

# Arkansas LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale  
with the Arkansas Comprehensive Testing, Assessment and  
Accountability Program (ACTAAP)

March 2010

The Kingsbury Center at Northwest Evaluation Association

---



---

**KINGSBURY**  
CENTER AT NWEA

---

COPYRIGHT © 2010 NORTHWEST EVALUATION ASSOCIATION

All rights reserved. No part of this document may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from NWEA.



# A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE ARKANSAS ACTAAP

KINGSBURY CENTER AT NWEA

MARCH 2010

Recently, NWEA completed a project to connect the scale of Augmented Benchmark Exam used for Arkansas 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 9384 Arkansas students from 20 schools who completed both exams in the spring of 2009. The Arkansas state test is administered in spring. For the spring 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 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, 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 Arkansas test for reading and mathematics at each of the grades 3 through 8. These statistics show the degree to which MAP and the Augmented Benchmark Exam 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 ACTAAP.

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		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<i>&lt;170</i>	<b>170</b>	<b>3</b>	<b>181</b>	<b>21</b>	<b>192</b>	<b>53</b>
3	<177	177	3	193	21	204	53
4	<195	195	11	203	25	213	53
5	<202	202	13	211	28	226	65
6	<199	199	7	214	25	226	52
7	<211	211	16	222	33	236	64
8	<220	220	22	229	38	245	74

\* 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		Proficient		Advanced	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<i>&lt;175</i>	<b>175</b>	<b>14</b>	<b>185</b>	<b>35</b>	<b>196</b>	<b>67</b>
3	<184	184	14	195	35	206	67
4	<183	183	6	200	30	213	68
5	<190	190	8	207	33	219	70
6	<194	194	8	210	31	222	67
7	<195	195	7	215	36	228	74
8	<195	195	5	212	22	228	64

\* 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		Proficient		Advanced	
	Cut Score	Cut Score	Per- centile	Cut Score	Per- centile	Cut Score	Per- centile
2	<i>&lt;163</i>	<b>163</b>	<b>2</b>	<b>171</b>	<b>21</b>	<b>179</b>	<b>50</b>
3	<171	171	3	182	19	193	51
4	<187	187	10	195	24	204	51
5	<197	197	13	204	27	217	64
6	<196	196	7	209	25	220	52
7	<208	208	16	218	33	231	64
8	<217	217	22	225	37	241	74

\* 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		Proficient		Advanced	
	Cut Score	Cut Score	Per- centile	Cut Score	Per- centile	Cut Score	Per- centile
2	<i>&lt;165</i>	<b>165</b>	<b>14</b>	<b>174</b>	<b>35</b>	<b>186</b>	<b>67</b>
3	<177	177	14	186	33	198	66
4	<177	177	6	194	30	207	67
5	<186	186	8	202	32	214	68
6	<191	191	8	206	30	218	65
7	<193	193	7	212	35	225	74
8	<193	193	5	210	22	225	63

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

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	<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>3%</b>	1%	1%	0%	0%	0%	0%
155	<b>5%</b>	2%	1%	1%	0%	0%	0%
160	<b>8%</b>	3%	2%	1%	1%	0%	1%
165	<b>12%</b>	5%	3%	1%	1%	1%	1%
170	<b>18%</b>	8%	5%	2%	2%	1%	1%
175	<b>27%</b>	12%	8%	4%	3%	2%	2%
180	<b>38%</b>	18%	12%	6%	5%	3%	4%
185	<b>50%</b>	27%	18%	10%	8%	5%	6%
190	<b>62%</b>	38%	27%	15%	12%	8%	10%
195	<b>73%</b>	50%	38%	23%	18%	12%	15%
200	<b>82%</b>	62%	50%	33%	27%	18%	23%
205	<b>88%</b>	73%	62%	45%	38%	27%	33%
210	<b>92%</b>	82%	73%	57%	50%	38%	45%
215	<b>95%</b>	88%	82%	69%	62%	50%	57%
220	<b>97%</b>	92%	88%	79%	73%	62%	69%
225	<b>98%</b>	95%	92%	86%	82%	73%	79%
230	<b>99%</b>	97%	95%	91%	88%	82%	86%
235	<b>99%</b>	98%	97%	94%	92%	88%	91%
240	<b>100%</b>	99%	98%	96%	95%	92%	94%
245	<b>100%</b>	99%	99%	98%	97%	95%	96%
250	<b>100%</b>	100%	99%	99%	98%	97%	98%
255	<b>100%</b>	100%	100%	99%	99%	98%	99%
260	<b>100%</b>	100%	100%	100%	99%	99%	99%
265	<b>100%</b>	100%	100%	100%	100%	99%	100%
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 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 33%.

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	1%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%
130	2%	1%	0%	0%	0%	0%	0%
135	3%	1%	0%	0%	0%	0%	0%
140	4%	1%	0%	0%	0%	0%	0%
145	7%	2%	1%	0%	0%	0%	0%
150	11%	4%	1%	0%	0%	0%	0%
155	17%	6%	2%	1%	0%	0%	0%
160	25%	10%	3%	1%	1%	0%	0%
165	35%	15%	5%	2%	1%	0%	0%
170	48%	23%	8%	3%	2%	1%	0%
175	60%	33%	12%	5%	3%	1%	1%
180	71%	45%	18%	8%	5%	2%	1%
185	80%	57%	27%	13%	8%	4%	2%
190	87%	69%	38%	20%	13%	6%	3%
195	92%	79%	50%	29%	20%	9%	5%
200	95%	86%	62%	40%	29%	14%	8%
205	97%	91%	73%	52%	40%	21%	12%
210	98%	94%	82%	65%	52%	31%	18%
215	99%	96%	88%	75%	65%	43%	27%
220	99%	98%	92%	83%	75%	55%	38%
225	100%	99%	95%	89%	83%	67%	50%
230	100%	99%	97%	93%	89%	77%	62%
235	100%	100%	98%	96%	93%	85%	73%
240	100%	100%	99%	97%	96%	90%	82%
245	100%	100%	99%	98%	97%	94%	88%
250	100%	100%	100%	99%	98%	96%	92%
255	100%	100%	100%	99%	99%	98%	95%
260	100%	100%	100%	100%	99%	99%	97%
265	100%	100%	100%	100%	100%	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 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 40%.

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>2%</b>	1%	0%	0%	0%	0%	0%
140	<b>3%</b>	1%	0%	0%	0%	0%	0%
145	<b>5%</b>	2%	1%	0%	0%	0%	0%
150	<b>8%</b>	3%	1%	1%	0%	0%	0%
155	<b>13%</b>	4%	2%	1%	1%	0%	0%
160	<b>20%</b>	7%	3%	1%	1%	1%	1%
165	<b>29%</b>	11%	5%	2%	2%	1%	1%
170	<b>40%</b>	17%	8%	4%	3%	1%	2%
175	<b>52%</b>	25%	13%	6%	4%	2%	3%
180	<b>65%</b>	35%	20%	10%	7%	4%	5%
185	<b>75%</b>	48%	29%	15%	11%	6%	8%
190	<b>83%</b>	60%	40%	23%	17%	10%	12%
195	<b>89%</b>	71%	52%	33%	25%	15%	18%
200	<b>93%</b>	80%	65%	45%	35%	23%	27%
205	<b>96%</b>	87%	75%	57%	48%	33%	38%
210	<b>97%</b>	92%	83%	69%	60%	45%	50%
215	<b>98%</b>	95%	89%	79%	71%	57%	62%
220	<b>99%</b>	97%	93%	86%	80%	69%	73%
225	<b>99%</b>	98%	96%	91%	87%	79%	82%
230	<b>100%</b>	99%	97%	94%	92%	86%	88%
235	<b>100%</b>	99%	98%	96%	95%	91%	92%
240	<b>100%</b>	100%	99%	98%	97%	94%	95%
245	<b>100%</b>	100%	99%	99%	98%	96%	97%
250	<b>100%</b>	100%	100%	99%	99%	98%	98%
255	<b>100%</b>	100%	100%	100%	99%	99%	99%
260	<b>100%</b>	100%	100%	100%	100%	99%	99%
265	<b>100%</b>	100%	100%	100%	100%	100%	100%
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 45%.

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	0.802	0.772
4	0.817	0.789
5	0.869	0.826
6	0.853	0.816
7	0.870	0.797
8	0.869	0.779

\* 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	1787	88.64%	5.32%	6.04%
4	1712	86.97%	6.07%	6.95%
5	1286	86.78%	6.22%	7.00%
6	1054	86.15%	6.64%	7.21%
7	1155	86.15%	6.93%	6.93%
8	1135	86.17%	6.34%	7.49%
<b>Reading</b>				
3	1868	80.84%	9.26%	9.90%
4	1743	82.39%	7.69%	9.93%
5	1307	82.56%	7.57%	9.87%
6	1056	83.90%	6.91%	9.19%
7	1164	81.96%	8.93%	9.11%
8	1144	82.69%	7.78%	9.53%

\* 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%.



---

**KINGSBURY**  
CENTER AT NWEA

---

The Kingsbury Center at NWEA  
5885 SW Meadows Road, Suite 200  
Lake Oswego, OR 97035-3526

[www.kingsburycenter.org](http://www.kingsburycenter.org)

Tel 503-624-1951  
Fax 503-639-7873