



# Wyoming LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale  
with the Proficiency Tests for Wyoming Students (PAWS)

February 2011

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# A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE PROFICIENCY TESTS FOR WYOMING STUDENTS (PAWS)

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FEBRUARY 2011

Recently, NWEA completed a project to connect the scale of the Proficiency Tests for Wyoming Students used for Wyoming reading and Math 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 14,000 Wyoming students from 125 schools who completed both exams in the spring of 2010. The Proficiency for Wyoming Students state test is administered in the Spring. 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 40<sup>th</sup> percentile for the study population (this would not be the same as the 40<sup>th</sup> 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 (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.

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 and also for identifying target RIT-score objectives likely to correspond to a student's successful level of performance on the state test.

Table 9 shows the correlation coefficients between MAP and the state test for reading and mathematics 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 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 Proficiency Tests for Wyoming Students.

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

MATH-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Below Basic	Basic		Proficient		Advance	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<176	176	11	183	27	200	77
3	<187	187	11	195	27	211	77
4	<198	198	16	206	35	224	82
5	<204	204	16	214	37	232	80
6	<206	206	14	216	30	238	82
7	<211	211	16	223	36	242	79
8	<219	219	21	231	43	249	83

\* 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 (SPRING) RIT CUT SCORES  
CORRESPONDING TO STATE PERFORMANCE LEVELS – READING

READING-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Below Basic	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<172	172	10	188	45	205	88
3	<181	181	10	198	45	214	88
4	<184	184	7	201	34	217	81
5	<197	197	14	209	40	224	84
6	<195	195	9	212	38	227	82
7	<202	202	13	219	50	239	96
8	<203	203	10	218	37	236	87

\* 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 (FALL) RIT CUT SCORES CORRESPONDING TO STATE PERFORMANCE LEVELS – MATHEMATICS

MATH-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Below Basic	Basic		Proficient		Advance	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<167	167	11	173	30	187	78
3	<178	178	12	185	29	201	79
4	<191	191	17	199	37	214	83
5	<198	198	16	207	37	223	80
6	<202	202	14	211	31	232	83
7	<208	208	16	219	36	237	79
8	<216	216	21	227	43	245	83

\* 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 (FALL) RIT CUT SCORES CORRESPONDING TO STATE PERFORMANCE LEVELS – READING

READING-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Below Basic	Basic		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<163	163	11	177	45	196	89
3	<174	174	10	190	45	207	88
4	<179	179	7	196	36	212	82
5	<192	192	14	205	42	220	85
6	<192	192	9	209	39	224	83
7	<200	200	13	217	52	237	96
8	<201	201	10	216	38	234	87

\* 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 (SPRING), 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	<b>0%</b>	0%	0%	0%	0%	0%	0%
125	<b>0%</b>	0%	0%	0%	0%	0%	0%
130	<b>0%</b>	0%	0%	0%	0%	0%	0%
135	<b>1%</b>	0%	0%	0%	0%	0%	0%
140	<b>1%</b>	0%	0%	0%	0%	0%	0%
145	<b>2%</b>	1%	0%	0%	0%	0%	0%
150	<b>4%</b>	1%	0%	0%	0%	0%	0%
155	<b>6%</b>	2%	1%	0%	0%	0%	0%
160	<b>9%</b>	3%	1%	0%	0%	0%	0%
165	<b>14%</b>	5%	2%	1%	1%	0%	0%
170	<b>21%</b>	8%	3%	1%	1%	0%	0%
175	<b>31%</b>	12%	4%	2%	2%	1%	0%
180	<b>43%</b>	18%	7%	3%	3%	1%	1%
185	<b>55%</b>	27%	11%	5%	4%	2%	1%
190	<b>67%</b>	38%	17%	8%	7%	4%	2%
195	<b>77%</b>	50%	25%	13%	11%	6%	3%
200	<b>85%</b>	62%	35%	20%	17%	9%	4%
205	<b>90%</b>	73%	48%	29%	25%	14%	7%
210	<b>94%</b>	82%	60%	40%	35%	21%	11%
215	<b>96%</b>	88%	71%	52%	48%	31%	17%
220	<b>98%</b>	92%	80%	65%	60%	43%	25%
225	<b>99%</b>	95%	87%	75%	71%	55%	35%
230	<b>99%</b>	97%	92%	83%	80%	67%	48%
235	<b>99%</b>	98%	95%	89%	87%	77%	60%
240	<b>100%</b>	99%	97%	93%	92%	85%	71%
245	<b>100%</b>	99%	98%	96%	95%	90%	80%
250	<b>100%</b>	100%	99%	97%	97%	94%	87%
255	<b>100%</b>	100%	99%	98%	98%	96%	92%
260	<b>100%</b>	100%	100%	99%	99%	98%	95%
265	<b>100%</b>	100%	100%	99%	99%	99%	97%
270	<b>100%</b>	100%	100%	100%	100%	99%	98%
275	<b>100%</b>	100%	100%	100%	100%	99%	99%
280	<b>100%</b>	100%	100%	100%	100%	100%	99%
285	<b>100%</b>	100%	100%	100%	100%	100%	100%
290	<b>100%</b>	100%	100%	100%	100%	100%	100%
295	<b>100%</b>	100%	100%	100%	100%	100%	100%
300	<b>100%</b>	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 (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 20%.

**Italic** data represent extrapolated data.

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

**Bold** italics represent extrapolated data.

TABLE 7 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE MATHEMATICS TEST IN PRIOR SEASON (FALL), 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
120	<b>0%</b>	0%	0%	0%	0%	0%	0%
125	<b>1%</b>	0%	0%	0%	0%	0%	0%
130	<b>1%</b>	0%	0%	0%	0%	0%	0%
135	<b>2%</b>	1%	0%	0%	0%	0%	0%
140	<b>4%</b>	1%	0%	0%	0%	0%	0%
145	<b>6%</b>	2%	0%	0%	0%	0%	0%
150	<b>9%</b>	3%	1%	0%	0%	0%	0%
155	<b>14%</b>	5%	1%	1%	0%	0%	0%
160	<b>21%</b>	8%	2%	1%	1%	0%	0%
165	<b>31%</b>	12%	3%	1%	1%	0%	0%
170	<b>43%</b>	18%	5%	2%	2%	1%	0%
175	<b>55%</b>	27%	8%	4%	3%	1%	1%
180	<b>67%</b>	38%	13%	6%	4%	2%	1%
185	<b>77%</b>	50%	20%	10%	7%	3%	1%
190	<b>85%</b>	62%	29%	15%	11%	5%	2%
195	<b>90%</b>	73%	40%	23%	17%	8%	4%
200	<b>94%</b>	82%	52%	33%	25%	13%	6%
205	<b>96%</b>	88%	65%	45%	35%	20%	10%
210	<b>98%</b>	92%	75%	57%	48%	29%	15%
215	<b>99%</b>	95%	83%	69%	60%	40%	23%
220	<b>99%</b>	97%	89%	79%	71%	52%	33%
225	<b>99%</b>	98%	93%	86%	80%	65%	45%
230	<b>100%</b>	99%	96%	91%	87%	75%	57%
235	<b>100%</b>	99%	97%	94%	92%	83%	69%
240	<b>100%</b>	100%	98%	96%	95%	89%	79%
245	<b>100%</b>	100%	99%	98%	97%	93%	86%
250	<b>100%</b>	100%	99%	99%	98%	96%	91%
255	<b>100%</b>	100%	100%	99%	99%	97%	94%
260	<b>100%</b>	100%	100%	100%	99%	98%	96%
265	<b>100%</b>	100%	100%	100%	100%	99%	98%
270	<b>100%</b>	100%	100%	100%	100%	99%	99%
275	<b>100%</b>	100%	100%	100%	100%	100%	99%
280	<b>100%</b>	100%	100%	100%	100%	100%	100%
285	<b>100%</b>	100%	100%	100%	100%	100%	100%
290	<b>100%</b>	100%	100%	100%	100%	100%	100%
295	<b>100%</b>	100%	100%	100%	100%	100%	100%
300	<b>100%</b>	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 33%.

**Bold italics** represent extrapolated data.

TABLE 8 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE READING TEST IN PRIOR SEASON (FALL), 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
120	<b>0%</b>	0%	0%	0%	0%	0%	0%
125	<b>1%</b>	0%	0%	0%	0%	0%	0%
130	<b>1%</b>	0%	0%	0%	0%	0%	0%
135	<b>1%</b>	0%	0%	0%	0%	0%	0%
140	<b>2%</b>	1%	0%	0%	0%	0%	0%
145	<b>4%</b>	1%	1%	0%	0%	0%	0%
150	<b>6%</b>	2%	1%	0%	0%	0%	0%
155	<b>10%</b>	3%	2%	1%	0%	0%	0%
160	<b>15%</b>	5%	3%	1%	1%	0%	0%
165	<b>23%</b>	8%	4%	2%	1%	1%	1%
170	<b>33%</b>	12%	7%	3%	2%	1%	1%
175	<b>45%</b>	18%	11%	5%	3%	1%	2%
180	<b>57%</b>	27%	17%	8%	5%	2%	3%
185	<b>69%</b>	38%	25%	12%	8%	4%	4%
190	<b>79%</b>	50%	35%	18%	13%	6%	7%
195	<b>86%</b>	62%	48%	27%	20%	10%	11%
200	<b>91%</b>	73%	60%	38%	29%	15%	17%
205	<b>94%</b>	82%	71%	50%	40%	23%	25%
210	<b>96%</b>	88%	80%	62%	52%	33%	35%
215	<b>98%</b>	92%	87%	73%	65%	45%	48%
220	<b>99%</b>	95%	92%	82%	75%	57%	60%
225	<b>99%</b>	97%	95%	88%	83%	69%	71%
230	<b>100%</b>	98%	97%	92%	89%	79%	80%
235	<b>100%</b>	99%	98%	95%	93%	86%	87%
240	<b>100%</b>	99%	99%	97%	96%	91%	92%
245	<b>100%</b>	100%	99%	98%	97%	94%	95%
250	<b>100%</b>	100%	100%	99%	98%	96%	97%
255	<b>100%</b>	100%	100%	99%	99%	98%	98%
260	<b>100%</b>	100%	100%	100%	99%	99%	99%
265	<b>100%</b>	100%	100%	100%	100%	99%	99%
270	<b>100%</b>	100%	100%	100%	100%	100%	100%
275	<b>100%</b>	100%	100%	100%	100%	100%	100%
280	<b>100%</b>	100%	100%	100%	100%	100%	100%
285	<b>100%</b>	100%	100%	100%	100%	100%	100%
290	<b>100%</b>	100%	100%	100%	100%	100%	100%
295	<b>100%</b>	100%	100%	100%	100%	100%	100%
300	<b>100%</b>	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 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 38%

**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>
2		
3	0.659	0.593
4	0.684	0.642
5	0.650	0.593
6	0.712	0.676
7	0.688	0.602
8	0.564	0.492

\* 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
<b>Mathematics</b>				
3	2374	87.9%	5.4%	6.7%
4	2389	87.7%	5.5%	6.8%
5	2369	85.1%	6.9%	8.0%
6	2423	85.8%	7.3%	6.9%
7	2236	85.7%	6.8%	7.5%
8	2232	84.8%	7.3%	7.9%
<b>Reading</b>				
3	2373	78.0%	10.5%	11.6%
4	2385	82.6%	8.7%	8.7%
5	2376	79.4%	9.5%	11.1%
6	2413	83.7%	8.9%	7.4%
7	2225	79.1%	11.0%	9.9%
8	2242	81.7%	9.6%	8.7%

\* 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%.

