

Iowa LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale
with the Iowa Test of Basic Skills for Iowa Students

August 2010

The Kingsbury Center at Northwest Evaluation Association



KINGSBURY
CENTER AT NWEA

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A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE ITBS FOR IOWA STUDENTS

KINGSBURY CENTER AT NWEA

AUGUST 2010

Recently, NWEA completed a project to connect the scale of the Iowa Test of Basic Skills (ITBS) 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 9883 Iowa students from 22 schools who completed both exams in the fall of 2007, 2008, or 2009. The Iowa state test can be administered in any season, but most students take the test in the Fall. For the Fall 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 4 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 in the 3rd grade for the year before (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) 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 math at each of the grades 3 through 11. 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 ITBS.

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	Low	Intermediate		High	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile
2	< <i>173</i>	<i>173</i>	27	187	77
3	<185	185	27	201	77
4	<196	196	26	210	71
5	<201	201	20	220	72
6	<211	211	29	230	78
7	<215	215	27	237	78
8	<222	222	31	244	80
9	<225	225	33	252	89
10	<232	232	39	258	91
11	<233	233	33	259	86

* 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	Low	Intermediate		High	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile
2	< <i>168</i>	<i>168</i>	22	191	79
3	<181	181	22	203	79
4	<190	190	22	211	78
5	<197	197	21	219	82
6	<208	208	35	226	86
7	<210	210	30	229	83
8	<213	213	29	232	82
9	<215	215	30	234	81
10	<220	220	34	238	84
11	<221	221	32	238	81

* 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 OF PRIOR YEAR) RIT CUT SCORES CORRESPONDING TO STATE PERFORMANCE LEVELS – MATHEMATICS

MATH-Prior Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Low	Intermediate		High	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile
2	NA	NA	NA	NA	NA
3	<183	183	25	200	77
4	<195	195	25	209	70
5	<200	200	19	220	72
6	<211	211	28	231	77
7	<215	215	27	236	76
8	<221	221	31	243	80
9	<226	226	32	253	89
10	<231	231	39	256	90
11	<231	231	33	257	86

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

READING-Prior Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Low	Intermediate		High	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile
2	NA	NA	NA	NA	NA
3	<179	179	21	201	79
4	<189	189	22	210	78
5	<196	196	21	218	82
6	<207	207	33	225	85
7	<209	209	29	228	83
8	<212	212	29	231	82
9	<216	216	30	234	81
10	<218	218	33	237	84
11	<221	221	32	238	80

* 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 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	9	10	11
130	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
135	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%
140	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%
145	6%	2%	1%	0%	0%	0%	0%	0%	0%	0%
150	9%	3%	1%	1%	0%	0%	0%	0%	0%	0%
155	14%	5%	2%	1%	0%	0%	0%	0%	0%	0%
160	21%	8%	3%	2%	1%	0%	0%	0%	0%	0%
165	31%	12%	4%	3%	1%	1%	0%	0%	0%	0%
170	43%	18%	7%	4%	2%	1%	1%	0%	0%	0%
175	55%	27%	11%	7%	3%	2%	1%	1%	0%	0%
180	67%	38%	17%	11%	4%	3%	1%	1%	1%	0%
185	77%	50%	25%	17%	7%	5%	2%	2%	1%	1%
190	85%	62%	35%	25%	11%	8%	4%	3%	1%	1%
195	90%	73%	48%	35%	17%	12%	6%	5%	2%	2%
200	94%	82%	60%	48%	25%	18%	10%	8%	4%	4%
205	96%	88%	71%	60%	35%	27%	15%	12%	6%	6%
210	98%	92%	80%	71%	48%	38%	23%	18%	10%	9%
215	99%	95%	87%	80%	60%	50%	33%	27%	15%	14%
220	99%	97%	92%	87%	71%	62%	45%	38%	23%	21%
225	99%	98%	95%	92%	80%	73%	57%	50%	33%	31%
230	100%	99%	97%	95%	87%	82%	69%	62%	45%	43%
235	100%	99%	98%	97%	92%	88%	79%	73%	57%	55%
240	100%	100%	99%	98%	95%	92%	86%	82%	69%	67%
245	100%	100%	99%	99%	97%	95%	91%	88%	79%	77%
250	100%	100%	100%	99%	98%	97%	94%	92%	86%	85%
255	100%	100%	100%	100%	99%	98%	96%	95%	91%	90%
260	100%	100%	100%	100%	99%	99%	98%	97%	94%	94%
265	100%	100%	100%	100%	100%	99%	99%	98%	96%	96%
270	100%	100%	100%	100%	100%	100%	99%	99%	98%	98%
275	100%	100%	100%	100%	100%	100%	100%	99%	99%	99%
280	100%	100%	100%	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
290	100%	100%	100%	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 48%.

Bold 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	9	10	11
130	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%
135	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%
140	6%	2%	1%	0%	0%	0%	0%	0%	0%	0%
145	9%	3%	1%	1%	0%	0%	0%	0%	0%	0%
150	14%	4%	2%	1%	0%	0%	0%	0%	0%	0%
155	21%	7%	3%	1%	0%	0%	0%	0%	0%	0%
160	31%	11%	5%	2%	1%	1%	0%	0%	0%	0%
165	43%	17%	8%	4%	1%	1%	1%	1%	0%	0%
170	55%	25%	12%	6%	2%	2%	1%	1%	1%	1%
175	67%	35%	18%	10%	4%	3%	2%	2%	1%	1%
180	77%	48%	27%	15%	6%	5%	4%	3%	2%	2%
185	85%	60%	38%	23%	9%	8%	6%	5%	3%	3%
190	90%	71%	50%	33%	14%	12%	9%	8%	5%	4%
195	94%	80%	62%	45%	21%	18%	14%	12%	8%	7%
200	96%	87%	73%	57%	31%	27%	21%	18%	12%	11%
205	98%	92%	82%	69%	43%	38%	31%	27%	18%	17%
210	99%	95%	88%	79%	55%	50%	43%	38%	27%	25%
215	99%	97%	92%	86%	67%	62%	55%	50%	38%	35%
220	99%	98%	95%	91%	77%	73%	67%	62%	50%	48%
225	100%	99%	97%	94%	85%	82%	77%	73%	62%	60%
230	100%	99%	98%	96%	90%	88%	85%	82%	73%	71%
235	100%	100%	99%	98%	94%	92%	90%	88%	82%	80%
240	100%	100%	99%	99%	96%	95%	94%	92%	88%	87%
245	100%	100%	100%	99%	98%	97%	96%	95%	92%	92%
250	100%	100%	100%	100%	99%	98%	98%	97%	95%	95%
255	100%	100%	100%	100%	99%	99%	99%	98%	97%	97%
260	100%	100%	100%	100%	99%	99%	99%	99%	98%	98%
265	100%	100%	100%	100%	100%	100%	99%	99%	99%	99%
270	100%	100%	100%	100%	100%	100%	100%	100%	99%	99%
275	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
280	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	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 57%.

Bold italics represent extrapolated data.

TABLE 7 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE MATHEMATICS TEST IN PRIOR SEASON (SPRING OF PRIOR YEAR), 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	8	9	10	11
130	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
135	100%	1%	0%	0%	0%	0%	0%	0%	0%	0%
140	100%	1%	0%	0%	0%	0%	0%	0%	0%	0%
145	100%	2%	1%	0%	0%	0%	0%	0%	0%	0%
150	100%	4%	1%	1%	0%	0%	0%	0%	0%	0%
155	100%	6%	2%	1%	0%	0%	0%	0%	0%	0%
160	100%	9%	3%	2%	1%	0%	0%	0%	0%	0%
165	100%	14%	5%	3%	1%	1%	0%	0%	0%	0%
170	100%	21%	8%	5%	2%	1%	1%	0%	0%	0%
175	100%	31%	12%	8%	3%	2%	1%	1%	0%	0%
180	100%	43%	18%	12%	4%	3%	2%	1%	1%	1%
185	100%	55%	27%	18%	7%	5%	3%	2%	1%	1%
190	100%	67%	38%	27%	11%	8%	4%	3%	2%	2%
195	100%	77%	50%	38%	17%	12%	7%	4%	3%	3%
200	100%	85%	62%	50%	25%	18%	11%	7%	4%	4%
205	100%	90%	73%	62%	35%	27%	17%	11%	7%	7%
210	100%	94%	82%	73%	48%	38%	25%	17%	11%	11%
215	100%	96%	88%	82%	60%	50%	35%	25%	17%	17%
220	100%	98%	92%	88%	71%	62%	48%	35%	25%	25%
225	100%	99%	95%	92%	80%	73%	60%	48%	35%	35%
230	100%	99%	97%	95%	87%	82%	71%	60%	48%	48%
235	100%	99%	98%	97%	92%	88%	80%	71%	60%	60%
240	100%	100%	99%	98%	95%	92%	87%	80%	71%	71%
245	100%	100%	99%	99%	97%	95%	92%	87%	80%	80%
250	100%	100%	100%	99%	98%	97%	95%	92%	87%	87%
255	100%	100%	100%	100%	99%	98%	97%	95%	92%	92%
260	100%	100%	100%	100%	99%	99%	98%	97%	95%	95%
265	100%	100%	100%	100%	100%	99%	99%	98%	97%	97%
270	100%	100%	100%	100%	100%	100%	99%	99%	98%	98%
275	100%	100%	100%	100%	100%	100%	100%	99%	99%	99%
280	100%	100%	100%	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	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 the Spring of the prior year. Example: if a 4th grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the 5th grade state test in the Fall is 50%.

Bold italics represent extrapolated data.

TABLE 8 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE READING TEST IN PRIOR SEASON (SPRING OF PRIOR YEAR), 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	8	9	10	11
130	100%	1%	0%	0%	0%	0%	0%	0%	0%	0%
135	100%	1%	0%	0%	0%	0%	0%	0%	0%	0%
140	100%	2%	1%	0%	0%	0%	0%	0%	0%	0%
145	100%	3%	1%	1%	0%	0%	0%	0%	0%	0%
150	100%	5%	2%	1%	0%	0%	0%	0%	0%	0%
155	100%	8%	3%	2%	1%	0%	0%	0%	0%	0%
160	100%	13%	5%	3%	1%	1%	1%	0%	0%	0%
165	100%	20%	8%	4%	1%	1%	1%	1%	0%	0%
170	100%	29%	13%	7%	2%	2%	1%	1%	1%	1%
175	100%	40%	20%	11%	4%	3%	2%	2%	1%	1%
180	100%	52%	29%	17%	6%	5%	4%	3%	2%	2%
185	100%	65%	40%	25%	10%	8%	6%	4%	4%	3%
190	100%	75%	52%	35%	15%	13%	10%	7%	6%	4%
195	100%	83%	65%	48%	23%	20%	15%	11%	9%	7%
200	100%	89%	75%	60%	33%	29%	23%	17%	14%	11%
205	100%	93%	83%	71%	45%	40%	33%	25%	21%	17%
210	100%	96%	89%	80%	57%	52%	45%	35%	31%	25%
215	100%	97%	93%	87%	69%	65%	57%	48%	43%	35%
220	100%	98%	96%	92%	79%	75%	69%	60%	55%	48%
225	100%	99%	97%	95%	86%	83%	79%	71%	67%	60%
230	100%	99%	98%	97%	91%	89%	86%	80%	77%	71%
235	100%	100%	99%	98%	94%	93%	91%	87%	85%	80%
240	100%	100%	99%	99%	96%	96%	94%	92%	90%	87%
245	100%	100%	100%	99%	98%	97%	96%	95%	94%	92%
250	100%	100%	100%	100%	99%	98%	98%	97%	96%	95%
255	100%	100%	100%	100%	99%	99%	99%	98%	98%	97%
260	100%	100%	100%	100%	100%	99%	99%	99%	99%	98%
265	100%	100%	100%	100%	100%	100%	100%	99%	99%	99%
270	100%	100%	100%	100%	100%	100%	100%	100%	99%	99%
275	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
280	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	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 the Spring of the prior year. Example: if a 4th 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 60%.

Bold italics represent extrapolated data.

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	0.762	0.680
4	0.808	0.743
5	0.803	0.749
6	0.798	0.765
7	0.835	0.762
8	0.831	0.750
9	0.729	0.689
10	0.759	0.714
11	0.732	0.676

* 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	940	89.18%	5.03%	5.79%
4	876	90.61%	4.69%	4.69%
5	1075	90.65%	3.87%	5.48%
6	860	89.31%	5.34%	5.34%
7	991	89.98%	4.34%	5.68%
8	968	87.42%	5.92%	6.66%
9	1651	87.71%	5.22%	7.06%
10	1201	87.24%	5.63%	7.14%
11	975	87.47%	5.22%	7.31%
Reading				
3	1104	87.23%	5.93%	6.84%
4	1017	87.90%	5.85%	6.25%
5	1074	87.89%	5.91%	6.20%
6	861	82.43%	8.66%	8.90%
7	993	84.61%	7.54%	7.85%
8	1019	86.92%	6.14%	6.94%
9	1651	86.85%	5.90%	7.25%
10	1196	86.60%	6.14%	7.34%
11	968	86.81%	6.43%	6.75%

* 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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