



# MICHIGAN LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale  
with the Michigan Educational Assessment Program (MEAP)

April 2012

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# A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM (MEAP)

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APRIL 2012

Recently, NWEA completed a project to connect the scale of the Michigan Educational Assessment Program (MEAP) used for Michigan’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 19,908 Michigan students from at least 94 schools who completed both exams in the fall of 2011. The Michigan state test is administered in the fall. For the fall season (labeled “current season”), an Equipercetile method was used to estimate the RIT score equivalent to each state performance level. For spring (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.

Table Sets 1 and 2 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.

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 MEAP.

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

MATH-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Not Proficient	Partially Proficient		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<171	171	29	181	59	203	97
3	<185	185	29	195	59	215	97
4	<198	198	33	204	51	222	92
5	<205	205	29	212	47	232	91
6	<212	212	31	222	56	243	94
7	<219	219	35	228	56	247	90
8	<223	223	34	237	66	255	93

READING-Current Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Not Proficient	Partially Proficient		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<152	152	6	170	35	192	86
3	<166	166	6	184	35	206	86
4	<178	178	6	192	29	217	89
5	<188	188	9	199	28	221	84
6	<196	196	13	205	31	221	73
7	<200	200	13	212	38	227	77
8	<201	201	11	217	44	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 Table Set 3 to determine the appropriate 'target' scores for a desired level of certainty. Italics represent extrapolated data.

TABLE SET 2 – MINIMUM ESTIMATED PRIOR-SEASON (SPRING) RIT CUT SCORES  
CORRESPONDING TO STATE PERFORMANCE LEVELS

MATH-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Not Proficient	Partially Proficient		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<172	172	29	182	59	203	97
3	<184	184	28	194	59	215	97
4	<197	197	32	203	50	221	92
5	<204	204	27	211	46	231	91
6	<213	213	29	223	55	244	94
7	<219	219	34	228	56	246	90
8	<223	223	33	237	64	257	93

READING-Prior Season							
Cut Scores and Percentiles for each State Performance Level							
Grade	Not Proficient	Partially Proficient		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<154	154	6	171	34	193	86
3	<167	167	6	184	35	206	86
4	<177	177	6	191	28	217	89
5	<188	188	9	198	27	220	83
6	<196	196	13	205	30	221	73
7	<200	200	13	212	38	227	77
8	<202	202	11	217	43	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 Table Set 4 to determine the appropriate 'target' scores for a desired level of certainty. Italics represent extrapolated data.

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

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



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	.817	.783
4	.847	.757
5	.872	.789
6	.861	.784
7	.861	.790
8	.834	.754

\* 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
<b>Mathematics</b>				
3	3408	84.9%	7.6%	7.5%
4	3253	85.7%	6.9%	7.4%
5	3491	86.5%	7.0%	6.6%
6	3345	87.3%	6.7%	6.1%
7	3346	88.9%	5.7%	5.4%
8	2803	88.9%	5.4%	5.7%
<b>Reading</b>				
3	3181	81.5%	9.6%	8.8%
4	3079	82.5%	9.1%	8.4%
5	3349	83.2%	7.9%	8.8%
6	3322	83.3%	8.4%	8.3%
7	3235	83.7%	8.7%	7.6%
8	2703	79.8%	10.6%	9.7%

\* Note: The third column of this table shows the percentage of students whose Pass/Not Pass 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%.