



ARIZONA LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale
with Arizona's Instrument to Measure Standards (AIMS)

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A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE ARIZONA'S INSTRUMENT TO MEASURE STANDARDS (AIMS)

FEBRUARY 2011

Recently, NWEA completed a project to connect the scale of Arizona's Instrument To Measure Standards (AIMS) used for Arizona'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 15,589 Arizona students from 51 schools who completed both exams in the spring of 2010. The Arizona state test is administered in the Spring. For the spring season (labeled "current season"), an Equipercetile 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.

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, 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 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 AIMS.

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	Falls Far Below	Approaches		Meets		Exceeds	
	Cut Score	Cut Score	Percen- tile	Cut Score	Percen- tile	Cut Score	Percen- tile
2	<176	176	11	189	42	201	80
3	<187	187	11	200	42	212	80
4	<197	197	15	207	38	222	78
5	<206	206	19	216	41	234	84
6	<211	211	21	223	46	239	84
7	<216	216	23	228	46	244	83
8	<225	225	31	234	50	251	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 (SPRING) RIT CUT SCORES
CORRESPONDING TO STATE PERFORMANCE LEVELS – READING

READING-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Falls Far Below	Approaches		Meets		Exceeds	
	Cut Score	Cut Score	Percen- tile	Cut Score	Percen- tile	Cut Score	Percen- tile
2	<164	164	3	181	27	205	88
3	<172	172	3	191	27	214	88
4	<175	175	2	199	29	222	90
5	<189	189	7	205	29	231	95
6	<191	191	6	206	24	235	95
7	<191	191	5	209	24	236	92
8	<202	202	9	215	29	242	96

* 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	Falls Far Below	Approaches		Meets		Exceeds	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<167	167	11	177	45	188	80
3	<178	178	12	190	43	202	81
4	<190	190	15	200	40	212	78
5	<200	200	19	209	43	226	85
6	<207	207	22	218	48	233	85
7	<213	213	24	223	46	239	83
8	<222	222	32	230	50	247	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 (FALL) RIT CUT SCORES CORRESPONDING TO STATE PERFORMANCE LEVELS – READING

READING-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Falls Far Below	Approaches		Meets		Exceeds	
	Cut Score	Cut Score	Percentile	Cut Score	Percentile	Cut Score	Percentile
2	<158	158	3	170	27	196	89
3	<166	166	3	183	27	207	88
4	<170	170	2	193	29	217	91
5	<185	185	7	200	29	227	95
6	<188	188	6	203	24	232	95
7	<190	190	5	207	25	234	93
8	<200	200	9	213	30	240	96

* 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	0%	0%	0%	0%	0%	0%	0%
125	0%	0%	0%	0%	0%	0%	0%
130	0%	0%	0%	0%	0%	0%	0%
135	0%	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	3%	1%	1%	0%	0%	0%	0%
160	5%	2%	1%	0%	0%	0%	0%
165	8%	3%	1%	1%	0%	0%	0%
170	13%	5%	2%	1%	0%	0%	0%
175	20%	8%	4%	2%	1%	0%	0%
180	29%	12%	6%	3%	1%	1%	0%
185	40%	18%	10%	4%	2%	1%	1%
190	52%	27%	15%	7%	4%	2%	1%
195	65%	38%	23%	11%	6%	4%	2%
200	75%	50%	33%	17%	9%	6%	3%
205	83%	62%	45%	25%	14%	9%	5%
210	89%	73%	57%	35%	21%	14%	8%
215	93%	82%	69%	48%	31%	21%	13%
220	96%	88%	79%	60%	43%	31%	20%
225	97%	92%	86%	71%	55%	43%	29%
230	98%	95%	91%	80%	67%	55%	40%
235	99%	97%	94%	87%	77%	67%	52%
240	99%	98%	96%	92%	85%	77%	65%
245	100%	99%	98%	95%	90%	85%	75%
250	100%	99%	99%	97%	94%	90%	83%
255	100%	100%	99%	98%	96%	94%	89%
260	100%	100%	100%	99%	98%	96%	93%
265	100%	100%	100%	99%	99%	98%	96%
270	100%	100%	100%	100%	99%	99%	97%
275	100%	100%	100%	100%	99%	99%	98%
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 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 17%.

Italics 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	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%	1%	0%	0%	0%	0%	0%
145	3%	1%	0%	0%	0%	0%	0%
150	4%	2%	1%	0%	0%	0%	0%
155	7%	3%	1%	1%	1%	0%	0%
160	11%	4%	2%	1%	1%	1%	0%
165	17%	7%	3%	2%	2%	1%	1%
170	25%	11%	5%	3%	3%	2%	1%
175	35%	17%	8%	5%	4%	3%	2%
180	48%	25%	13%	8%	7%	5%	3%
185	60%	35%	20%	12%	11%	8%	5%
190	71%	48%	29%	18%	17%	13%	8%
195	80%	60%	40%	27%	25%	20%	12%
200	87%	71%	52%	38%	35%	29%	18%
205	92%	80%	65%	50%	48%	40%	27%
210	95%	87%	75%	62%	60%	52%	38%
215	97%	92%	83%	73%	71%	65%	50%
220	98%	95%	89%	82%	80%	75%	62%
225	99%	97%	93%	88%	87%	83%	73%
230	99%	98%	96%	92%	92%	89%	82%
235	100%	99%	97%	95%	95%	93%	88%
240	100%	99%	98%	97%	97%	96%	92%
245	100%	100%	99%	98%	98%	97%	95%
250	100%	100%	99%	99%	99%	98%	97%
255	100%	100%	100%	99%	99%	99%	98%
260	100%	100%	100%	100%	100%	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 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 38%.

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	0%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%
140	2%	1%	0%	0%	0%	0%	0%
145	4%	1%	0%	0%	0%	0%	0%
150	6%	2%	1%	0%	0%	0%	0%
155	10%	3%	1%	0%	0%	0%	0%
160	15%	5%	2%	1%	0%	0%	0%
165	23%	8%	3%	1%	0%	0%	0%
170	33%	12%	5%	2%	1%	0%	0%
175	45%	18%	8%	3%	1%	1%	0%
180	57%	27%	12%	5%	2%	1%	1%
185	69%	38%	18%	8%	4%	2%	1%
190	79%	50%	27%	13%	6%	4%	2%
195	86%	62%	38%	20%	9%	6%	3%
200	91%	73%	50%	29%	14%	9%	5%
205	94%	82%	62%	40%	21%	14%	8%
210	96%	88%	73%	52%	31%	21%	12%
215	98%	92%	82%	65%	43%	31%	18%
220	99%	95%	88%	75%	55%	43%	27%
225	99%	97%	92%	83%	67%	55%	38%
230	100%	98%	95%	89%	77%	67%	50%
235	100%	99%	97%	93%	85%	77%	62%
240	100%	99%	98%	96%	90%	85%	73%
245	100%	100%	99%	97%	94%	90%	82%
250	100%	100%	99%	98%	96%	94%	88%
255	100%	100%	100%	99%	98%	96%	92%
260	100%	100%	100%	99%	99%	98%	95%
265	100%	100%	100%	100%	99%	99%	97%
270	100%	100%	100%	100%	99%	99%	98%
275	100%	100%	100%	100%	100%	99%	99%
280	100%	100%	100%	100%	100%	100%	99%
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 29%.

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	1%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%
130	2%	0%	0%	0%	0%	0%	0%
135	3%	1%	0%	0%	0%	0%	0%
140	5%	1%	0%	0%	0%	0%	0%
145	8%	2%	1%	0%	0%	0%	0%
150	12%	4%	1%	1%	0%	0%	0%
155	18%	6%	2%	1%	1%	1%	0%
160	27%	9%	4%	2%	1%	1%	0%
165	38%	14%	6%	3%	2%	1%	1%
170	50%	21%	9%	5%	4%	2%	1%
175	62%	31%	14%	8%	6%	4%	2%
180	73%	43%	21%	12%	9%	6%	4%
185	82%	55%	31%	18%	14%	10%	6%
190	88%	67%	43%	27%	21%	15%	9%
195	92%	77%	55%	38%	31%	23%	14%
200	95%	85%	67%	50%	43%	33%	21%
205	97%	90%	77%	62%	55%	45%	31%
210	98%	94%	85%	73%	67%	57%	43%
215	99%	96%	90%	82%	77%	69%	55%
220	99%	98%	94%	88%	85%	79%	67%
225	100%	99%	96%	92%	90%	86%	77%
230	100%	99%	98%	95%	94%	91%	85%
235	100%	99%	99%	97%	96%	94%	90%
240	100%	100%	99%	98%	98%	96%	94%
245	100%	100%	99%	99%	99%	98%	96%
250	100%	100%	100%	99%	99%	99%	98%
255	100%	100%	100%	100%	99%	99%	99%
260	100%	100%	100%	100%	100%	100%	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 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 50%.

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	0.855	0.832
4	0.851	0.815
5	0.884	0.831
6	0.868	0.831
7	0.887	0.811
8	0.873	0.797

* 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	2679	86.0%	7.2%	6.8%
4	2556	88.2%	5.6%	6.1%
5	2594	87.2%	6.1%	6.7%
6	2285	86.3%	6.5%	7.2%
7	2180	85.7%	7.3%	7.0%
8	2314	85.9%	7.8%	6.3%
Reading				
3	2804	87.6%	5.9%	6.5%
4	2692	87.2%	6.9%	5.9%
5	2708	87.7%	6.6%	5.7%
6	2394	88.6%	5.8%	5.6%
7	2352	88.7%	5.7%	5.7%
8	2453	86.2%	6.9%	6.9%

* 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%.