KENTUCKY
LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale
with Kentucky's Performance Rating For Educational Progress
(K-PREP)

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NWEA
Northwest Evaluation Association
Partnering to help all kids learn

A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE KENTUCKY PERFORMANCE RATING FOR EDUCATIONAL PROGRESS (K-PREP)

JANUARY 2013

Recently, NWEA completed a project to connect the scale of Kentucky Performance Rating For Educational Progress (K-PREP) used for Kentucky'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 11,577 Kentucky students who completed both exams in the spring of 2012. The Kentucky 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 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.

Table Sets 1 and 2 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.

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 K-PREP.

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

MATH - Current Season							
Cut Scores and %tiles for each State Performance Level							
Grade	Novice	Apprentice		Proficient		Distinguished	
	Cut Score	Cut Score	%tile	Cut Score	%tile	Cut Score	%tile
2	<184	184	29	194	59	207	90
3	<196	196	29	206	59	220	90
4	<203	203	25	217	63	229	88
5	<207	207	17	225	61	239	89
6	<211	211	18	227	53	241	83
7	<217	217	22	234	58	247	83
8	<218	218	18	235	51	252	84
READING - Current Season							
Cut Scores and %tiles for each State Performance Level							
Grade	Novice	Apprentice		Proficient		Distinguished	
	Cut Score	Cut Score	%tile	Cut Score	%tile	Cut Score	%tile
2	<182	182	31	192	58	204	83
3	<192	192	31	202	58	213	83
4	<200	200	32	210	59	220	83
5	<208	208	38	215	58	225	81
6	<211	211	36	218	54	228	79
7	<212	212	30	222	56	232	80
8	<217	217	36	225	57	235	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 Table Set 3 to determine the appropriate 'target' scores for a desired level of certainty. Italics represent extrapolated data.

MATH - Prior Season							
Cut Scores and %tiles for each State Performance Level							
Grade	Novice	Apprentice			Proficient		Distinguished	
	Cut Score	Cut Score	%tile	Cut Score	%tile	Cut Score	%tile
2	<171	171	29	181	59	195	90
3	<185	185	29	195	59	208	90
4	<195	195	25	208	63	219	88
5	<199	199	16	217	61	230	89
6	<205	205	17	220	51	234	83
7	<212	212	21	229	58	241	82
8	<214	214	17	230	50	247	84

READING - Prior Season							
Cut Scores and %tiles for each State Performance Level							
Grade	Novice	Apprentice			Proficient		Distinguished	
	Cut Score	Cut Score	%tile	Cut Score	%tile	Cut Score	%tile
2	<168	168	30	179	58	190	82
3	<182	182	30	193	58	204	83
4	<193	193	32	203	59	213	82
5	<202	202	36	210	58	219	80
6	<207	207	36	213	52	224	79
7	<209	209	30	218	55	228	79
8	<214	214	36	222	57	232	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 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 (SPRING), 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	0%	0%	0%	0%	0%	0%	0%
135	0%	0%	0%	0%	0%	0%	0%
140	0%	0%	0%	0%	0%	0%	0%
145	1%	0%	0%	0%	0%	0%	0%
150	1%	0%	0%	0%	0%	0%	0%
155	2%	1%	0%	0%	0%	0%	0%
160	3%	1%	0%	0%	0%	0%	0%
165	5%	2%	1%	0%	0%	0%	0%
170	8%	3%	1%	0%	0%	0%	0%
175	13%	4%	1%	1%	1%	0%	0%
180	20%	7%	2%	1%	1%	0%	0%
185	29%	11%	4%	2%	1%	1%	1%
190	40%	17%	6%	3%	2%	1%	1%
195	52%	25%	10%	5%	4%	2%	2%
200	65%	35%	15%	8%	6%	3%	3%
205	75%	48%	23%	12%	10%	5%	5%
210	83%	60%	33%	18%	15%	8%	8%
215	89%	71%	45%	27%	23%	13%	12%
220	93%	80%	57%	38%	33%	20%	18%
225	96%	87%	69%	50%	45%	29%	27%
230	97%	92%	79%	62%	57%	40%	38%
235	98%	95%	86%	73%	69%	52%	50%
240	99%	97%	91%	82%	79%	65%	62%
245	99%	98%	94%	88%	86%	75%	73%
250	100%	99%	96%	92%	91%	83%	82%
255	100%	99%	98%	95%	94%	89%	88%
260	100%	100%	99%	97%	96%	93%	92%
265	100%	100%	99%	98%	98%	96%	95%
270	100%	100%	100%	99%	99%	97%	97%
275	100%	100%	100%	99%	99%	98%	98%
280	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	99%	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 8%.

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
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	1%	1%	0%	0%	0%	0%	0%
155	2%	1%	0%	0%	0%	0%	0%
160	4%	1%	1%	0%	0%	0%	0%
165	6%	2%	1%	1%	0%	0%	0%
170	10%	4%	2%	1%	1%	1%	0%
175	15%	6%	3%	2%	1%	1%	1%
180	23%	10%	5%	3%	2%	1%	1%
185	33%	15%	8%	5%	4%	2%	2%
190	45%	23%	12%	8%	6%	4%	3%
195	57%	33%	18%	12%	9%	6%	5%
200	69%	45%	27%	18%	14%	10%	8%
205	79%	57%	38%	27%	21%	15%	12%
210	86%	69%	50%	38%	31%	23%	18%
215	91%	79%	62%	50%	43%	33%	27%
220	94%	86%	73%	62%	55%	45%	38%
225	96%	91%	82%	73%	67%	57%	50%
230	98%	94%	88%	82%	77%	69%	62%
235	99%	96%	92%	88%	85%	79%	73%
240	99%	98%	95%	92%	90%	86%	82%
245	100%	99%	97%	95%	94%	91%	88%
250	100%	99%	98%	97%	96%	94%	92%
255	100%	100%	99%	98%	98%	96%	95%
260	100%	100%	99%	99%	99%	98%	97%
265	100%	100%	100%	99%	99%	99%	98%
270	100%	100%	100%	100%	99%	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 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 18%.

Italics represent extrapolated data.

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

Italics represent extrapolated data.

RIT Range	2	3	4	5		6	7
READING - Prior Season							
Estimated Probability of Passing State Test Based on Observed MAP Score							
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	5%	1%	0%	0%	0%	0%	0%
155	8%	2%	1%	0%	0%	0%	0%
160	13%	4%	1%	1%	0%	0%	0%
165	20%	6%	2%	1%	1%	0%	0%
170	29%	9%	4%	2%	1%	1%	1%
175	40%	14%	6%	3%	2%	1%	1%
180	52%	21%	9%	5%	4%	2%	1%
185	65%	31%	14%	8%	6%	4%	2%
190	75%	43%	21%	12%	9%	6%	4%
195	83%	55%	31%	18%	14%	9%	6%
200	89%	67%	43%	27%	21%	14%	10%
205	93%	77%	55%	38%	31%	21%	15%
210	96%	85%	67%	50%	43%	31%	23%
215	97%	90%	77%	62%	55%	43%	33%
220	98%	94%	85%	73%	67%	55%	45%
225	99%	96%	90%	82%	77%	67%	57%
230	99%	98%	94%	88%	85%	77%	69%
235	100%	99%	96%	92%	90%	85%	79%
240	100%	99%	98%	95%	94%	90%	86%
245	100%	99%	99%	97%	96%	94%	91%
250	100%	100%	99%	98%	98%	96%	94%
255	100%	100%	99%	99%	99%	98%	96%
260	100%	100%	100%	99%	99%	99%	98%
265	100%	100%	100%	100%	99%	99%	99%
270	100%	100%	100%	100%	100%	99%	99%
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 (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 27%.

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	0.783	0.692
4	0.795	0.717
5	0.791	0.736
6	0.784	0.753
7	0.808	0.744
8	0.806	0.774

* 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
Mathematics				
3	1993	80.0%	9.7%	10.3%
4	1989	83.0%	9.0%	8.0%
5	2059	81.0%	9.6%	9.4%
6	1772	80.7%	10.0%	9.3%
7	1836	86.9%	7.0%	6.0%
8	1791	83.0%	8.8%	8.2%
Reading				
3	1958	77.2%	11.2%	11.6%
4	1958	78.8%	11.4%	9.9%
5	2024	78.8%	9.7%	11.5%
6	1743	78.4%	10.0%	11.6%
7	1834	79.3%	11.4%	9.3%
8	1769	80.6%	10.4%	9.0%

[*]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%.