

NORTH CAROLINA LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale
with the North Carolina State End of Grade (EOG) Testing
Program

March 2014

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A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE NORTH CAROLINA STATE END OF GRADE (EOG) TESTING PROGRAM

NOVEMBER 2013

Recently, NWEA completed a study to connect the scale of the North Carolina State End of Grade (EOG) Testing Program used for North Carolina’s mathematics and reading assessments with NWEA’s RIT scale. Information from the state assessments was used in a study to establish performance-level scores on the RIT scale that would indicate a good chance of success on these tests.

To perform the analysis, we linked together state test and NWEA test results for a sample of 18,730 North Carolina students who completed both exams in the spring of 2013, the term in which the EOG is administered. For the spring season (labeled “current season”), an Equipercentile method was used to estimate the RIT score equivalent to each state performance level. For fall (labeled “prior season”), we determined the percentage of the population within the selected study group that performed at each level on the state test and found the equivalent percentile ranges within the NWEA dataset to estimate the cut scores. For example, if 40% of the study group population in grade 3 mathematics performed below the proficient level on the state test, we would find the RIT score that would be equivalent to the 40th percentile for the study population (this would not be the same as the 40th percentile in the NWEA norms). This RIT score would be the estimated point on the NWEA RIT scale that would be equivalent to the minimum score for proficiency on the state test. Documentation about this method can be found on our website.

Table Sets 1 and 2 show the best estimate of the minimum RIT equivalent to each state performance level for same-season (spring) and prior-season (fall) RIT scores. These tables can be used to identify students who may need additional help to perform well on these tests.

Table Sets 3 and 4 show the estimated probability of a student receiving a proficient score on the state assessment, based on that student’s RIT score. These tables can be used to assist in identifying students who are not likely to pass these assessments, thereby increasing the probability that intervention strategies will be planned and implemented. These tables can also be useful for identifying target RIT-score objectives likely to correspond to successful or “proficient” performance on the state test.

Table 5 shows the correlation coefficients between MAP and the state test in each grade. These statistics show the degree to which MAP and the state test are linearly related, with values at or near 1.0 suggesting a perfect linear relationship, and values near 0.0 indicating no linear relationship. Table 6 shows the percentages of students at each grade and within each subject whose status on the state test (i.e., whether or not the student “met standards”) was accurately predicted by their MAP performance and using the estimated cut scores within the current study. This table can be used to understand the predictive validity of MAP with respect to the EOG.

TABLE SET 1 – MINIMUM ESTIMATED SAME-SEASON (SPRING) RIT CUT SCORES
CORRESPONDING TO STATE PERFORMANCE LEVELS

MATH - Current Season									
Cut Scores and %tiles for each State Performance Level									
Grade	Level 1	Level 2		Level 3		Level 4		Level 5	
	Cut Score	Cut Score	%tile						
2	<180	180	18	187	38	191	50	202	80
3	<191	191	18	199	38	203	50	214	80
4	<203	203	25	213	51	215	57	227	85
5	<210	210	23	221	50	223	55	237	86
6	<218	218	32	227	53	229	58	241	83
7	<223	223	33	233	56	235	60	247	83
8	<226	226	32	238	58	241	64	256	89

READING - Current Season									
Cut Scores and %tiles for each State Performance Level									
Grade	Level 1	Level 2		Level 3		Level 4		Level 5	
	Cut Score	Cut Score	%tile						
2	<177	177	20	187	44	191	55	206	86
3	<187	187	20	197	44	201	55	215	86
4	<197	197	25	206	48	209	56	226	91
5	<203	203	26	212	49	216	60	230	89
6	<202	202	16	214	43	217	52	230	82
7	<205	205	15	216	40	220	51	235	86
8	<209	209	18	221	46	225	57	240	88

* Note: the cut scores shown in this table are the **minimum** estimated scores. Meeting the minimum MAP cut score corresponds to a 50% probability of achieving that performance level. Use the probabilities in Table Set 3 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data. Level 3 has been designated by the State as demonstrating “sufficient command of grade level knowledge”, but “are not yet on track for college-and-career readiness without additional academic support”.

TABLE SET 2 – MINIMUM ESTIMATED PRIOR-SEASON (FALL) RIT CUT SCORES
CORRESPONDING TO STATE PERFORMANCE LEVELS

MATH - Prior Season									
Cut Scores and %tiles for each State Performance Level									
Grade	Level 1	Level 2		Level 3		Level 4		Level 5	
	Cut Score	Cut Score	%tile						
2	<166	166	17	174	37	178	49	189	80
3	<180	180	17	188	37	192	50	202	78
4	<195	195	25	204	51	206	57	217	84
5	<202	202	22	213	50	214	53	228	86
6	<212	212	31	220	51	222	56	234	83
7	<218	218	33	228	56	230	60	241	82
8	<222	222	32	233	57	236	63	251	89

READING - Prior Season									
Cut Scores and %tiles for each State Performance Level									
Grade	Level 1	Level 2		Level 3		Level 4		Level 5	
	Cut Score	Cut Score	%tile						
2	<163	163	20	173	43	178	55	192	85
3	<177	177	19	187	42	191	53	206	86
4	<190	190	25	199	48	202	56	219	91
5	<198	198	26	206	47	210	58	224	88
6	<198	198	16	209	41	213	52	225	81
7	<201	201	14	212	38	216	49	231	85
8	<205	205	17	217	44	222	57	237	88

* Note: the cut scores shown in this table are the **minimum** estimated scores. Meeting the minimum MAP cut score corresponds to a 50% probability of achieving that performance level. Use the probabilities in Table Set 4 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data. Level 3 has been designated by the State as demonstrating “sufficient command of grade level knowledge”, but “are not yet on track for college-and-career readiness without additional academic support”.

TABLE SET 3 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE TEST IN SAME SEASON (SPRING), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP ASSESSMENT

MATH - Spring Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	0%	0%	0%	0%	0%	0%	0%
125	0%	0%	0%	0%	0%	0%	0%
130	0%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%
140	1%	0%	0%	0%	0%	0%	0%
145	1%	0%	0%	0%	0%	0%	0%
150	2%	1%	0%	0%	0%	0%	0%
155	4%	1%	0%	0%	0%	0%	0%
160	6%	2%	0%	0%	0%	0%	0%
165	10%	3%	1%	0%	0%	0%	0%
170	15%	5%	1%	1%	0%	0%	0%
175	23%	8%	2%	1%	1%	0%	0%
180	33%	13%	4%	2%	1%	0%	0%
185	45%	20%	6%	3%	1%	1%	0%
190	57%	29%	9%	4%	2%	1%	1%
195	69%	40%	14%	7%	4%	2%	1%
200	79%	52%	21%	11%	6%	4%	2%
205	86%	65%	31%	17%	10%	6%	4%
210	91%	75%	43%	25%	15%	9%	6%
215	94%	83%	55%	35%	23%	14%	9%
220	96%	89%	67%	48%	33%	21%	14%
225	98%	93%	77%	60%	45%	31%	21%
230	99%	96%	85%	71%	57%	43%	31%
235	99%	97%	90%	80%	69%	55%	43%
240	100%	98%	94%	87%	79%	67%	55%
245	100%	99%	96%	92%	86%	77%	67%
250	100%	99%	98%	95%	91%	85%	77%
255	100%	100%	99%	97%	94%	90%	85%
260	100%	100%	99%	98%	96%	94%	90%
265	100%	100%	99%	99%	98%	96%	94%
270	100%	100%	100%	99%	99%	98%	96%
275	100%	100%	100%	100%	99%	99%	98%
280	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	99%	99%
290	100%	100%	100%	100%	100%	100%	99%
295	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%

*Note: This table provides the estimated probability of meeting Performance Level 3 on the state test based on a MAP test score taken during that same (spring) season. Example: if a fifth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the state test is 11%.

Italics represent extrapolated data.

READING - Spring Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	0%	0%	0%	0%	0%	0%	0%
125	0%	0%	0%	0%	0%	0%	0%
130	0%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%
140	1%	0%	0%	0%	0%	0%	0%
145	1%	1%	0%	0%	0%	0%	0%
150	2%	1%	0%	0%	0%	0%	0%
155	4%	1%	1%	0%	0%	0%	0%
160	6%	2%	1%	1%	0%	0%	0%
165	10%	4%	2%	1%	1%	1%	0%
170	15%	6%	3%	1%	1%	1%	1%
175	23%	10%	4%	2%	2%	2%	1%
180	33%	15%	7%	4%	3%	3%	2%
185	45%	23%	11%	6%	5%	4%	3%
190	57%	33%	17%	10%	8%	7%	4%
195	69%	45%	25%	15%	13%	11%	7%
200	79%	57%	35%	23%	20%	17%	11%
205	86%	69%	48%	33%	29%	25%	17%
210	91%	79%	60%	45%	40%	35%	25%
215	94%	86%	71%	57%	52%	48%	35%
220	96%	91%	80%	69%	65%	60%	48%
225	98%	94%	87%	79%	75%	71%	60%
230	99%	96%	92%	86%	83%	80%	71%
235	99%	98%	95%	91%	89%	87%	80%
240	100%	99%	97%	94%	93%	92%	87%
245	100%	99%	98%	96%	96%	95%	92%
250	100%	100%	99%	98%	97%	97%	95%
255	100%	100%	99%	99%	98%	98%	97%
260	100%	100%	100%	99%	99%	99%	98%
265	100%	100%	100%	100%	99%	99%	99%
270	100%	100%	100%	100%	100%	100%	99%
275	100%	100%	100%	100%	100%	100%	100%
280	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	100%	100%	100%	100%
295	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%

*Note: This table provides the estimated probability of meeting Performance Level 3 on the state test based on a MAP test score taken during that same (spring) season. Example: if a fifth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the state test is 23%.

Italics represent extrapolated data.

TABLE SET 4 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE TEST IN PRIOR SEASON (FALL), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP

MATH - Fall Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	0%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%	0%
135	2%	0%	0%	0%	0%	0%	0%
140	3%	1%	0%	0%	0%	0%	0%
145	5%	1%	0%	0%	0%	0%	0%
150	8%	2%	0%	0%	0%	0%	0%
155	13%	4%	1%	0%	0%	0%	0%
160	20%	6%	1%	0%	0%	0%	0%
165	29%	9%	2%	1%	0%	0%	0%
170	40%	14%	3%	1%	1%	0%	0%
175	52%	21%	5%	2%	1%	0%	0%
180	65%	31%	8%	4%	2%	1%	0%
185	75%	43%	13%	6%	3%	1%	1%
190	83%	55%	20%	9%	5%	2%	1%
195	89%	67%	29%	14%	8%	4%	2%
200	93%	77%	40%	21%	12%	6%	4%
205	96%	85%	52%	31%	18%	9%	6%
210	97%	90%	65%	43%	27%	14%	9%
215	98%	94%	75%	55%	38%	21%	14%
220	99%	96%	83%	67%	50%	31%	21%
225	99%	98%	89%	77%	62%	43%	31%
230	100%	99%	93%	85%	73%	55%	43%
235	100%	99%	96%	90%	82%	67%	55%
240	100%	99%	97%	94%	88%	77%	67%
245	100%	100%	98%	96%	92%	85%	77%
250	100%	100%	99%	98%	95%	90%	85%
255	100%	100%	99%	99%	97%	94%	90%
260	100%	100%	100%	99%	98%	96%	94%
265	100%	100%	100%	99%	99%	98%	96%
270	100%	100%	100%	100%	99%	99%	98%
275	100%	100%	100%	100%	100%	99%	99%
280	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	100%	99%
290	100%	100%	100%	100%	100%	100%	100%
295	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%

*Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that prior (fall) season. Example: if a fifth grade student scored 200 on a MAP test taken during the fall season, her/his estimated probability of passing the state test is 21%.

Italics represent extrapolated data.

READING - Fall Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	0%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%	0%
135	2%	1%	0%	0%	0%	0%	0%
140	4%	1%	0%	0%	0%	0%	0%
145	6%	1%	0%	0%	0%	0%	0%
150	9%	2%	1%	0%	0%	0%	0%
155	14%	4%	1%	1%	0%	0%	0%
160	21%	6%	2%	1%	1%	1%	0%
165	31%	10%	3%	2%	1%	1%	1%
170	43%	15%	5%	3%	2%	1%	1%
175	55%	23%	8%	4%	3%	2%	1%
180	67%	33%	13%	7%	5%	4%	2%
185	77%	45%	20%	11%	8%	6%	4%
190	85%	57%	29%	17%	13%	10%	6%
195	90%	69%	40%	25%	20%	15%	10%
200	94%	79%	52%	35%	29%	23%	15%
205	96%	86%	65%	48%	40%	33%	23%
210	98%	91%	75%	60%	52%	45%	33%
215	99%	94%	83%	71%	65%	57%	45%
220	99%	96%	89%	80%	75%	69%	57%
225	99%	98%	93%	87%	83%	79%	69%
230	100%	99%	96%	92%	89%	86%	79%
235	100%	99%	97%	95%	93%	91%	86%
240	100%	100%	98%	97%	96%	94%	91%
245	100%	100%	99%	98%	97%	96%	94%
250	100%	100%	99%	99%	98%	98%	96%
255	100%	100%	100%	99%	99%	99%	98%
260	100%	100%	100%	100%	99%	99%	99%
265	100%	100%	100%	100%	100%	100%	99%
270	100%	100%	100%	100%	100%	100%	100%
275	100%	100%	100%	100%	100%	100%	100%
280	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	100%	100%	100%	100%
295	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%

*Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that prior (fall) season. Example: if a fifth grade student scored 200 on a MAP test taken during the fall season, her/his estimated probability of passing the state test is 35%.

Italics represent extrapolated data.

TABLE 5 – CORRELATION COEFFICIENTS BETWEEN MAP AND STATE TEST FOR EACH GRADE AND TEST SUBJECT

Grade	Math Correlation Pearson's r	Reading Correlation Pearson's r
3	0.814	0.821
4	0.843	0.792
5	0.852	0.803
6	0.844	0.783
7	0.856	0.770
8	0.839	0.775

* Note: Correlations range from 0 (indicating no correlation between the state test score and the NWEA test score) to 1 (indicating complete correlation between the state test score and the NWEA test score).

TABLE 6 – PERCENTAGE OF STUDENTS WHOSE PASS STATUS WAS ACCURATELY PREDICTED BY THEIR MAP PERFORMANCE USING REPORTED CUT SCORES

Grade	Sample Size	MAP Accurately Predicted State Performance	MAP Underestimated State Performance	MAP Overestimated State Performance
Mathematics				
3	6675	82.7%	8.4%	9.0%
4	7179	85.5%	7.2%	7.3%
5	6962	85.7%	6.6%	7.6%
6	4745	84.8%	8.1%	7.1%
7	4689	86.1%	7.3%	6.6%
8	4625	85.6%	6.8%	7.5%
Reading				
3	6649	83.0%	8.0%	8.9%
4	7258	81.9%	9.2%	8.9%
5	7037	81.5%	8.5%	10.0%
6	4779	81.9%	9.6%	8.5%
7	4650	81.7%	9.0%	9.3%
8	4541	81.4%	9.6%	9.1%

*Note: The third column of this table shows the percentage of students whose Pass/NotPass status was predicted accurately when their state test score was linked to their MAP score based on this linking study. The fourth column shows the percentage of students whose MAP score predicted they would not pass the state benchmark but they did pass. The last column shows the percentage of students whose MAP score predicted they would pass the state benchmark but they did not pass. Due to rounding, percentages may not add to 100%.