

Linking the Nebraska NeSA Assessments to NWEA MAP Growth Tests^{*}

^{*}As of June 2017 Measures of Academic Progress® (MAP®) is known as MAP® Growth™.

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Introduction

Northwest Evaluation Association™ (NWEA™) is committed to providing partners with useful tools to help make inferences from the Measures of Academic Progress® (MAP®) interim assessment scores. One important tool is the concordance table between MAP and state summative assessments. Concordance tables have been used for decades to relate scores on different tests measuring similar but distinct constructs. These tables, typically derived from statistical linking procedures, provide a direct link between scores on different tests and serve various purposes. Aside from describing how a score on one test relates to performance on another test, they can also be used to identify benchmark scores on one test corresponding to performance categories on another test, or to maintain continuity of scores on a test after the test is redesigned or changed. Concordance tables are helpful for educators, parents, administrators, researchers, and policy makers to evaluate and formulate academic standing and growth.

Recently, NWEA completed a concordance study to connect the scales of the Nebraska State Accountability (NeSA) reading and math tests with those of the MAP Reading and MAP for Mathematics assessments. In this report, we present the 3rd through 8th grade cut scores on MAP reading and mathematics scales that correspond to the benchmarks on the NeSA reading and math tests. Information about the consistency rate of classification based on the estimated MAP cut scores is also provided, along with a series of tables that predict the probability of receiving a Level 2 (i.e., “Proficient”) or higher performance designation on the NeSA assessments, based on the observed MAP scores taken during the same school year. A detailed description of the data and analysis method used in this study is provided in the Appendix.

Overview of Assessments

NeSA assessments include a series of achievement tests aligned to the Nebraska Common Core State Standards in reading, mathematics, and science. NeSA tests can be delivered online as well as in a paper-pencil form. For each grade and subject, there are two cut scores that distinguish between performance levels: Level 1: *Below the Standards*, Level 2: *Meets the Standards* and Level 3: *Exceeds the Standards*. The Level 2 cut score demarks the minimum level of performance considered to be “Proficient” for accountability purposes.

MAP tests are interim assessments that are administered in the form of a CAT. MAP tests are constructed to measure student achievement from Grades K to 12 in math, reading, language usage, and science and aligned to the Nebraska State Standards. Unlike NeSA, MAP assessments are vertically scaled across grades, a feature that supports direct measurement of academic

growth and change. MAP scores are reported on a **Rasch Unit (RIT)** scale with a range from 100 to 350. Each subject has its own RIT scale.

To aid interpretation of MAP scores, NWEA periodically conducts norming studies of student and school performance on MAP. For example, the 2015 RIT Scale norming study (Thum & Hauser, 2015) employed multi-level growth models on nearly 500,000 longitudinal test scores from over 100,000 students that were weighted to create large, nationally representative norms for math, reading, language usage, and general science.

Estimated MAP Cut Scores Associated with NeSA Readiness Levels

Tables 1 to 4 report the NeSA scaled scores associated with each of the three performance levels, as well as the estimated score range on the MAP tests associated with each NeSA performance level. Specifically, Tables 1 and 2 apply to MAP scores obtained during the spring testing season for reading and math, respectively. Tables 3 and 4 apply to MAP tests taken in a prior testing season (fall or winter) for reading and math, respectively. The tables also report the percentile rank (based on the *NWEA 2015 MAP Norms*) associated with each estimated MAP cut score. The MAP cut scores can be used to predict students' most probable NeSA performance level, based on their observed MAP scores. For example, a 6th grade student who obtained a MAP math score of 235 in the spring testing season is likely to be at the very high end of Level 2 (Meets) on the NeSA taken during that same testing season (see Table 2). Similarly, a 3rd grade student who obtained a MAP reading score of 205 in the fall testing season is likely to be at Level 3 (Exceeds) on the NeSA taken in the spring of 3rd grade (see Table 3).

TABLE 1. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN NESAS AND MAP READING (WHEN MAP IS TAKEN IN SPRING)

Grade	NeSA					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
3	1-84		85-134		135-200	
4	1-84		85-134		135-200	
5	1-84		85-134		135-200	
6	1-84		85-134		135-200	
7	1-84		85-134		135-200	
8	1-84		85-134		135-200	

Grade	MAP					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-191	1-31	192-210	32-78	211-350	79-99
4	100-199	1-33	200-216	34-76	217-350	77-99
5	100-204	1-31	205-218	32-67	219-350	68-99
6	100-209	1-33	210-223	34-70	224-350	71-99
7	100-210	1-30	211-223	31-63	224-350	64-99
8	100-214	1-36	215-231	37-76	232-350	77-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “Proficient” for accountability purposes.

TABLE 2. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN NESAS AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

Grade	NeSA					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
3	1-84		85-134		135-200	
4	1-84		85-134		135-200	
5	1-84		85-134		135-200	
6	1-84		85-134		135-200	
7	1-84		85-134		135-200	
8	1-84		85-134		135-200	

Grade	MAP					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-197	1-33	198-213	34-76	214-350	77-99
4	100-207	1-34	208-226	35-80	227-350	81-99
5	100-214	1-33	215-235	34-80	236-350	81-99
6	100-220	1-38	221-237	39-76	238-350	77-99
7	100-223	1-38	224-242	39-78	243-350	79-99
8	100-228	1-44	229-249	45-83	250-350	84-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “Proficient” for accountability purposes.

TABLE 3. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN NESAS AND MAP READING (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING NESAS TESTS)

Grade	NeSA					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
3	1-84		85-134		135-200	
4	1-84		85-134		135-200	
5	1-84		85-134		135-200	
6	1-84		85-134		135-200	
7	1-84		85-134		135-200	
8	1-84		85-134		135-200	

Grade	MAP FALL					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-179	1-28	180-202	29-81	203-350	82-99
4	100-190	1-31	191-210	32-78	211-350	79-99
5	100-197	1-29	198-213	30-69	214-350	70-99
6	100-203	1-30	204-219	31-71	220-350	72-99
7	100-205	1-27	206-220	28-65	221-350	66-99
8	100-210	1-33	211-229	34-78	230-350	79-99

Grade	MAP WINTER					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-187	1-29	188-208	30-80	209-350	81-99
4	100-196	1-31	197-214	32-76	215-350	77-99
5	100-202	1-30	203-216	31-67	217-350	68-99
6	100-207	1-32	208-222	33-71	223-350	72-99
7	100-208	1-28	209-222	29-64	223-350	65-99
8	100-213	1-35	214-230	36-77	231-350	78-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least "Proficient" for accountability purposes.

TABLE 4. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN NESAS AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING NESAS TESTS)

Grade	NeSA					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
3	1-84		85-134		135-200	
4	1-84		85-134		135-200	
5	1-84		85-134		135-200	
6	1-84		85-134		135-200	
7	1-84		85-134		135-200	
8	1-84		85-134		135-200	

Grade	MAP FALL					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-184	1-32	185-201	33-80	202-350	81-99
4	100-195	1-31	196-215	32-83	216-350	84-99
5	100-204	1-31	205-225	32-83	226-350	84-99
6	100-212	1-37	213-229	38-77	230-350	78-99
7	100-217	1-37	218-236	38-79	237-350	80-99
8	100-223	1-43	224-245	44-85	246-350	86-99

Grade	MAP WINTER					
	Level 1 <i>Below</i>		Level 2 <i>Meets</i>		Level 3 <i>Exceeds</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-192	1-33	193-208	34-78	209-350	79-99
4	100-202	1-33	203-221	34-81	222-350	82-99
5	100-210	1-33	211-231	34-82	232-350	83-99
6	100-217	1-38	218-234	39-78	235-350	79-99
7	100-221	1-39	222-240	40-80	241-350	81-99
8	100-226	1-44	227-247	45-84	248-350	85-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least "Proficient" for accountability purposes.

Consistency Rate of Classification

Consistency rate of classification (Pommerich, Hanson, Harris, & Scoring, 2004), expressed in the form of a rate between 0 and 1, provides a means to measure the departure from equity for concordances (Hanson et al., 2001). This index can also be used as an indicator for the predictive validity of the MAP tests, i.e., how accurately the MAP scores can predict a student’s proficiency status in the NeSA test. For each pair of concordant scores, a classification is considered consistent if the examinee is classified into the same performance category regardless of the test used for making a decision. Consistency rate provided in this report can be calculated as, for the “Proficient” performance category concordant scores, the percentage of examinees who score at or above both concordant scores plus the percentage of examinees who score below both concordant scores on each test. Higher consistency rate indicates stronger congruence between NeSA and MAP scores. The results in Table 5 demonstrate that on average MAP reading scores can consistently classify students’ proficiency (Level 2 or higher) status on NeSA reading test 90% of the time and MAP math scores can consistently classify students on NeSA math test 90% of the time. Those numbers are high suggesting that both MAP reading and math tests are great predictors of the students’ proficiency status on the NeSA tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND NESAS LEVEL 2 EQUIPERCENTILE CONCORDANCES

Grade	Reading			Math		
	Consistency Rate	False		Consistency Rate	False	
		Positives	Negatives		Positives	Negatives
3	0.89	0.06	0.05	0.88	0.07	0.05
4	0.91	0.05	0.04	0.90	0.06	0.04
5	0.91	0.04	0.05	0.90	0.06	0.04
6	0.89	0.05	0.06	0.90	0.06	0.04
7	0.91	0.04	0.05	0.88	0.06	0.06
8	0.86	0.07	0.07	0.89	0.06	0.05

Proficiency Projection

Proficiency projection tells how likely a student is classified as “Proficient” on NeSA tests based on his/her observed MAP scores. The conditional growth norms provided in the 2015 MAP Norms were used to calculate this information (Thum & Hauser, 2015). The results of proficiency

projection and corresponding probability of achieving “Proficient” on the NeSA tests are presented in Tables 6 to 8. These tables estimate the probability of scoring at Level 2 or above on NeSA in the spring and the prior fall or winter testing season. For example, if a 3rd grade student obtained a MAP math score of 190 in the fall, the probability of obtaining a Level 2 or higher NeSA score in the spring of 3rd grade is 78%. Table 6 presents the estimated probability of meeting Level 2 benchmark when MAP is taken in the spring, whereas Tables 7 and 8 present the estimated probability of meeting Level 2 benchmark when MAP is taken in the fall or winter prior to taking the NeSA tests.

TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING NESAS LEVEL 2 (MEETS) WHEN MAP IS TAKEN IN THE SPRING

Grade	Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 2	Prob.			Cut Score	Level 2	Prob.
3	5	174	192	No	<0.01	5	181	198	No	<0.01
	10	179	192	No	<0.01	10	186	198	No	<0.01
	15	183	192	No	<0.01	15	189	198	No	<0.01
	20	186	192	No	0.03	20	192	198	No	0.02
	25	188	192	No	0.11	25	194	198	No	0.08
	30	191	192	No	0.38	30	196	198	No	0.25
	35	193	192	Yes	0.62	35	198	198	Yes	0.50
	40	195	192	Yes	0.83	40	200	198	Yes	0.75
	45	197	192	Yes	0.94	45	202	198	Yes	0.92
	50	199	192	Yes	0.99	50	203	198	Yes	0.96
	55	201	192	Yes	>0.99	55	205	198	Yes	0.99
	60	202	192	Yes	>0.99	60	207	198	Yes	>0.99
	65	204	192	Yes	>0.99	65	209	198	Yes	>0.99
	70	207	192	Yes	>0.99	70	211	198	Yes	>0.99
	75	209	192	Yes	>0.99	75	213	198	Yes	>0.99
	4	5	181	200	No	<0.01	5	189	208	No
10		187	200	No	<0.01	10	194	208	No	<0.01
15		190	200	No	<0.01	15	198	208	No	<0.01
20		193	200	No	0.01	20	201	208	No	0.01
25		196	200	No	0.11	25	203	208	No	0.04
30		198	200	No	0.27	30	206	208	No	0.25
35		200	200	Yes	0.50	35	208	208	Yes	0.50
40		202	200	Yes	0.73	40	210	208	Yes	0.75
45		204	200	Yes	0.89	45	212	208	Yes	0.92
50		206	200	Yes	0.97	50	213	208	Yes	0.96
55		208	200	Yes	0.99	55	215	208	Yes	0.99
60		210	200	Yes	>0.99	60	217	208	Yes	>0.99
65		212	200	Yes	>0.99	65	219	208	Yes	>0.99
70		214	200	Yes	>0.99	70	221	208	Yes	>0.99
75		216	200	Yes	>0.99	75	224	208	Yes	>0.99
80		218	200	Yes	>0.99	80	226	208	Yes	>0.99
85	221	200	Yes	>0.99	85	229	208	Yes	>0.99	
90	225	200	Yes	>0.99	90	233	208	Yes	>0.99	
95	230	200	Yes	>0.99	95	238	208	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 2	Prob.			Cut Score	Level 2	Prob.
5	5	188	205	No	<0.01	5	195	215	No	<0.01
	10	193	205	No	<0.01	10	201	215	No	<0.01
	15	197	205	No	0.01	15	205	215	No	<0.01
	20	199	205	No	0.03	20	208	215	No	0.01
	25	202	205	No	0.17	25	210	215	No	0.04
	30	204	205	No	0.38	30	213	215	No	0.25
	35	206	205	Yes	0.62	35	215	215	Yes	0.50
	40	208	205	Yes	0.83	40	217	215	Yes	0.75
	45	210	205	Yes	0.94	45	219	215	Yes	0.92
	50	212	205	Yes	0.99	50	221	215	Yes	0.98
	55	214	205	Yes	>0.99	55	223	215	Yes	>0.99
	60	216	205	Yes	>0.99	60	225	215	Yes	>0.99
	65	217	205	Yes	>0.99	65	228	215	Yes	>0.99
	70	220	205	Yes	>0.99	70	230	215	Yes	>0.99
	75	222	205	Yes	>0.99	75	232	215	Yes	>0.99
	80	224	205	Yes	>0.99	80	235	215	Yes	>0.99
85	227	205	Yes	>0.99	85	238	215	Yes	>0.99	
90	231	205	Yes	>0.99	90	242	215	Yes	>0.99	
95	236	205	Yes	>0.99	95	248	215	Yes	>0.99	
6	5	192	210	No	<0.01	5	198	221	No	<0.01
	10	197	210	No	<0.01	10	204	221	No	<0.01
	15	201	210	No	<0.01	15	208	221	No	<0.01
	20	203	210	No	0.01	20	211	221	No	<0.01
	25	206	210	No	0.11	25	214	221	No	0.01
	30	208	210	No	0.27	30	217	221	No	0.08
	35	210	210	Yes	0.50	35	219	221	No	0.25
	40	212	210	Yes	0.73	40	221	221	Yes	0.50
	45	214	210	Yes	0.89	45	223	221	Yes	0.75
	50	216	210	Yes	0.97	50	225	221	Yes	0.92
	55	218	210	Yes	0.99	55	227	221	Yes	0.98
	60	219	210	Yes	>0.99	60	230	221	Yes	>0.99
	65	221	210	Yes	>0.99	65	232	221	Yes	>0.99
	70	223	210	Yes	>0.99	70	234	221	Yes	>0.99
	75	226	210	Yes	>0.99	75	237	221	Yes	>0.99
	80	228	210	Yes	>0.99	80	239	221	Yes	>0.99
85	231	210	Yes	>0.99	85	243	221	Yes	>0.99	
90	235	210	Yes	>0.99	90	247	221	Yes	>0.99	
95	240	210	Yes	>0.99	95	253	221	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 2	Prob.			Cut Score	Level 2	Prob.
7	5	193	211	No	<0.01	5	199	224	No	<0.01
	10	199	211	No	<0.01	10	206	224	No	<0.01
	15	202	211	No	<0.01	15	210	224	No	<0.01
	20	205	211	No	0.03	20	214	224	No	<0.01
	25	208	211	No	0.17	25	217	224	No	0.01
	30	210	211	No	0.38	30	219	224	No	0.04
	35	212	211	Yes	0.62	35	222	224	No	0.25
	40	214	211	Yes	0.83	40	224	224	Yes	0.50
	45	216	211	Yes	0.94	45	226	224	Yes	0.75
	50	218	211	Yes	0.99	50	229	224	Yes	0.96
	55	220	211	Yes	>0.99	55	231	224	Yes	0.99
	60	222	211	Yes	>0.99	60	233	224	Yes	>0.99
	65	224	211	Yes	>0.99	65	235	224	Yes	>0.99
	70	226	211	Yes	>0.99	70	238	224	Yes	>0.99
	75	228	211	Yes	>0.99	75	241	224	Yes	>0.99
	80	231	211	Yes	>0.99	80	244	224	Yes	>0.99
	85	234	211	Yes	>0.99	85	247	224	Yes	>0.99
90	238	211	Yes	>0.99	90	251	224	Yes	>0.99	
95	243	211	Yes	>0.99	95	258	224	Yes	>0.99	
8	5	194	215	No	<0.01	5	199	229	No	<0.01
	10	200	215	No	<0.01	10	206	229	No	<0.01
	15	204	215	No	<0.01	15	211	229	No	<0.01
	20	207	215	No	0.01	20	215	229	No	<0.01
	25	209	215	No	0.03	25	218	229	No	<0.01
	30	212	215	No	0.17	30	221	229	No	<0.01
	35	214	215	No	0.38	35	224	229	No	0.04
	40	216	215	Yes	0.62	40	226	229	No	0.15
	45	218	215	Yes	0.83	45	229	229	Yes	0.50
	50	220	215	Yes	0.94	50	231	229	Yes	0.75
	55	222	215	Yes	0.99	55	233	229	Yes	0.92
	60	224	215	Yes	>0.99	60	236	229	Yes	0.99
	65	226	215	Yes	>0.99	65	238	229	Yes	>0.99
	70	228	215	Yes	>0.99	70	241	229	Yes	>0.99
	75	231	215	Yes	>0.99	75	244	229	Yes	>0.99
	80	233	215	Yes	>0.99	80	247	229	Yes	>0.99
	85	236	215	Yes	>0.99	85	251	229	Yes	>0.99
90	240	215	Yes	>0.99	90	255	229	Yes	>0.99	
95	246	215	Yes	>0.99	95	262	229	Yes	>0.99	

Note. %ile=percentile

TABLE 7. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING NESA READING LEVEL 2 (MEETS) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING NESA TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 2	Prob.			Cut Score	Level 2	Prob.
3	5	162	192	No	0.02	5	171	192	No	<0.01
	10	168	192	No	0.08	10	176	192	No	0.01
	15	172	192	No	0.16	15	180	192	No	0.06
	20	175	192	No	0.24	20	183	192	No	0.17
	25	178	192	No	0.39	25	185	192	No	0.28
	30	180	192	Yes	0.50	30	188	192	Yes	0.50
	35	182	192	Yes	0.56	35	190	192	Yes	0.58
	40	184	192	Yes	0.66	40	192	192	Yes	0.72
	45	186	192	Yes	0.76	45	194	192	Yes	0.83
	50	188	192	Yes	0.80	50	196	192	Yes	0.91
	55	190	192	Yes	0.87	55	198	192	Yes	0.96
	60	192	192	Yes	0.92	60	199	192	Yes	0.97
	65	194	192	Yes	0.94	65	201	192	Yes	0.99
	70	197	192	Yes	0.97	70	204	192	Yes	>0.99
	75	199	192	Yes	0.99	75	206	192	Yes	>0.99
	80	202	192	Yes	0.99	80	208	192	Yes	>0.99
	85	205	192	Yes	>0.99	85	211	192	Yes	>0.99
90	209	192	Yes	>0.99	90	215	192	Yes	>0.99	
95	214	192	Yes	>0.99	95	221	192	Yes	>0.99	
4	5	173	200	No	0.01	5	179	200	No	<0.01
	10	178	200	No	0.05	10	184	200	No	0.01
	15	182	200	No	0.12	15	188	200	No	0.04
	20	185	200	No	0.23	20	191	200	No	0.12
	25	188	200	No	0.33	25	194	200	No	0.28
	30	190	200	No	0.44	30	196	200	No	0.42
	35	192	200	Yes	0.56	35	198	200	Yes	0.58
	40	194	200	Yes	0.62	40	200	200	Yes	0.72
	45	196	200	Yes	0.73	45	202	200	Yes	0.78
	50	198	200	Yes	0.82	50	204	200	Yes	0.88
	55	200	200	Yes	0.85	55	205	200	Yes	0.92
	60	202	200	Yes	0.91	60	207	200	Yes	0.96
	65	204	200	Yes	0.95	65	209	200	Yes	0.98
	70	206	200	Yes	0.97	70	211	200	Yes	0.99
	75	209	200	Yes	0.99	75	214	200	Yes	>0.99
	80	211	200	Yes	0.99	80	216	200	Yes	>0.99
	85	214	200	Yes	>0.99	85	219	200	Yes	>0.99
90	218	200	Yes	>0.99	90	223	200	Yes	>0.99	
95	224	200	Yes	>0.99	95	228	200	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 2	Prob.			Cut-Score	Level 2	Prob.
5	5	181	205	No	0.02	5	186	205	No	<0.01
	10	186	205	No	0.07	10	191	205	No	0.02
	15	190	205	No	0.15	15	195	205	No	0.09
	20	193	205	No	0.28	20	197	205	No	0.17
	25	195	205	No	0.38	25	200	205	No	0.35
	30	198	205	Yes	0.50	30	202	205	No	0.42
	35	200	205	Yes	0.62	35	204	205	Yes	0.58
	40	202	205	Yes	0.72	40	206	205	Yes	0.72
	45	204	205	Yes	0.77	45	208	205	Yes	0.83
	50	206	205	Yes	0.85	50	210	205	Yes	0.91
	55	208	205	Yes	0.91	55	212	205	Yes	0.96
	60	210	205	Yes	0.95	60	214	205	Yes	0.98
	65	212	205	Yes	0.96	65	215	205	Yes	0.99
	70	214	205	Yes	0.98	70	218	205	Yes	>0.99
	75	216	205	Yes	0.99	75	220	205	Yes	>0.99
	80	218	205	Yes	0.99	80	222	205	Yes	>0.99
	85	221	205	Yes	>0.99	85	225	205	Yes	>0.99
90	225	205	Yes	>0.99	90	229	205	Yes	>0.99	
95	231	205	Yes	>0.99	95	234	205	Yes	>0.99	
6	5	186	210	No	0.01	5	190	210	No	<0.01
	10	192	210	No	0.06	10	196	210	No	0.02
	15	196	210	No	0.16	15	199	210	No	0.04
	20	198	210	No	0.19	20	202	210	No	0.12
	25	201	210	No	0.33	25	204	210	No	0.22
	30	203	210	No	0.44	30	207	210	No	0.42
	35	205	210	Yes	0.56	35	209	210	Yes	0.58
	40	207	210	Yes	0.61	40	211	210	Yes	0.72
	45	209	210	Yes	0.72	45	212	210	Yes	0.78
	50	211	210	Yes	0.81	50	214	210	Yes	0.88
	55	213	210	Yes	0.88	55	216	210	Yes	0.91
	60	215	210	Yes	0.90	60	218	210	Yes	0.96
	65	217	210	Yes	0.94	65	220	210	Yes	0.98
	70	219	210	Yes	0.97	70	222	210	Yes	0.99
	75	221	210	Yes	0.98	75	224	210	Yes	>0.99
	80	224	210	Yes	0.99	80	226	210	Yes	>0.99
	85	226	210	Yes	>0.99	85	229	210	Yes	>0.99
90	230	210	Yes	>0.99	90	233	210	Yes	>0.99	
95	236	210	Yes	>0.99	95	238	210	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 2	Prob.			Cut-Score	Level 2	Prob.
7	5	189	211	No	0.01	5	192	211	No	<0.01
	10	195	211	No	0.07	10	198	211	No	0.02
	15	199	211	No	0.19	15	201	211	No	0.06
	20	202	211	No	0.28	20	204	211	No	0.17
	25	204	211	No	0.39	25	207	211	No	0.35
	30	206	211	Yes	0.50	30	209	211	Yes	0.50
	35	209	211	Yes	0.61	35	211	211	Yes	0.65
	40	211	211	Yes	0.72	40	213	211	Yes	0.72
	45	213	211	Yes	0.81	45	215	211	Yes	0.83
	50	214	211	Yes	0.85	50	217	211	Yes	0.91
	55	216	211	Yes	0.88	55	219	211	Yes	0.96
	60	218	211	Yes	0.93	60	221	211	Yes	0.98
	65	220	211	Yes	0.96	65	223	211	Yes	0.99
	70	222	211	Yes	0.98	70	225	211	Yes	>0.99
	75	225	211	Yes	0.99	75	227	211	Yes	>0.99
	80	227	211	Yes	>0.99	80	230	211	Yes	>0.99
	85	230	211	Yes	>0.99	85	232	211	Yes	>0.99
90	234	211	Yes	>0.99	90	236	211	Yes	>0.99	
95	240	211	Yes	>0.99	95	242	211	Yes	>0.99	
8	5	191	215	No	0.01	5	194	215	No	<0.01
	10	197	215	No	0.06	10	199	215	No	0.01
	15	201	215	No	0.13	15	203	215	No	0.03
	20	204	215	No	0.22	20	206	215	No	0.10
	25	207	215	No	0.31	25	209	215	No	0.18
	30	209	215	No	0.40	30	211	215	No	0.29
	35	211	215	Yes	0.50	35	213	215	No	0.43
	40	213	215	Yes	0.55	40	215	215	Yes	0.57
	45	215	215	Yes	0.65	45	217	215	Yes	0.71
	50	217	215	Yes	0.74	50	219	215	Yes	0.82
	55	219	215	Yes	0.81	55	221	215	Yes	0.90
	60	221	215	Yes	0.84	60	223	215	Yes	0.95
	65	223	215	Yes	0.90	65	225	215	Yes	0.98
	70	225	215	Yes	0.94	70	227	215	Yes	0.99
	75	228	215	Yes	0.96	75	229	215	Yes	>0.99
	80	230	215	Yes	0.98	80	232	215	Yes	>0.99
	85	234	215	Yes	0.99	85	235	215	Yes	>0.99
90	237	215	Yes	>0.99	90	239	215	Yes	>0.99	
95	243	215	Yes	>0.99	95	244	215	Yes	>0.99	

Note. %ile=percentile

TABLE 8. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING NESA MATH LEVEL 2 (MEETS) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING NESA TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 2	Prob.			Cut Score	Level 2	Prob.
3	5	169	198	No	0.01	5	176	198	No	<0.01
	10	174	198	No	0.06	10	181	198	No	0.01
	15	177	198	No	0.14	15	184	198	No	0.05
	20	179	198	No	0.22	20	187	198	No	0.10
	25	182	198	No	0.38	25	189	198	No	0.20
	30	184	198	No	0.44	30	191	198	No	0.34
	35	185	198	Yes	0.50	35	193	198	Yes	0.50
	40	187	198	Yes	0.62	40	195	198	Yes	0.66
	45	189	198	Yes	0.73	45	197	198	Yes	0.80
	50	190	198	Yes	0.78	50	198	198	Yes	0.86
	55	192	198	Yes	0.86	55	200	198	Yes	0.93
	60	194	198	Yes	0.92	60	202	198	Yes	0.97
	65	195	198	Yes	0.94	65	203	198	Yes	0.98
	70	197	198	Yes	0.97	70	205	198	Yes	0.99
	75	199	198	Yes	0.98	75	207	198	Yes	>0.99
	80	201	198	Yes	0.99	80	209	198	Yes	>0.99
	85	204	198	Yes	>0.99	85	212	198	Yes	>0.99
90	207	198	Yes	>0.99	90	215	198	Yes	>0.99	
95	212	198	Yes	>0.99	95	220	198	Yes	>0.99	
4	5	179	208	No	<0.01	5	185	208	No	<0.01
	10	184	208	No	0.03	10	190	208	No	<0.01
	15	188	208	No	0.11	15	194	208	No	0.03
	20	190	208	No	0.17	20	197	208	No	0.10
	25	193	208	No	0.32	25	199	208	No	0.20
	30	195	208	No	0.44	30	201	208	No	0.34
	35	197	208	Yes	0.56	35	203	208	Yes	0.50
	40	198	208	Yes	0.62	40	205	208	Yes	0.66
	45	200	208	Yes	0.73	45	207	208	Yes	0.80
	50	202	208	Yes	0.83	50	209	208	Yes	0.90
	55	204	208	Yes	0.89	55	211	208	Yes	0.95
	60	205	208	Yes	0.89	60	212	208	Yes	0.97
	65	207	208	Yes	0.94	65	214	208	Yes	0.99
	70	209	208	Yes	0.97	70	216	208	Yes	>0.99
	75	211	208	Yes	0.99	75	218	208	Yes	>0.99
	80	214	208	Yes	>0.99	80	221	208	Yes	>0.99
	85	216	208	Yes	>0.99	85	223	208	Yes	>0.99
90	220	208	Yes	>0.99	90	227	208	Yes	>0.99	
95	225	208	Yes	>0.99	95	232	208	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 2	Prob.			Cut-Score	Level 2	Prob.
5	5	187	215	No	<0.01	5	192	215	No	<0.01
	10	193	215	No	0.04	10	198	215	No	<0.01
	15	196	215	No	0.09	15	201	215	No	0.02
	20	199	215	No	0.19	20	204	215	No	0.07
	25	202	215	No	0.33	25	207	215	No	0.20
	30	204	215	No	0.44	30	209	215	No	0.34
	35	206	215	Yes	0.56	35	211	215	Yes	0.50
	40	208	215	Yes	0.67	40	213	215	Yes	0.66
	45	210	215	Yes	0.77	45	215	215	Yes	0.80
	50	211	215	Yes	0.81	50	217	215	Yes	0.89
	55	213	215	Yes	0.88	55	219	215	Yes	0.95
	60	215	215	Yes	0.93	60	221	215	Yes	0.98
	65	217	215	Yes	0.96	65	223	215	Yes	0.99
	70	219	215	Yes	0.98	70	225	215	Yes	>0.99
	75	221	215	Yes	0.99	75	228	215	Yes	>0.99
	80	224	215	Yes	>0.99	80	230	215	Yes	>0.99
	85	227	215	Yes	>0.99	85	233	215	Yes	>0.99
90	230	215	Yes	>0.99	90	237	215	Yes	>0.99	
95	236	215	Yes	>0.99	95	242	215	Yes	>0.99	
6	5	192	221	No	<0.01	5	196	221	No	<0.01
	10	198	221	No	0.01	10	202	221	No	<0.01
	15	202	221	No	0.05	15	205	221	No	<0.01
	20	205	221	No	0.12	20	209	221	No	0.03
	25	207	221	No	0.19	25	211	221	No	0.07
	30	209	221	No	0.28	30	214	221	No	0.20
	35	212	221	No	0.44	35	216	221	No	0.34
	40	214	221	Yes	0.56	40	218	221	Yes	0.50
	45	216	221	Yes	0.67	45	220	221	Yes	0.66
	50	218	221	Yes	0.77	50	222	221	Yes	0.80
	55	220	221	Yes	0.85	55	224	221	Yes	0.89
	60	222	221	Yes	0.91	60	226	221	Yes	0.95
	65	224	221	Yes	0.95	65	228	221	Yes	0.98
	70	226	221	Yes	0.97	70	230	221	Yes	0.99
	75	228	221	Yes	0.99	75	233	221	Yes	>0.99
	80	231	221	Yes	>0.99	80	236	221	Yes	>0.99
	85	234	221	Yes	>0.99	85	239	221	Yes	>0.99
90	238	221	Yes	>0.99	90	243	221	Yes	>0.99	
95	243	221	Yes	>0.99	95	248	221	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 2	Prob.			Cut-Score	Level 2	Prob.
7	5	195	224	No	<0.01	5	198	224	No	<0.01
	10	201	224	No	<0.01	10	204	224	No	<0.01
	15	205	224	No	0.02	15	208	224	No	<0.01
	20	209	224	No	0.08	20	212	224	No	0.02
	25	211	224	No	0.14	25	215	224	No	0.07
	30	214	224	No	0.27	30	217	224	No	0.15
	35	216	224	No	0.38	35	220	224	No	0.34
	40	218	224	Yes	0.50	40	222	224	Yes	0.50
	45	221	224	Yes	0.68	45	224	224	Yes	0.66
	50	223	224	Yes	0.78	50	226	224	Yes	0.80
	55	225	224	Yes	0.86	55	228	224	Yes	0.90
	60	227	224	Yes	0.92	60	230	224	Yes	0.95
	65	229	224	Yes	0.95	65	233	224	Yes	0.99
	70	231	224	Yes	0.98	70	235	224	Yes	>0.99
	75	234	224	Yes	0.99	75	238	224	Yes	>0.99
	80	237	224	Yes	>0.99	80	240	224	Yes	>0.99
	85	240	224	Yes	>0.99	85	244	224	Yes	>0.99
90	244	224	Yes	>0.99	90	248	224	Yes	>0.99	
95	250	224	Yes	>0.99	95	254	224	Yes	>0.99	
8	5	197	229	No	<0.01	5	199	229	No	<0.01
	10	203	229	No	<0.01	10	206	229	No	<0.01
	15	208	229	No	0.02	15	210	229	No	<0.01
	20	211	229	No	0.04	20	214	229	No	<0.01
	25	214	229	No	0.10	25	217	229	No	0.02
	30	217	229	No	0.18	30	220	229	No	0.08
	35	219	229	No	0.26	35	222	229	No	0.16
	40	222	229	No	0.40	40	225	229	No	0.35
	45	224	229	Yes	0.50	45	227	229	Yes	0.50
	50	226	229	Yes	0.60	50	229	229	Yes	0.65
	55	229	229	Yes	0.74	55	231	229	Yes	0.79
	60	231	229	Yes	0.82	60	234	229	Yes	0.92
	65	233	229	Yes	0.88	65	236	229	Yes	0.96
	70	236	229	Yes	0.92	70	239	229	Yes	0.99
	75	238	229	Yes	0.96	75	241	229	Yes	>0.99
	80	241	229	Yes	0.98	80	245	229	Yes	>0.99
	85	245	229	Yes	>0.99	85	248	229	Yes	>0.99
90	249	229	Yes	>0.99	90	253	229	Yes	>0.99	
95	256	229	Yes	>0.99	95	259	229	Yes	>0.99	

Note. %ile=percentile

Summary and Discussion

This study produced a set of cut scores on MAP reading and math tests for Grades 3 to 8 that correspond to each NeSA performance level. By using matched score data from a sample of students from Nebraska, the study demonstrates that MAP scores can accurately predict whether a student could be Proficient or above on the basis of his/her MAP scores. This study also used the 2015 NWEA norming study results to project a student's probability to meet proficiency based on that student's prior MAP scores in fall and winter. These results will help educators predict student performance in NeSA tests as early as possible and identify those students who are at risk of failing to meet required standards so that they can receive necessary resources and assistance to meet their goals.

While concordance tables can be helpful and informative, they have general limitations. First, the concordance tables provide information about score comparability on different tests, but the scores cannot be assumed to be interchangeable. In the case for NeSA and MAP tests, as they are not parallel in content, scores from these two tests should not be directly compared. Second, while the sample data used in this study were collected from 5 school districts in Nebraska, caution should be exercised when generalizing the results to test takers who differ significantly from this sample. Finally, caution should also be exercised if the concorded scores are used for a subpopulation. NWEA will continue to gather information about NeSA performance from other school districts in Nebraska to enhance the quality and generalizability of the study.

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Appendix

Data and Analysis

Data

Data used in this study were collected from 5 school districts in Nebraska. The sample contained matched NeSA and MAP reading scores of 9,773 students in Grades 3 to 8 and matched NeSA and MAP math scores of 9,813 students in Grades 3 to 8 who completed both MAP and NeSA tests in the spring of 2015.

To understand the statistical characteristics of the test scores, descriptive statistics are provided in Table A1 below. As Table A1 indicates, the correlation coefficients between MAP and NeSA reading scores range from 0.79 to 0.82, and the correlation coefficients between MAP and NeSA math scores range from 0.83 to 0.86. In general, all these correlations indicate a strong relationship between MAP and NeSA test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

Subject	Grade	N	<i>r</i>	NeSA				MAP			
				Mean	SD	Min	Max	Mean	SD	Min	Max
Reading	3	1,675	0.81	121	35.49	42	200	205	13.57	149	238
	4	1,635	0.80	127	38.63	11	200	213	13.04	152	247
	5	1,698	0.81	135	41.19	12	200	218	12.78	151	250
	6	1,617	0.81	130	39.43	18	200	222	12.15	169	252
	7	1,815	0.82	135	42.84	10	200	224	13.36	149	258
	8	1,333	0.79	117	37.88	18	200	225	13.80	165	255
Math	3	1,674	0.83	115	37.23	28	200	207	11.98	155	250
	4	1,635	0.84	113	33.21	28	200	218	13.17	143	254
	5	1,700	0.86	115	36.48	25	200	227	15.45	162	272
	6	1,618	0.84	118	36.60	28	200	231	13.49	161	273
	7	1,821	0.86	118	39.24	27	200	235	15.81	159	282
	8	1,365	0.85	108	37.69	21	200	237	16.92	143	289

Equipercntile Linking Procedure

The equipercntile procedure (e.g., Kolen & Brennan, 2004) was used to establish the concordance relationship between NeSA and MAP scores for grades 3 to 8 in reading and math. This procedure matches scores on the two scales that have the same percntile rank (i.e., the proportion of scores at or below each score).

Suppose we need to establish the concorded scores between two tests. x is a score on Test X (e.g., NeSA). Its equipercntile equivalent score on Test Y (e.g., MAP), $e_y(x)$, can be obtained through a cumulative-distribution-based linking function defined in Equation (A1):

$$e_y(x) = G^{-1}[P(x)] \quad (\text{A1})$$

where $e_y(x)$ is the equipercntile equivalent of scores on NeSA on the scale of MAP, $P(x)$ is the percntile rank of a given score on Test X . G^{-1} is the inverse of the percntile rank function for scores on Test Y which indicates the scores on Test Y corresponding to a given percntile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the frequency distributions as well as equipercntile linking curve.

Consistency Rate of Classification

Consistency rate of classification accuracy, expressed in the form of a rate between 0 and 1, measures the extent to which MAP scores (and the estimated MAP cut scores) accurately predicted whether students in the sample would pass (i.e., Level 2 or higher) on NeSA tests.

To calculate consistency rate of classification, sample students were designated “Below NeSA cut” or “At or above NeSA cut” based on their actual NeSA scores. Similarly, they were also designated as “Below MAP cut” or “At or above MAP cut” based on their actual MAP scores. A 2-way contingency table was then tabulated (see Table A2), classifying students as “Proficient” on the basis of NeSA cut score and concordant MAP cut score. Students classified in the *true positive* (TP) category were those predicted to be Proficient based on the MAP cut scores and were also classified as Proficient based on the NeSA cut scores. Students classified in the *true negative* (TN) category were those predicted to be Not Proficient based on the MAP cut scores and were also classified as Not Proficient based on the NeSA cut scores. Students classified in the *false positive* (FP) category were those predicted to be Proficient based on the MAP cut scores but were classified as Not Proficient based on the NeSA cut scores. Students classified in the *false negative* (FN) category were those predicted to be Not Proficient based on the MAP cut scores but were classified as Proficient based on the NeSA cut scores. The overall consistency rate of classification was computed as the proportion of correct classifications among the entire sample by $(TP+TN) / (TP+TN+FP+FN)$.

TABLE A2. DEFINITION OF CONSISTENCY RATE FOR NESAs TO MAP CONCORDANCE

		NeSA Score	
		Below NeSA cut	At or Above NeSA cut
MAP Score	Below MAP cut	True Negative	False Negative
	At or Above MAP cut	False Positive	True Positive

Note. Shaded cells are summed to compute the consistency rate.

Proficiency Projection

MAP conditional growth norms provide student’s expected gain scores across testing seasons (Thum & Hauser, 2015). This information is utilized to predict a student’s performance on the NeSA based on that student’s MAP scores in prior seasons (e.g. fall and winter). The probability of a student achieving Level 2 (Meets) on NeSA, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(\text{Achieving Level 2 in spring} | a \text{ RIT score of } x) = \Phi\left(\frac{x + g - c}{SD}\right) \quad (A2)$$

where, Φ is a standardized normal cumulative distribution, x is the student’s RIT score in fall or winter, g is the expected growth from fall or winter to spring corresponding to x , c is the MAP cut-score for spring, and SD is the conditional standard deviation of growth from fall or winter to spring.

For the probability of a student achieving Level 2 on the NeSA tests, based on his/her spring score s , it can be calculated by Equation (A3):

$$Pr(\text{Achieving Level 2 in spring} | a \text{ RIT score of } s \text{ in spring}) = \Phi\left(\frac{s - c}{SE}\right) \quad (A3)$$

where SE is the standard error of measurement for MAP reading or math test.

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