

Wisconsin LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale with the
Wisconsin Knowledge and Concepts Examination

May 2010

The Kingsbury Center at Northwest Evaluation Association



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A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE WISCONSIN KNOWLEDGE AND CONCEPTS EXAMINATION

KINGSBURY CENTER AT NWEA

MARCH 2010

Recently, NWEA completed a project to connect the scale of Wisconsin Knowledge and Concepts Examination (WKCE) 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 22,839 Wisconsin students from 83 schools who completed both exams in the fall of 2008. The Wisconsin state test is administered in fall. For the spring season, an equipercentile method was used to estimate the RIT score equivalent to each state performance level. For spring, 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.

Tables 1 through 4 show the best estimate of the minimum RIT equivalent to each state performance level for same-season (fall) and prior-season (spring of the prior year) RIT scores. These tables can be used to identify students who may need additional help to perform well on these tests.

Tables 5 through 8 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 9 shows the correlation coefficients between MAP and the state test for reading and mathematics at each of the grades 3 through 8. 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 10 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 Wisconsin state tests.

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

MATH-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<i><169</i>	169	15	172	24	182	64
3	<180	180	15	184	24	197	64
4	<188	188	12	194	22	207	61
5	<197	197	13	202	22	213	53
6	<203	203	15	209	25	224	63
7	<205	205	12	213	23	232	67
8	<206	206	10	218	24	240	72

* 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 Tables 5-8 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data.

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

READING-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<i><156</i>	156	0	165	14	180	52
3	<161	161	0	177	14	193	52
4	<167	167	2	186	15	203	54
5	<178	178	3	195	18	211	59
6	<188	188	6	200	18	215	56
7	<189	189	5	201	14	219	56
8	<196	196	7	207	17	224	60

* 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 Tables 5-8 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data.

TABLE 3 – MINIMUM ESTIMATED PRIOR-SEASON (SPRING) RIT CUT SCORES
CORRESPONDING TO STATE PERFORMANCE LEVELS – MATHEMATICS

MATH-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2 in Spring (3 in Fall)	<178	178	14	182	23	195	62
3 in Spring (4 in Fall)	<188	188	12	193	21	206	60
4 in Spring (5 in Fall)	<196	196	13	201	21	213	53
5 in Spring (6 in Fall)	<204	204	15	209	24	225	62
6 in Spring (7 in Fall)	<205	205	12	212	22	232	67
7 in Spring (8 in Fall)	<206	206	10	217	24	239	72

*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 Tables 5-8 to determine the appropriate ‘target’ scores for a desired level of certainty. Use the lookup row for grade the student will be in when he/she takes the state test. For example, the minimum MAP score associated with 3rd grade proficiency during the prior season (when the student was in second grade) is 182.

TABLE 4 – MINIMUM ESTIMATED PRIOR-SEASON (SPRING) RIT CUT SCORES
CORRESPONDING TO STATE PERFORMANCE LEVELS – READING

READING-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2 in Spring (3 in Fall)	<160	160	1	175	14	191	51
3 in Spring (4 in Fall)	<169	169	2	185	15	201	52
4 in Spring (5 in Fall)	<177	177	3	194	18	210	58
5 in Spring (6 in Fall)	<188	188	6	200	18	214	54
6 in Spring (7 in Fall)	<189	189	5	200	14	218	55
7 in Spring (8 in Fall)	<195	195	7	205	16	223	60

*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 Tables 5-8 to determine the appropriate ‘target’ scores for a desired level of certainty. Use the lookup row for grade the student will be in when he/she takes the state test. For example, the minimum MAP score associated with 3rd grade proficiency during the prior season (when the student was in second grade) is 175.

TABLE 5 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE MATHEMATICS TEST IN SAME SEASON (FALL), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP MATHEMATICS

MATH-Current Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	1%	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%	2%	1%	0%	0%	0%	0%
150	10%	3%	1%	1%	0%	0%	0%
155	15%	5%	2%	1%	0%	0%	0%
160	23%	8%	3%	1%	1%	0%	0%
165	33%	13%	5%	2%	1%	1%	0%
170	45%	20%	8%	4%	2%	1%	1%
175	57%	29%	13%	6%	3%	2%	1%
180	69%	40%	20%	10%	5%	4%	2%
185	79%	52%	29%	15%	8%	6%	4%
190	86%	65%	40%	23%	13%	9%	6%
195	91%	75%	52%	33%	20%	14%	9%
200	94%	83%	65%	45%	29%	21%	14%
205	96%	89%	75%	57%	40%	31%	21%
210	98%	93%	83%	69%	52%	43%	31%
215	99%	96%	89%	79%	65%	55%	43%
220	99%	97%	93%	86%	75%	67%	55%
225	100%	98%	96%	91%	83%	77%	67%
230	100%	99%	97%	94%	89%	85%	77%
235	100%	99%	98%	96%	93%	90%	85%
240	100%	100%	99%	98%	96%	94%	90%
245	100%	100%	99%	99%	97%	96%	94%
250	100%	100%	100%	99%	98%	98%	96%
255	100%	100%	100%	100%	99%	99%	98%
260	100%	100%	100%	100%	99%	99%	99%
265	100%	100%	100%	100%	100%	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 passing the state test based on a MAP test score taken during that same (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 45%.

Italics represent extrapolated data.

TABLE 6 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE READING TEST IN SAME SEASON (FALL), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP READING

READING-Current Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
RIT Range	2	3	4	5	6	7	8
120	1%	0%	0%	0%	0%	0%	0%
125	2%	1%	0%	0%	0%	0%	0%
130	3%	1%	0%	0%	0%	0%	0%
135	5%	1%	1%	0%	0%	0%	0%
140	8%	2%	1%	0%	0%	0%	0%
145	12%	4%	2%	1%	0%	0%	0%
150	18%	6%	3%	1%	1%	1%	0%
155	27%	10%	4%	2%	1%	1%	1%
160	38%	15%	7%	3%	2%	2%	1%
165	50%	23%	11%	5%	3%	3%	1%
170	62%	33%	17%	8%	5%	4%	2%
175	73%	45%	25%	12%	8%	7%	4%
180	82%	57%	35%	18%	12%	11%	6%
185	88%	69%	48%	27%	18%	17%	10%
190	92%	79%	60%	38%	27%	25%	15%
195	95%	86%	71%	50%	38%	35%	23%
200	97%	91%	80%	62%	50%	48%	33%
205	98%	94%	87%	73%	62%	60%	45%
210	99%	96%	92%	82%	73%	71%	57%
215	99%	98%	95%	88%	82%	80%	69%
220	100%	99%	97%	92%	88%	87%	79%
225	100%	99%	98%	95%	92%	92%	86%
230	100%	100%	99%	97%	95%	95%	91%
235	100%	100%	99%	98%	97%	97%	94%
240	100%	100%	100%	99%	98%	98%	96%
245	100%	100%	100%	99%	99%	99%	98%
250	100%	100%	100%	100%	99%	99%	99%
255	100%	100%	100%	100%	100%	100%	99%
260	100%	100%	100%	100%	100%	100%	100%
265	100%	100%	100%	100%	100%	100%	100%
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 same (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 62%.

Italics represent extrapolated data.

TABLE 7 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE MATHEMATICS TEST IN PRIOR SEASON (SPRING), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP MATHEMATICS

MATH-Prior Season						
Estimated Probability of Passing State Test Based on Observed MAP Score						
RIT Range	2	3	4	5	6	7
120	0%	0%	0%	0%	0%	0%
125	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%
140	1%	0%	0%	0%	0%	0%
145	2%	1%	0%	0%	0%	0%
150	4%	1%	1%	0%	0%	0%
155	6%	2%	1%	0%	0%	0%
160	10%	4%	2%	1%	1%	0%
165	15%	6%	3%	1%	1%	1%
170	23%	9%	4%	2%	1%	1%
175	33%	14%	7%	3%	2%	1%
180	45%	21%	11%	5%	4%	2%
185	57%	31%	17%	8%	6%	4%
190	69%	43%	25%	13%	10%	6%
195	79%	55%	35%	20%	15%	10%
200	86%	67%	48%	29%	23%	15%
205	91%	77%	60%	40%	33%	23%
210	94%	85%	71%	52%	45%	33%
215	96%	90%	80%	65%	57%	45%
220	98%	94%	87%	75%	69%	57%
225	99%	96%	92%	83%	79%	69%
230	99%	98%	95%	89%	86%	79%
235	100%	99%	97%	93%	91%	86%
240	100%	99%	98%	96%	94%	91%
245	100%	99%	99%	97%	96%	94%
250	100%	100%	99%	98%	98%	96%
255	100%	100%	100%	99%	99%	98%
260	100%	100%	100%	99%	99%	99%
265	100%	100%	100%	100%	100%	99%
270	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 the previous spring season, when the student was in her/his prior grade. Example: if a fourth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the 5th grade fall state test is 48%.

TABLE 8 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE READING TEST IN PRIOR SEASON (SPRING), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP READING

READING-Prior Season						
Estimated Probability of Passing State Test Based on Observed MAP Score						
RIT Range	2	3	4	5	6	7
125	1%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%
135	2%	1%	0%	0%	0%	0%
140	3%	1%	0%	0%	0%	0%
145	5%	2%	1%	0%	0%	0%
150	8%	3%	1%	1%	1%	0%
155	12%	5%	2%	1%	1%	1%
160	18%	8%	3%	2%	2%	1%
165	27%	12%	5%	3%	3%	2%
170	38%	18%	8%	5%	5%	3%
175	50%	27%	13%	8%	8%	5%
180	62%	38%	20%	12%	12%	8%
185	73%	50%	29%	18%	18%	12%
190	82%	62%	40%	27%	27%	18%
195	88%	73%	52%	38%	38%	27%
200	92%	82%	65%	50%	50%	38%
205	95%	88%	75%	62%	62%	50%
210	97%	92%	83%	73%	73%	62%
215	98%	95%	89%	82%	82%	73%
220	99%	97%	93%	88%	88%	82%
225	99%	98%	96%	92%	92%	88%
230	100%	99%	97%	95%	95%	92%
235	100%	99%	98%	97%	97%	95%
240	100%	100%	99%	98%	98%	97%
245	100%	100%	99%	99%	99%	98%
250	100%	100%	100%	99%	99%	99%
255	100%	100%	100%	100%	100%	99%
260	100%	100%	100%	100%	100%	100%
265	100%	100%	100%	100%	100%	100%
270	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 the previous spring season, when the student was in her/his prior grade. Example: if a fourth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the 5th grade fall state test is 65%.

TABLE 9 – CORRELATION COEFFICIENTS BETWEEN MAP AND STATE TEST FOR EACH GRADE AND TEST SUBJECT

Grade	Math Correlation Pearson's <i>r</i>	Reading Correlation Pearson's <i>r</i>
3	0.792	0.784
4	0.790	0.818
5	0.831	0.808
6	0.860	0.815
7	0.863	0.798
8	0.871	0.808

* 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 10 – 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	3904	86.83%	5.56%	7.61%
4	3738	87.51%	6.23%	6.26%
5	3915	87.56%	6.18%	6.26%
6	3793	88.95%	5.27%	5.77%
7	3847	89.47%	4.60%	5.93%
8	3642	89.62%	4.39%	5.99%
Reading				
3	3884	88.70%	5.51%	5.79%
4	3748	88.69%	5.52%	5.79%
5	3905	88.35%	6.04%	5.61%
6	3787	90.23%	4.20%	5.57%
7	3831	90.52%	4.05%	5.43%
8	3625	89.74%	4.97%	5.30%

* 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%.



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