WISCONSIN LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale
with Wisconsin's Knowledge and Concepts Exam (WKCE)

August 2012

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A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE WISCONSIN KNOWLEDGE AND CONCEPTS EXAM (WKCE)

Recently, NWEA completed a project to connect the scale of Wisconsin's Knowledge and Concepts Exam (WKCE) used for Wisconsin's math 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 21,608 Wisconsin students from at least 58 schools who completed both exams in the fall of 2008. The Wisconsin state test is administered in the fall. For the fall 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 WKCE.

MATH - Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal Performance	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<165	165	15	180	56	195	90
3	<179	179	15	194	56	208	90
4	<189	189	13	204	51	220	89
5	<198	198	15	212	47	229	87
6	<206	206	19	222	56	238	88
7	<212	212	21	227	53	243	85
8	<217	217	22	235	61	252	90
READING - Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Minimal Performance	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<168	168	32	183	68	196	90
3	<183	183	32	197	68	209	90
4	<194	194	34	206	67	217	89
5	<200	200	31	212	63	225	90
6	<206	206	33	218	65	232	91
7	<208	208	28	222	66	236	92
8	<210	210	27	227	70	242	94

*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.

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Grade	Minimal Performance Cut Score	Basic		Proficient		Advanced	
MATH – Prior Season							
Cut Scores and Percentiles for each State Performance Level							
		Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<166	166	15	181	56	195	90
3	<178	178	14	193	55	207	89
4	<188	188	12	203	50	219	89
5	<198	198	15	211	46	228	86
6	<208	208	19	223	55	238	87
7	<212	212	20	227	53	242	85
8	<217	217	22	235	60	253	90
READING – Prior Season							
Cut Scores and Percentiles for each State Performance Level							
		Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<170	170	32	183	66	196	90
3	<182	182	30	196	67	209	90
4	<193	193	33	205	66	217	89
5	<199	199	29	211	62	225	90
6	<206	206	33	217	63	231	91
7	<208	208	28	222	65	237	92
8	<211	211	27	227	69	242	94

[*]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.

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

MATH - Current 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	1%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%
140	2%	0%	0%	0%	0%	0%	0%
145	3%	1%	0%	0%	0%	0%	0%
150	5%	1%	0%	0%	0%	0%	0%
155	8%	2%	1%	0%	0%	0%	0%
160	12%	3%	1%	1%	0%	0%	0%
165	18%	5%	2%	1%	0%	0%	0%
170	27%	8%	3%	1%	1%	0%	0%
175	38%	13%	5%	2%	1%	1%	0%
180	50%	20%	8%	4%	1%	1%	0%
185	62%	29%	13%	6%	2%	1%	1%
190	73%	40%	20%	10%	4%	2%	1%
195	82%	52%	29%	15%	6%	4%	2%
200	88%	65%	40%	23%	10%	6%	3%
205	92%	75%	52%	33%	15%	10%	5%
210	95%	83%	65%	45%	23%	15%	8%
215	97%	89%	75%	57%	33%	23%	12%
220	98%	93%	83%	69%	45%	33%	18%
225	99%	96%	89%	79%	57%	45%	27%
230	99%	97%	93%	86%	69%	57%	38%
235	100%	98%	96%	91%	79%	69%	50%
240	100%	99%	97%	94%	86%	79%	62%
245	100%	99%	98%	96%	91%	86%	73%
250	100%	100%	99%	98%	94%	91%	82%
255	100%	100%	99%	99%	96%	94%	88%
260	100%	100%	100%	99%	98%	96%	92%
265	100%	100%	100%	100%	99%	98%	95%
270	100%	100%	100%	100%	99%	99%	97%
275	100%	100%	100%	100%	100%	99%	98%
280	100%	100%	100%	100%	100%	100%	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 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 23%.

Italics represent extrapolated data.

READING - Current 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	2%	1%	0%	0%	0%	0%	0%
150	4%	1%	0%	0%	0%	0%	0%
155	6%	1%	1%	0%	0%	0%	0%
160	9%	2%	1%	1%	0%	0%	0%
165	14%	4%	2%	1%	0%	0%	0%
170	21%	6%	3%	1%	1%	1%	0%
175	31%	10%	4%	2%	1%	1%	1%
180	43%	15%	7%	4%	2%	1%	1%
185	55%	23%	11%	6%	4%	2%	1%
190	67%	33%	17%	10%	6%	4%	2%
195	77%	45%	25%	15%	9%	6%	4%
200	85%	57%	35%	23%	14%	10%	6%
205	90%	69%	48%	33%	21%	15%	10%
210	94%	79%	60%	45%	31%	23%	15%
215	96%	86%	71%	57%	43%	33%	23%
220	98%	91%	80%	69%	55%	45%	33%
225	99%	94%	87%	79%	67%	57%	45%
230	99%	96%	92%	86%	77%	69%	57%
235	99%	98%	95%	91%	85%	79%	69%
240	100%	99%	97%	94%	90%	86%	79%
245	100%	99%	98%	96%	94%	91%	86%
250	100%	100%	99%	98%	96%	94%	91%
255	100%	100%	99%	99%	98%	96%	94%
260	100%	100%	100%	99%	99%	98%	96%
265	100%	100%	100%	100%	99%	99%	98%
270	100%	100%	100%	100%	99%	99%	99%
275	100%	100%	100%	100%	100%	100%	99%
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 23%.

Italics represent extrapolated data.

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

MATH - Prior 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	1%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%
140	2%	0%	0%	0%	0%	0%	0%
145	3%	1%	0%	0%	0%	0%	0%
150	4%	1%	0%	0%	0%	0%	0%
155	7%	2%	1%	0%	0%	0%	0%
160	11%	4%	1%	1%	0%	0%	0%
165	17%	6%	2%	1%	0%	0%	0%
170	25%	9%	4%	2%	0%	0%	0%
175	35%	14%	6%	3%	1%	1%	0%
180	48%	21%	9%	4%	1%	1%	0%
185	60%	31%	14%	7%	2%	1%	1%
190	71%	43%	21%	11%	4%	2%	1%
195	80%	55%	31%	17%	6%	4%	2%
200	87%	67%	43%	25%	9%	6%	3%
205	92%	77%	55%	35%	14%	10%	5%
210	95%	85%	67%	48%	21%	15%	8%
215	97%	90%	77%	60%	31%	23%	12%
220	98%	94%	85%	71%	43%	33%	18%
225	99%	96%	90%	80%	55%	45%	27%
230	99%	98%	94%	87%	67%	57%	38%
235	100%	99%	96%	92%	77%	69%	50%
240	100%	99%	98%	95%	85%	79%	62%
245	100%	99%	99%	97%	90%	86%	73%
250	100%	100%	99%	98%	94%	91%	82%
255	100%	100%	99%	99%	96%	94%	88%
260	100%	100%	100%	99%	98%	96%	92%
265	100%	100%	100%	100%	99%	98%	95%
270	100%	100%	100%	100%	99%	99%	97%
275	100%	100%	100%	100%	99%	99%	98%
280	100%	100%	100%	100%	100%	100%	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 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 25%.

Italics represent extrapolated data.

READING - Prior 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	2%	1%	0%	0%	0%	0%	0%
150	4%	1%	0%	0%	0%	0%	0%
155	6%	2%	1%	0%	0%	0%	0%
160	9%	3%	1%	1%	0%	0%	0%
165	14%	4%	2%	1%	1%	0%	0%
170	21%	7%	3%	2%	1%	1%	0%
175	31%	11%	5%	3%	1%	1%	1%
180	43%	17%	8%	4%	2%	1%	1%
185	55%	25%	12%	7%	4%	2%	1%
190	67%	35%	18%	11%	6%	4%	2%
195	77%	48%	27%	17%	10%	6%	4%
200	85%	60%	38%	25%	15%	10%	6%
205	90%	71%	50%	35%	23%	15%	10%
210	94%	80%	62%	48%	33%	23%	15%
215	96%	87%	73%	60%	45%	33%	23%
220	98%	92%	82%	71%	57%	45%	33%
225	99%	95%	88%	80%	69%	57%	45%
230	99%	97%	92%	87%	79%	69%	57%
235	99%	98%	95%	92%	86%	79%	69%
240	100%	99%	97%	95%	91%	86%	79%
245	100%	99%	98%	97%	94%	91%	86%
250	100%	100%	99%	98%	96%	94%	91%
255	100%	100%	99%	99%	98%	96%	94%
260	100%	100%	100%	99%	99%	98%	96%
265	100%	100%	100%	100%	99%	99%	98%
270	100%	100%	100%	100%	100%	99%	99%
275	100%	100%	100%	100%	100%	100%	99%
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 25%.

Italics represent extrapolated data.

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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	0.792	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 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	3904	83.3%	7.9%	8.8%
4	3738	82.0%	7.0%	11.0%
5	3914	83.3%	8.0%	8.7%
6	3793	85.4%	6.4%	8.3%
7	3847	85.4%	6.4%	8.2%
8	3641	87.8%	5.8%	6.4%
Reading				
3	3884	83.3%	8.4%	8.3%
4	3748	83.2%	8.0%	8.8%
5	3904	82.4%	7.3%	10.3%
6	3787	82.6%	7.6%	9.8%
7	3831	82.7%	8.0%	9.3%
8	3624	82.3%	8.5%	9.2%

[*]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%.