200	No	0.01	176	No	<0.01	200
	15	172	200	No	0.02	180	No	<0.01	200
	20	175	200	No	0.03	183	No	0.01	200
	25	178	200	No	0.08	185	No	0.02	200
	30	180	200	No	0.13	188	No	0.06	200
	35	182	200	No	0.16	190	No	0.09	200
	40	184	200	No	0.24	192	No	0.17	200
	45	186	200	No	0.34	194	No	0.28	200
	50	188	200	No	0.39	196	No	0.42	200
	55	190	200	Yes	0.50	198	Yes	0.58	200
	60	192	200	Yes	0.61	199	Yes	0.65	200
	65	194	200	Yes	0.66	201	Yes	0.78	200
	70	197	200	Yes	0.80	204	Yes	0.91	200
	75	199	200	Yes	0.87	206	Yes	0.94	200
	80	202	200	Yes	0.92	208	Yes	0.97	200
	85	205	200	Yes	0.97	211	Yes	0.99	200
	90	209	200	Yes	0.99	215	Yes	>0.99	200
	95	214	200	Yes	>0.99	221	Yes	>0.99	200

*Prob. = Probability of obtaining proficient status on the Smarter Balanced Grade 3 ELA test in the spring.

4. Discussion & Recommendation

This study was performed to help guide the NDE in identifying students who should receive additional help to improve their reading comprehension ability. Recent research (Balu et al., 2015) shows that students who fall *just* below a proficiency cut score may need to be placed in the group most similar to their knowledge and skill state (i.e., children above the cut) to ensure that their reading achievement is not hindered. This suggests that a multiple measures process-based approach should be used for instructional decisions in which data from a large-scale assessment is coupled with decision making at the local level to ensure that students near cut points are placed in the right courses and intervention level to grow their skills.

Under the current Nevada Read by Grade 3 model, the indicator for identifying a struggling reader is the 40th percentile on the MAP Growth Reading assessment. Table 4.1 shows the RIT scores at the 40th percentile and the Level 2 and Level 3 cut score ranges. Bolded numbers indicate the cut scores considered to be at least proficient on the Smarter Balanced Grade 3 ELA assessment. As shown in the table, the use of the 40th percentile in the Fall translates to a student who is projected to be in Level 2 by the end of the year when typical growth is considered but who is functioning in the Level 1 category from a present level of functioning perspective. Because students may deviate from predicted growth, we want to ensure students who are likely to be solidly in the Level 2 Range in younger grades are used for the intervention to ensure they receive support given that the relationships to Grade 3 summative scores are weaker in the more distal grades.

Table 4.1. RIT at 40th Percentile and Level 2 and Level 3 Cuts

	RIT at 40th Percentile		Level 2		Level 3	
Grade	RIT	Percentile	RIT	Percentile	RIT	Percentile
MAP Growth Reading (Fall)						
K	138	40	129–141	18–51	**142**–153	52–82
1	158	40	149–161	18–52	**162**–171	53–79
2	171	40	162–175	20–52	**176**–187	53–79
3	185	40	176–189	21–53	**190**–201	54–79
MAP Growth Reading (Winter)						
K			141–151	20–50	**152**–161	51–78
1			161–172	21–52	**173**–181	53–76
2			173–185	22–53	**186**–195	54–77
3			184–196	22–52	**197**–207	53–78
MAP Growth Reading (Spring)						
K			149–158	23–51	**159**–167	52–76
1			167–178	23–52	**179**–187	53–75
2			178–189	24–52	**190**–199	53–76
3			188–199	24–52	**200**–209	53–76

NWEA recommends that the 40th percentile remain the current indictor for intervention and that teachers use the Level 2 achievement level descriptors (ALDs) NWEA developed for the state as the content and skills the students should master by the end of the year. These provide on-grade and realistic achievement targets to grow students from fall to spring, recognizing that in the fall this score means students are in Level 1 compared to summative year end expectations. Thus, students must grow from Level 1 in the fall to Level 2 by the end of the year.

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Appendix A: MAP Growth Student Growth Projection

Table A.1. MAP Growth Student Growth Projection—Grade K

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
K	100	14	22	27	9
K	101	14	22	27	9
K	102	14	22	27	9
K	103	14	22	27	9
K	104	14	22	27	9
K	105	14	22	27	9
K	106	14	22	27	9
K	107	14	22	27	9
K	108	14	22	27	9
K	109	14	22	27	9
K	110	14	22	27	9
K	111	14	22	27	9
K	112	14	22	27	9
K	113	14	22	27	9
K	114	14	22	27	9
K	115	14	22	27	9
K	116	14	22	27	9
K	117	14	22	27	9
K	118	14	22	27	9
K	119	14	22	27	9
K	120	14	22	27	9
K	121	13	22	27	9
K	122	13	21	27	9
K	123	13	21	26	9
K	124	13	21	26	9
K	125	13	21	26	9
K	126	13	21	26	9
K	127	12	20	25	9
K	128	12	20	25	9
K	129	12	20	25	9
K	130	12	20	25	9
K	131	12	19	24	9
K	132	12	19	24	8
K	133	12	19	24	8
K	134	11	19	23	8
K	135	11	18	23	8
K	136	11	18	23	8
K	137	11	18	23	8
K	138	11	18	22	8
K	139	11	18	22	8
K	140	10	17	22	8

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
K	141	10	17	21	8
K	142	10	17	21	8
K	143	10	17	21	8
K	144	10	16	21	7
K	145	10	16	20	7
K	146	10	16	20	7
K	147	9	16	20	7
K	148	9	16	20	7
K	149	9	15	19	7
K	150	9	15	19	7
K	151	9	15	19	7
K	152	9	15	18	7
K	153	8	14	18	7
K	154	8	14	18	7
K	155	8	14	18	7
K	156	8	14	17	6
K	157	8	13	17	6
K	158	8	13	17	6
K	159	7	13	16	6
K	160	7	13	16	6
K	161	7	13	16	6
K	162	7	12	16	6
K	163	7	12	15	6
K	164	7	12	15	6
K	165	7	12	15	6
K	166	6	11	15	6
K	167	6	11	14	6
K	168	6	11	14	5
K	169	6	11	14	5
K	170	6	10	13	5
K	171	6	10	13	5
K	172	5	10	13	5
K	173	5	10	13	5
K	174	5	10	12	5
K	175	5	9	12	5
K	176	5	9	12	5
K	177	5	9	11	5
K	178	5	9	11	5
K	179	4	8	11	5
K	180	4	8	11	4
K	181	4	8	10	4
K	182	4	8	10	4
K	183	4	7	10	4
K	184	4	7	10	4

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
K	185	3	7	9	4
K	186	3	7	9	4
K	187	3	7	9	4
K	188	3	6	8	4
K	189	3	6	8	4
K	190	3	6	8	4
K	191	2	6	8	4
K	192	2	5	7	3
K	193	2	5	7	3
K	194	2	5	7	3
K	195	2	5	6	3
K	196	2	4	6	3
K	197	2	4	6	3
K	198	1	4	6	3
K	199	1	4	5	3
K	200	1	4	5	3
K	201	1	3	5	3
K	202	1	3	5	3
K	203	1	3	4	3
K	204	0	3	4	2
K	205	0	2	4	2
K	206	0	2	3	2
K	207	0	2	3	2
K	208	0	2	3	2
K	209	0	2	3	2
K	210	-1	1	2	2

Table A.2. MAP Growth Student Growth Projection—Grade 1

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
1	100	14	20	11	6
1	101	14	20	11	6
1	102	14	20	11	6
1	103	14	20	11	6
1	104	14	20	11	6
1	105	14	20	11	6
1	106	14	20	11	6
1	107	14	20	11	6
1	108	14	20	11	6
1	109	14	20	11	6
1	110	14	20	11	6
1	111	14	20	11	6
1	112	14	20	11	6
1	113	14	20	11	6
1	114	14	20	11	6

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
1	115	14	20	11	6
1	116	14	20	11	6
1	117	14	20	11	6
1	118	14	20	11	6
1	119	14	20	11	6
1	120	14	20	11	6
1	121	14	20	11	6
1	122	14	20	11	6
1	123	13	20	11	6
1	124	13	20	11	6
1	125	13	19	11	6
1	126	13	19	11	6
1	127	13	19	11	6
1	128	13	19	12	6
1	129	13	19	12	6
1	130	13	19	12	6
1	131	13	19	12	6
1	132	13	19	12	6
1	133	13	19	12	6
1	134	13	19	12	6
1	135	13	19	12	6
1	136	13	19	12	6
1	137	12	19	12	6
1	138	12	18	12	6
1	139	12	18	12	6
1	140	12	18	12	6
1	141	12	18	13	6
1	142	12	18	13	6
1	143	12	18	13	6
1	144	12	18	13	6
1	145	12	18	13	6
1	146	12	18	13	6
1	147	12	18	13	6
1	148	12	18	13	6
1	149	12	18	13	6
1	150	12	18	13	6
1	151	12	18	13	6
1	152	11	17	13	6
1	153	11	17	13	6
1	154	11	17	14	6
1	155	11	17	14	6
1	156	11	17	14	6
1	157	11	17	14	6
1	158	11	17	14	6

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
1	159	11	17	14	6
1	160	11	17	14	6
1	161	11	17	14	6
1	162	11	17	14	6
1	163	11	17	14	6
1	164	11	17	14	6
1	165	11	17	14	6
1	166	10	16	14	6
1	167	10	16	14	6
1	168	10	16	15	6
1	169	10	16	15	6
1	170	10	16	15	6
1	171	10	16	15	6
1	172	10	16	15	6
1	173	10	16	15	6
1	174	10	16	15	6
1	175	10	16	15	6
1	176	10	16	15	6
1	177	10	16	15	6
1	178	10	16	15	6
1	179	10	15	15	6
1	180	9	15	15	6
1	181	9	15	16	6
1	182	9	15	16	6
1	183	9	15	16	6
1	184	9	15	16	6
1	185	9	15	16	6
1	186	9	15	16	6
1	187	9	15	16	6
1	188	9	15	16	6
1	189	9	15	16	6
1	190	9	15	16	6
1	191	9	15	16	6
1	192	9	15	16	6
1	193	9	14	16	6
1	194	9	14	17	6
1	195	8	14	17	6
1	196	8	14	17	6
1	197	8	14	17	6
1	198	8	14	17	6
1	199	8	14	17	6
1	200	8	14	17	6
1	201	8	14	17	6
1	202	8	14	17	6

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
1	203	8	14	17	6
1	204	8	14	17	6
1	205	8	14	17	6
1	206	8	13	17	6
1	207	8	13	18	6
1	208	8	13	18	6
1	209	7	13	18	6
1	210	7	13	18	6

Table A.3. MAP Growth Student Growth Projection—Grade 2

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
2	100	16	23	15	8
2	101	16	23	15	8
2	102	16	23	15	8
2	103	16	23	15	8
2	104	16	23	15	8
2	105	16	23	15	8
2	106	16	23	15	8
2	107	16	23	15	8
2	108	16	23	15	8
2	109	16	23	15	8
2	110	16	23	15	8
2	111	16	23	15	8
2	112	16	23	15	8
2	113	16	23	15	8
2	114	16	23	15	8
2	115	16	23	15	8
2	116	16	23	15	8
2	117	16	23	15	8
2	118	16	23	15	8
2	119	16	23	15	8
2	120	16	23	15	8
2	121	15	23	15	8
2	122	15	22	15	8
2	123	15	22	15	8
2	124	15	22	15	8
2	125	15	22	15	8
2	126	15	22	15	8
2	127	15	22	15	7
2	128	15	21	15	7
2	129	15	21	15	7
2	130	14	21	15	7
2	131	14	21	15	7
2	132	14	21	15	7

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
2	133	14	21	15	7
2	134	14	20	15	7
2	135	14	20	15	7
2	136	14	20	15	7
2	137	14	20	15	7
2	138	14	20	15	7
2	139	13	20	14	7
2	140	13	20	14	7
2	141	13	19	14	7
2	142	13	19	14	7
2	143	13	19	14	7
2	144	13	19	14	7
2	145	13	19	14	7
2	146	13	19	14	6
2	147	13	18	14	6
2	148	12	18	14	6
2	149	12	18	14	6
2	150	12	18	14	6
2	151	12	18	14	6
2	152	12	18	14	6
2	153	12	17	14	6
2	154	12	17	14	6
2	155	12	17	14	6
2	156	12	17	14	6
2	157	11	17	14	6
2	158	11	17	14	6
2	159	11	16	14	6
2	160	11	16	14	6
2	161	11	16	14	6
2	162	11	16	14	6
2	163	11	16	14	6
2	164	11	16	14	6
2	165	11	16	14	6
2	166	10	15	14	5
2	167	10	15	14	5
2	168	10	15	14	5
2	169	10	15	14	5
2	170	10	15	14	5
2	171	10	15	14	5
2	172	10	14	14	5
2	173	10	14	14	5
2	174	10	14	14	5
2	175	9	14	14	5
2	176	9	14	14	5

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
2	177	9	14	14	5
2	178	9	13	14	5
2	179	9	13	14	5
2	180	9	13	14	5
2	181	9	13	14	5
2	182	9	13	13	5
2	183	9	13	13	5
2	184	8	12	13	5
2	185	8	12	13	4
2	186	8	12	13	4
2	187	8	12	13	4
2	188	8	12	13	4
2	189	8	12	13	4
2	190	8	12	13	4
2	191	8	11	13	4
2	192	8	11	13	4
2	193	7	11	13	4
2	194	7	11	13	4
2	195	7	11	13	4
2	196	7	11	13	4
2	197	7	10	13	4
2	198	7	10	13	4
2	199	7	10	13	4
2	200	7	10	13	4
2	201	7	10	13	4
2	202	6	10	13	4
2	203	6	9	13	4
2	204	6	9	13	4
2	205	6	9	13	3
2	206	6	9	13	3
2	207	6	9	13	3
2	208	6	9	13	3
2	209	6	9	13	3
2	210	6	8	13	3

Table A.4. MAP Growth Student Growth Projection—Grade 3

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
3	100	15	21	15	8
3	101	15	21	15	8
3	102	15	21	15	8
3	103	15	21	15	8
3	104	15	21	15	8
3	105	15	21	15	8
3	106	15	21	15	8

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
3	107	15	21	15	8
3	108	15	21	15	8
3	109	15	21	15	8
3	110	15	21	15	8
3	111	15	21	15	8
3	112	15	21	15	8
3	113	15	21	15	8
3	114	15	21	15	8
3	115	15	21	15	8
3	116	15	21	15	8
3	117	15	21	15	8
3	118	15	21	15	8
3	119	15	21	15	8
3	120	15	21	15	8
3	121	15	21	15	8
3	122	15	21	15	8
3	123	15	21	15	8
3	124	14	21	15	8
3	125	14	21	15	8
3	126	14	20	15	8
3	127	14	20	15	7
3	128	14	20	15	7
3	129	14	20	15	7
3	130	14	20	15	7
3	131	14	20	14	7
3	132	14	19	14	7
3	133	13	19	14	7
3	134	13	19	14	7
3	135	13	19	14	7
3	136	13	19	14	7
3	137	13	19	14	7
3	138	13	18	14	7
3	139	13	18	14	7
3	140	13	18	14	7
3	141	13	18	14	7
3	142	12	18	14	6
3	143	12	18	14	6
3	144	12	17	13	6
3	145	12	17	13	6
3	146	12	17	13	6
3	147	12	17	13	6
3	148	12	17	13	6
3	149	12	17	13	6
3	150	12	16	13	6

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
3	151	11	16	13	6
3	152	11	16	13	6
3	153	11	16	13	6
3	154	11	16	13	6
3	155	11	16	13	6
3	156	11	16	12	6
3	157	11	15	12	6
3	158	11	15	12	5
3	159	11	15	12	5
3	160	10	15	12	5
3	161	10	15	12	5
3	162	10	15	12	5
3	163	10	14	12	5
3	164	10	14	12	5
3	165	10	14	12	5
3	166	10	14	12	5
3	167	10	14	12	5
3	168	10	14	12	5
3	169	9	13	11	5
3	170	9	13	11	5
3	171	9	13	11	5
3	172	9	13	11	5
3	173	9	13	11	4
3	174	9	13	11	4
3	175	9	12	11	4
3	176	9	12	11	4
3	177	9	12	11	4
3	178	8	12	11	4
3	179	8	12	11	4
3	180	8	12	11	4
3	181	8	12	10	4
3	182	8	11	10	4
3	183	8	11	10	4
3	184	8	11	10	4
3	185	8	11	10	4
3	186	8	11	10	4
3	187	7	11	10	4
3	188	7	10	10	4
3	189	7	10	10	3
3	190	7	10	10	3
3	191	7	10	10	3
3	192	7	10	10	3
3	193	7	10	10	3
3	194	7	9	9	3

Grade	Start RIT	Fall to Winter	Fall to Spring	Fall to Fall	Winter to Spring
3	195	7	9	9	3
3	196	6	9	9	3
3	197	6	9	9	3
3	198	6	9	9	3
3	199	6	9	9	3
3	200	6	8	9	3
3	201	6	8	9	3
3	202	6	8	9	3
3	203	6	8	9	3
3	204	6	8	9	2
3	205	5	8	9	2
3	206	5	7	9	2
3	207	5	7	8	2
3	208	5	7	8	2
3	209	5	7	8	2
3	210	5	7	8	2