

# Linking the Texas STAAR Assessments to NWEA MAP Tests

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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 State of Texas Assessments of Academic Readiness™ (STAAR™) reading and math with those of the MAP Reading and MAP for Mathematics assessments. In this report, we present the 3<sup>rd</sup> through 8<sup>th</sup> grade cut scores on MAP reading and mathematics scales that correspond to the benchmarks on the STAAR 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 II (i.e., “Satisfactory”) or higher performance designation on the STAAR 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

STAAR includes a series of vertically scaled achievement tests aligned to the Texas state curriculum, the Texas Essential Knowledge and Skills (TEKS) in math and reading for grades 3-8, writing for grades 4 and 7, science for grades 5 and 8, social science for grades 5 and 8 and end-of-course assessments for English I, English II, Algebra I, biology, and U.S history. STAAR tests can be delivered online or in the paper-and-pencil form. For each grade and subject, there are two cut scores that distinguish between performance levels: Level I: *Unsatisfactory Academic Performance*, Level II: *Satisfactory Academic Performance* and Level III: *Advanced Academic Performance*. The Level II cut score demarks the minimum level of performance considered to be “Proficient” for accountability purposes.

MAP tests are vertically scaled interim assessments that are administered in the form of a computerized adaptive test (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 TEKS standards. 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 STAAR Readiness Levels

Tables 1 to 4 report the STAAR scaled scores associated with each of the three performance levels, as well as the estimated cut scores on the MAP tests associated with the STAAR performance levels. 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 STAAR performance level, based on their observed MAP scores. For example, a 6<sup>th</sup> grade student who obtained a MAP math score of 240 in the spring testing season is likely to be at the very high end of Level II (Satisfactory) on the STAAR taken during that same testing season (see Table 2). Similarly, a 3<sup>rd</sup> grade student who obtained a MAP reading score of 210 in the fall testing season is likely to be at Level III (Advanced) on the STAAR taken in the spring of 3<sup>rd</sup> grade (see Table 3).

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

Grade	STAAR					
	Level I <i>Unsatisfactory</i>		Level II <i>Satisfactory</i>		Level III <i>Advanced</i>	
3	700-1344		<b>1345</b> -1554		1555-2300	
4	700-1433		<b>1434</b> -1632		1633-2300	
5	700-1469		<b>1470</b> -1666		1667-2300	
6	700-1516		<b>1517</b> -1717		1718-2300	
7	700-1566		<b>1567</b> -1752		1753-2300	
8	700-1586		<b>1587</b> -1782		1783-2300	
Grade	MAP					
	Level I <i>Unsatisfactory</i>		Level II <i>Satisfactory</i>		Level III <i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-193	1-36	<b>194</b> -213	37-83	214-350	84-99
4	100-201	1-38	<b>202</b> -220	39-83	221-350	84-99
5	100-206	1-35	<b>207</b> -225	36-82	226-350	83-99
6	100-207	1-28	<b>208</b> -229	29-82	230-350	83-99
7	100-210	1-30	<b>211</b> -232	31-82	233-350	83-99
8	100-210	1-27	<b>211</b> -234	28-82	235-350	83-99

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 STAAR AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

Grade	STAAR					
	Level I <i>Unsatisfactory</i>		Level II <i>Satisfactory</i>		Level III <i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	700-1359		<b>1360</b> -1595		1596-2300	
4	700-1466		<b>1467</b> -1669		1670-2300	
5	700-1499		<b>1500</b> -1723		1724-2300	
6	700-1535		<b>1536</b> -1771		1772-2300	
7	700-1574		<b>1575</b> -1797		1798-2300	
8	700-1594		<b>1595</b> -1853		1854-2300	
Grade	MAP					
	Level I <i>Unsatisfactory</i>		Level II <i>Satisfactory</i>		Level III <i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-198	1-36	<b>199</b> -219	37-87	220-350	88-99
4	100-211	1-44	<b>212</b> -232	45-89	233-350	90-99
5	100-214	1-33	<b>215</b> -239	34-86	240-350	87-99
6	100-217	1-31	<b>218</b> -243	32-86	244-350	87-99
7	100-221	1-34	<b>222</b> -249	35-88	250-350	89-99
8	100-222	1-32	<b>223</b> -257	33-91	258-350	92-99

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 STAAR AND MAP READING (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING STAAR TESTS)

Grade	STAAR					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
3	700-1344		<b>1345</b> -1554		1555-2300	
4	700-1433		<b>1434</b> -1632		1633-2300	
5	700-1469		<b>1470</b> -1666		1667-2300	
6	700-1516		<b>1517</b> -1717		1718-2300	
7	700-1566		<b>1567</b> -1752		1753-2300	
8	700-1586		<b>1587</b> -1782		1783-2300	

  

Grade	MAP FALL					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-182	1-35	<b>183</b> -206	36-87	207-350	88-99
4	100-193	1-38	<b>194</b> -215	39-86	216-350	87-99
5	100-199	1-34	<b>200</b> -221	35-85	222-350	86-99
6	100-201	1-26	<b>202</b> -226	27-85	227-350	86-99
7	100-205	1-27	<b>206</b> -230	28-85	231-350	86-99
8	100-206	1-24	<b>207</b> -232	25-83	233-350	84-99

  

Grade	MAP WINTER					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-190	1-36	<b>191</b> -211	37-85	212-350	86-99
4	100-198	1-36	<b>199</b> -219	37-85	220-350	86-99
5	100-204	1-35	<b>205</b> -224	36-84	225-350	85-99
6	100-205	1-27	<b>206</b> -228	28-83	229-350	84-99
7	100-208	1-28	<b>209</b> -231	29-83	232-350	84-99
8	100-209	1-26	<b>210</b> -233	27-82	234-350	83-99

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 STAAR AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING STAAR TESTS)

Grade	STAAR					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
3	700-1359		<b>1360</b> -1595		1596-2300	
4	700-1466		<b>1467</b> -1669		1670-2300	
5	700-1499		<b>1500</b> -1723		1724-2300	
6	700-1535		<b>1536</b> -1771		1772-2300	
7	700-1574		<b>1575</b> -1797		1798-2300	
8	700-1594		<b>1595</b> -1853		1854-2300	

  

Grade	MAP FALL					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-185	1-35	<b>186</b> -207	36-90	208-350	91-99
4	100-199	1-42	<b>200</b> -221	43-92	222-350	93-99
5	100-204	1-31	<b>205</b> -229	32-89	230-350	90-99
6	100-209	1-30	<b>210</b> -236	31-88	237-350	89-99
7	100-215	1-33	<b>216</b> -243	34-89	244-350	90-99
8	100-217	1-31	<b>218</b> -253	32-93	254-350	94-99

  

Grade	MAP WINTER					
	Level I		Level II		Level III	
	<i>Unsatisfactory</i>		<i>Satisfactory</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile
3	100-193	1-36	<b>194</b> -214	37-88	215-350	89-99
4	100-206	1-43	<b>207</b> -227	44-90	228-350	91-99
5	100-210	1-33	<b>211</b> -235	34-88	236-350	89-99
6	100-214	1-31	<b>215</b> -240	32-87	241-350	88-99
7	100-219	1-34	<b>220</b> -247	35-89	248-350	90-99
8	100-220	1-31	<b>221</b> -255	32-92	256-350	93-99

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 STAAR 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 STAAR and MAP cut scores. The results in Table 5 demonstrate that on average MAP reading scores can consistently classify students’ proficiency (Level II or higher) status on STAAR reading test 87% of the time and MAP math scores can consistently classify students on STAAR math test 87% 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 STAAR tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND STAAR LEVEL II EQUIPERCENTILE CONCORDANCES

Grade	Reading			Math		
	Consistency Rate	False		Consistency Rate	False	
		Positives	Negatives		Positives	Negatives
3	0.89	0.06	0.05	0.90	0.08	0.02
4	0.88	0.08	0.04	0.89	0.07	0.04
5	0.88	0.07	0.05	0.90	0.05	0.05
6	0.87	0.07	0.06	0.88	0.07	0.05
7	0.86	0.07	0.07	0.86	0.09	0.05
8	0.84	0.08	0.08	0.79	0.12	0.09

## Proficiency Projection

Proficiency projection tells how likely a student is classified as “proficient” on STAAR 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 STAAR tests are



presented in Tables 6 to 8. These tables estimate the probability of scoring at Level II or above on STAAR in the spring and the prior fall or winter testing season. For example, if a 3<sup>rd</sup> grade student obtained a MAP math score of 190 in the fall, the probability of obtaining a Level II or higher STAAR score in the spring of 3<sup>rd</sup> grade is 73%. Table 6 presents the estimated probability of meeting Level II benchmark when MAP is taken in the spring, whereas Tables 7 and 8 present the estimated probability of meeting Level II benchmark when MAP is taken in the fall or winter prior to taking the STAAR tests.

**TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING STAAR LEVEL II (SATISFACTORY) 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 II	Prob.			Cut Score	Level II	Prob.
3	5	174	194	No	<0.01	5	181	199	No	<0.01
	10	179	194	No	<0.01	10	186	199	No	<0.01
	15	183	194	No	<0.01	15	189	199	No	<0.01
	20	186	194	No	0.01	20	192	199	No	0.01
	25	188	194	No	0.03	25	194	199	No	0.04
	30	191	194	No	0.17	30	196	199	No	0.15
	35	193	194	No	0.38	35	198	199	No	0.37
	40	195	194	Yes	0.62	40	200	199	Yes	0.63
	45	197	194	Yes	0.83	45	202	199	Yes	0.85
	50	199	194	Yes	0.94	50	203	199	Yes	0.92
	55	201	194	Yes	0.99	55	205	199	Yes	0.98
	60	202	194	Yes	0.99	60	207	199	Yes	>0.99
	65	204	194	Yes	>0.99	65	209	199	Yes	>0.99
	70	207	194	Yes	>0.99	70	211	199	Yes	>0.99
	75	209	194	Yes	>0.99	75	213	199	Yes	>0.99
	80	211	194	Yes	>0.99	80	215	199	Yes	>0.99
	85	214	194	Yes	>0.99	85	218	199	Yes	>0.99
90	218	194	Yes	>0.99	90	221	199	Yes	>0.99	
95	223	194	Yes	>0.99	95	226	199	Yes	>0.99	
4	5	181	202	No	<0.01	5	189	212	No	<0.01
	10	187	202	No	<0.01	10	194	212	No	<0.01
	15	190	202	No	<0.01	15	198	212	No	<0.01
	20	193	202	No	<0.01	20	201	212	No	<0.01
	25	196	202	No	0.03	25	203	212	No	<0.01
	30	198	202	No	0.11	30	206	212	No	0.02
	35	200	202	No	0.27	35	208	212	No	0.08
	40	202	202	Yes	0.50	40	210	212	No	0.25
	45	204	202	Yes	0.73	45	212	212	Yes	0.50
	50	206	202	Yes	0.89	50	213	212	Yes	0.63
	55	208	202	Yes	0.97	55	215	212	Yes	0.85
	60	210	202	Yes	0.99	60	217	212	Yes	0.96
	65	212	202	Yes	>0.99	65	219	212	Yes	0.99
	70	214	202	Yes	>0.99	70	221	212	Yes	>0.99
	75	216	202	Yes	>0.99	75	224	212	Yes	>0.99
	80	218	202	Yes	>0.99	80	226	212	Yes	>0.99
	85	221	202	Yes	>0.99	85	229	212	Yes	>0.99
90	225	202	Yes	>0.99	90	233	212	Yes	>0.99	
95	230	202	Yes	>0.99	95	238	212	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level II	Prob.			Cut Score	Level II	Prob.
5	5	188	207	No	<0.01	5	195	215	No	<0.01
	10	193	207	No	<0.01	10	201	215	No	<0.01
	15	197	207	No	<0.01	15	205	215	No	<0.01
	20	199	207	No	0.01	20	208	215	No	0.01
	25	202	207	No	0.06	25	210	215	No	0.04
	30	204	207	No	0.17	30	213	215	No	0.25
	35	206	207	No	0.38	35	215	215	Yes	0.50
	40	208	207	Yes	0.62	40	217	215	Yes	0.75
	45	210	207	Yes	0.83	45	219	215	Yes	0.92
	50	212	207	Yes	0.94	50	221	215	Yes	0.98
	55	214	207	Yes	0.99	55	223	215	Yes	>0.99
	60	216	207	Yes	>0.99	60	225	215	Yes	>0.99
	65	217	207	Yes	>0.99	65	228	215	Yes	>0.99
	70	220	207	Yes	>0.99	70	230	215	Yes	>0.99
	75	222	207	Yes	>0.99	75	232	215	Yes	>0.99
	80	224	207	Yes	>0.99	80	235	215	Yes	>0.99
85	227	207	Yes	>0.99	85	238	215	Yes	>0.99	
90	231	207	Yes	>0.99	90	242	215	Yes	>0.99	
95	236	207	Yes	>0.99	95	248	215	Yes	>0.99	
6	5	192	208	No	<0.01	5	198	218	No	<0.01
	10	197	208	No	<0.01	10	204	218	No	<0.01
	15	201	208	No	0.01	15	208	218	No	<0.01
	20	203	208	No	0.06	20	211	218	No	0.01
	25	206	208	No	0.27	25	214	218	No	0.08
	30	208	208	Yes	0.50	30	217	218	No	0.37
	35	210	208	Yes	0.73	35	219	218	Yes	0.63
	40	212	208	Yes	0.89	40	221	218	Yes	0.85
	45	214	208	Yes	0.97	45	223	218	Yes	0.96
	50	216	208	Yes	0.99	50	225	218	Yes	0.99
	55	218	208	Yes	>0.99	55	227	218	Yes	>0.99
	60	219	208	Yes	>0.99	60	230	218	Yes	>0.99
	65	221	208	Yes	>0.99	65	232	218	Yes	>0.99
	70	223	208	Yes	>0.99	70	234	218	Yes	>0.99
	75	226	208	Yes	>0.99	75	237	218	Yes	>0.99
	80	228	208	Yes	>0.99	80	239	218	Yes	>0.99
85	231	208	Yes	>0.99	85	243	218	Yes	>0.99	
90	235	208	Yes	>0.99	90	247	218	Yes	>0.99	
95	240	208	Yes	>0.99	95	253	218	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level II	Prob.			Cut Score	Level II	Prob.
7	5	193	211	No	<0.01	5	199	222	No	<0.01
	10	199	211	No	<0.01	10	206	222	No	<0.01
	15	202	211	No	<0.01	15	210	222	No	<0.01
	20	205	211	No	0.03	20	214	222	No	<0.01
	25	208	211	No	0.17	25	217	222	No	0.04
	30	210	211	No	0.38	30	219	222	No	0.15
	35	212	211	Yes	0.62	35	222	222	Yes	0.50
	40	214	211	Yes	0.83	40	224	222	Yes	0.75
	45	216	211	Yes	0.94	45	226	222	Yes	0.92
	50	218	211	Yes	0.99	50	229	222	Yes	0.99
	55	220	211	Yes	>0.99	55	231	222	Yes	>0.99
	60	222	211	Yes	>0.99	60	233	222	Yes	>0.99
	65	224	211	Yes	>0.99	65	235	222	Yes	>0.99
	70	226	211	Yes	>0.99	70	238	222	Yes	>0.99
	75	228	211	Yes	>0.99	75	241	222	Yes	>0.99
	8	5	194	211	No	<0.01	5	199	223	No
10		200	211	No	<0.01	10	206	223	No	<0.01
15		204	211	No	0.01	15	211	223	No	<0.01
20		207	211	No	0.11	20	215	223	No	<0.01
25		209	211	No	0.27	25	218	223	No	0.04
30		212	211	Yes	0.62	30	221	223	No	0.25
35		214	211	Yes	0.83	35	224	223	Yes	0.63
40		216	211	Yes	0.94	40	226	223	Yes	0.85
45		218	211	Yes	0.99	45	229	223	Yes	0.98
50		220	211	Yes	>0.99	50	231	223	Yes	>0.99
55		222	211	Yes	>0.99	55	233	223	Yes	>0.99
60		224	211	Yes	>0.99	60	236	223	Yes	>0.99
65		226	211	Yes	>0.99	65	238	223	Yes	>0.99
70		228	211	Yes	>0.99	70	241	223	Yes	>0.99
75		231	211	Yes	>0.99	75	244	223	Yes	>0.99
80		233	211	Yes	>0.99	80	247	223	Yes	>0.99
85	236	211	Yes	>0.99	85	251	223	Yes	>0.99	
90	240	211	Yes	>0.99	90	255	223	Yes	>0.99	
95	246	211	Yes	>0.99	95	262	223	Yes	>0.99	

Note. %ile=percentile

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

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level II	Prob.			Cut Score	Level II	Prob.
3	5	162	194	No	0.01	5	171	194	No	<0.01
	10	168	194	No	0.05	10	176	194	No	<0.01
	15	172	194	No	0.10	15	180	194	No	0.03
	20	175	194	No	0.16	20	183	194	No	0.09
	25	178	194	No	0.29	25	185	194	No	0.17
	30	180	194	No	0.39	30	188	194	No	0.35
	35	182	194	No	0.44	35	190	194	No	0.42
	40	184	194	Yes	0.56	40	192	194	Yes	0.58
	45	186	194	Yes	0.66	45	194	194	Yes	0.72
	50	188	194	Yes	0.71	50	196	194	Yes	0.83
	55	190	194	Yes	0.80	55	198	194	Yes	0.91
	60	192	194	Yes	0.87	60	199	194	Yes	0.94
	65	194	194	Yes	0.90	65	201	194	Yes	0.97
	70	197	194	Yes	0.95	70	204	194	Yes	0.99
	75	199	194	Yes	0.97	75	206	194	Yes	>0.99
	80	202	194	Yes	0.99	80	208	194	Yes	>0.99
	85	205	194	Yes	>0.99	85	211	194	Yes	>0.99
90	209	194	Yes	>0.99	90	215	194	Yes	>0.99	
95	214	194	Yes	>0.99	95	221	194	Yes	>0.99	
4	5	173	202	No	<0.01	5	179	202	No	<0.01
	10	178	202	No	0.03	10	184	202	No	<0.01
	15	182	202	No	0.07	15	188	202	No	0.02
	20	185	202	No	0.15	20	191	202	No	0.06
	25	188	202	No	0.23	25	194	202	No	0.16
	30	190	202	No	0.33	30	196	202	No	0.28
	35	192	202	No	0.44	35	198	202	No	0.42
	40	194	202	Yes	0.50	40	200	202	Yes	0.58
	45	196	202	Yes	0.62	45	202	202	Yes	0.65
	50	198	202	Yes	0.73	50	204	202	Yes	0.78
	55	200	202	Yes	0.77	55	205	202	Yes	0.84
	60	202	202	Yes	0.85	60	207	202	Yes	0.92
	65	204	202	Yes	0.91	65	209	202	Yes	0.96
	70	206	202	Yes	0.95	70	211	202	Yes	0.98
	75	209	202	Yes	0.97	75	214	202	Yes	>0.99
	80	211	202	Yes	0.99	80	216	202	Yes	>0.99
	85	214	202	Yes	0.99	85	219	202	Yes	>0.99
90	218	202	Yes	>0.99	90	223	202	Yes	>0.99	
95	224	202	Yes	>0.99	95	228	202	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level II	Prob.			Cut-Score	Level II	Prob.
5	5	181	207	No	0.01	5	186	207	No	<0.01
	10	186	207	No	0.04	10	191	207	No	0.01
	15	190	207	No	0.09	15	195	207	No	0.04
	20	193	207	No	0.19	20	197	207	No	0.09
	25	195	207	No	0.28	25	200	207	No	0.22
	30	198	207	No	0.38	30	202	207	No	0.28
	35	200	207	Yes	0.50	35	204	207	No	0.42
	40	202	207	Yes	0.62	40	206	207	Yes	0.58
	45	204	207	Yes	0.67	45	208	207	Yes	0.72
	50	206	207	Yes	0.77	50	210	207	Yes	0.83
	55	208	207	Yes	0.85	55	212	207	Yes	0.91
	60	210	207	Yes	0.91	60	214	207	Yes	0.96
	65	212	207	Yes	0.93	65	215	207	Yes	0.97
	70	214	207	Yes	0.96	70	218	207	Yes	0.99
	75	216	207	Yes	0.98	75	220	207	Yes	>0.99
	80	218	207	Yes	0.99	80	222	207	Yes	>0.99
	85	221	207	Yes	>0.99	85	225	207	Yes	>0.99
90	225	207	Yes	>0.99	90	229	207	Yes	>0.99	
95	231	207	Yes	>0.99	95	234	207	Yes	>0.99	
6	5	186	208	No	0.02	5	190	208	No	<0.01
	10	192	208	No	0.10	10	196	208	No	0.04
	15	196	208	No	0.23	15	199	208	No	0.09
	20	198	208	No	0.28	20	202	208	No	0.22
	25	201	208	No	0.44	25	204	208	No	0.35
	30	203	208	Yes	0.56	30	207	208	Yes	0.58
	35	205	208	Yes	0.67	35	209	208	Yes	0.72
	40	207	208	Yes	0.72	40	211	208	Yes	0.83
	45	209	208	Yes	0.81	45	212	208	Yes	0.88
	50	211	208	Yes	0.88	50	214	208	Yes	0.94
	55	213	208	Yes	0.93	55	216	208	Yes	0.96
	60	215	208	Yes	0.94	60	218	208	Yes	0.98
	65	217	208	Yes	0.97	65	220	208	Yes	0.99
	70	219	208	Yes	0.99	70	222	208	Yes	>0.99
	75	221	208	Yes	0.99	75	224	208	Yes	>0.99
	80	224	208	Yes	>0.99	80	226	208	Yes	>0.99
	85	226	208	Yes	>0.99	85	229	208	Yes	>0.99
90	230	208	Yes	>0.99	90	233	208	Yes	>0.99	
95	236	208	Yes	>0.99	95	238	208	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level II	Prob.			Cut-Score	Level II	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	211	No	0.04	5	194	211	No	<0.01
	10	197	211	No	0.16	10	199	211	No	0.03
	15	201	211	No	0.26	15	203	211	No	0.14
	20	204	211	No	0.40	20	206	211	No	0.29
	25	207	211	Yes	0.50	25	209	211	No	0.43
	30	209	211	Yes	0.60	30	211	211	Yes	0.57
	35	211	211	Yes	0.69	35	213	211	Yes	0.71
	40	213	211	Yes	0.74	40	215	211	Yes	0.82
	45	215	211	Yes	0.81	45	217	211	Yes	0.90
	50	217	211	Yes	0.87	50	219	211	Yes	0.95
	55	219	211	Yes	0.92	55	221	211	Yes	0.98
	60	221	211	Yes	0.94	60	223	211	Yes	0.99
	65	223	211	Yes	0.96	65	225	211	Yes	>0.99
	70	225	211	Yes	0.98	70	227	211	Yes	>0.99
	75	228	211	Yes	0.99	75	229	211	Yes	>0.99
	80	230	211	Yes	0.99	80	232	211	Yes	>0.99
	85	234	211	Yes	>0.99	85	235	211	Yes	>0.99
90	237	211	Yes	>0.99	90	239	211	Yes	>0.99	
95	243	211	Yes	>0.99	95	244	211	Yes	>0.99	

Note. %ile=percentile

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

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level II	Prob.			Cut Score	Level II	Prob.
3	5	169	199	No	0.01	5	176	199	No	<0.01
	10	174	199	No	0.04	10	181	199	No	0.01
	15	177	199	No	0.11	15	184	199	No	0.03
	20	179	199	No	0.17	20	187	199	No	0.07
	25	182	199	No	0.32	25	189	199	No	0.14
	30	184	199	No	0.38	30	191	199	No	0.26
	35	185	199	No	0.44	35	193	199	No	0.42
	40	187	199	Yes	0.56	40	195	199	Yes	0.58
	45	189	199	Yes	0.68	45	197	199	Yes	0.74
	50	190	199	Yes	0.73	50	198	199	Yes	0.80
	55	192	199	Yes	0.83	55	200	199	Yes	0.90
	60	194	199	Yes	0.89	60	202	199	Yes	0.95
	65	195	199	Yes	0.92	65	203	199	Yes	0.97
	70	197	199	Yes	0.96	70	205	199	Yes	0.99
	75	199	199	Yes	0.97	75	207	199	Yes	>0.99
	80	201	199	Yes	0.99	80	209	199	Yes	>0.99
	85	204	199	Yes	>0.99	85	212	199	Yes	>0.99
90	207	199	Yes	>0.99	90	215	199	Yes	>0.99	
95	212	199	Yes	>0.99	95	220	199	Yes	>0.99	
4	5	179	212	No	<0.01	5	185	212	No	<0.01
	10	184	212	No	0.01	10	190	212	No	<0.01
	15	188	212	No	0.03	15	194	212	No	<0.01
	20	190	212	No	0.06	20	197	212	No	0.02
	25	193	212	No	0.14	25	199	212	No	0.05
	30	195	212	No	0.22	30	201	212	No	0.10
	35	197	212	No	0.32	35	203	212	No	0.20
	40	198	212	No	0.38	40	205	212	No	0.34
	45	200	212	Yes	0.50	45	207	212	Yes	0.50
	50	202	212	Yes	0.62	50	209	212	Yes	0.66
	55	204	212	Yes	0.73	55	211	212	Yes	0.80
	60	205	212	Yes	0.73	60	212	212	Yes	0.86
	65	207	212	Yes	0.83	65	214	212	Yes	0.93
	70	209	212	Yes	0.89	70	216	212	Yes	0.97
	75	211	212	Yes	0.94	75	218	212	Yes	0.99
	80	214	212	Yes	0.98	80	221	212	Yes	>0.99
	85	216	212	Yes	0.99	85	223	212	Yes	>0.99
90	220	212	Yes	>0.99	90	227	212	Yes	>0.99	
95	225	212	Yes	>0.99	95	232	212	Yes	>0.99	



TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level II	Prob.			Cut-Score	Level II	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	218	No	<0.01	5	196	218	No	<0.01
	10	198	218	No	0.04	10	202	218	No	<0.01
	15	202	218	No	0.12	15	205	218	No	0.02
	20	205	218	No	0.23	20	209	218	No	0.11
	25	207	218	No	0.33	25	211	218	No	0.20
	30	209	218	No	0.44	30	214	218	No	0.42
	35	212	218	Yes	0.62	35	216	218	Yes	0.58
	40	214	218	Yes	0.72	40	218	218	Yes	0.73
	45	216	218	Yes	0.81	45	220	218	Yes	0.85
	50	218	218	Yes	0.88	50	222	218	Yes	0.93
	55	220	218	Yes	0.93	55	224	218	Yes	0.97
	60	222	218	Yes	0.96	60	226	218	Yes	0.99
	65	224	218	Yes	0.98	65	228	218	Yes	>0.99
	70	226	218	Yes	0.99	70	230	218	Yes	>0.99
	75	228	218	Yes	>0.99	75	233	218	Yes	>0.99
	80	231	218	Yes	>0.99	80	236	218	Yes	>0.99
	85	234	218	Yes	>0.99	85	239	218	Yes	>0.99
90	238	218	Yes	>0.99	90	243	218	Yes	>0.99	
95	243	218	Yes	>0.99	95	248	218	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level II	Prob.			Cut-Score	Level II	Prob.
7	5	195	222	No	<0.01	5	198	222	No	<0.01
	10	201	222	No	0.01	10	204	222	No	<0.01
	15	205	222	No	0.05	15	208	222	No	0.01
	20	209	222	No	0.14	20	212	222	No	0.05
	25	211	222	No	0.22	25	215	222	No	0.15
	30	214	222	No	0.38	30	217	222	No	0.26
	35	216	222	Yes	0.50	35	220	222	Yes	0.50
	40	218	222	Yes	0.62	40	222	222	Yes	0.66
	45	221	222	Yes	0.78	45	224	222	Yes	0.80
	50	223	222	Yes	0.86	50	226	222	Yes	0.90
	55	225	222	Yes	0.92	55	228	222	Yes	0.95
	60	227	222	Yes	0.95	60	230	222	Yes	0.98
	65	229	222	Yes	0.98	65	233	222	Yes	>0.99
	70	231	222	Yes	0.99	70	235	222	Yes	>0.99
	75	234	222	Yes	>0.99	75	238	222	Yes	>0.99
	80	237	222	Yes	>0.99	80	240	222	Yes	>0.99
	85	240	222	Yes	>0.99	85	244	222	Yes	>0.99
90	244	222	Yes	>0.99	90	248	222	Yes	>0.99	
95	250	222	Yes	>0.99	95	254	222	Yes	>0.99	
8	5	197	223	No	<0.01	5	199	223	No	<0.01
	10	203	223	No	0.02	10	206	223	No	<0.01
	15	208	223	No	0.10	15	210	223	No	0.01
	20	211	223	No	0.18	20	214	223	No	0.08
	25	214	223	No	0.30	25	217	223	No	0.21
	30	217	223	No	0.45	30	220	223	No	0.42
	35	219	223	Yes	0.55	35	222	223	Yes	0.58
	40	222	223	Yes	0.70	40	225	223	Yes	0.79
	45	224	223	Yes	0.78	45	227	223	Yes	0.88
	50	226	223	Yes	0.85	50	229	223	Yes	0.94
	55	229	223	Yes	0.92	55	231	223	Yes	0.98
	60	231	223	Yes	0.96	60	234	223	Yes	>0.99
	65	233	223	Yes	0.98	65	236	223	Yes	>0.99
	70	236	223	Yes	0.99	70	239	223	Yes	>0.99
	75	238	223	Yes	0.99	75	241	223	Yes	>0.99
	80	241	223	Yes	>0.99	80	245	223	Yes	>0.99
	85	245	223	Yes	>0.99	85	248	223	Yes	>0.99
90	249	223	Yes	>0.99	90	253	223	Yes	>0.99	
95	256	223	Yes	>0.99	95	259	223	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 STAAR performance level. By using matched score data from a sample of students from Texas, 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 STAAR 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 STAAR 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 147 schools in Texas, cautions should be exercised when generalizing the results to test takers who differ significantly from this sample. Finally, cautions should also be exercised if the concorded scores are used for a subpopulation. NWEA will continue to gather information about STAAR performance from other schools in Texas to enhance the quality and generalizability of the study.

## References

- Hanson, B. A., Harris, D. J., Pommerich, M., Sconing, J. A., & Yi, Q. (2001). *Suggestions for the evaluation and use of concordance results*. (ACT Research Report No. 2001-1). Iowa City, IA: ACT, Inc.
- Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking*. New York: Springer.
- Pommerich, M., Hanson, B., Harris, D., & Sconing, J. (2004). Issues in conducting linkage between distinct tests. *Applied Psychological Measurement, 28*(4), 247-273.
- Thum Y. M., & Hauser, C. H. (2015). *NWEA 2015 MAP Norms for Student and School Achievement Status and Growth*. NWEA Research Report. Portland, OR: NWEA.

## Appendix

### Data and Analysis

#### Data

Data used in this study were collected from 147 schools in Texas. The sample contained matched STAAR and MAP reading scores of 50,108 students in Grades 3 to 8 and matched STAAR and MAP math scores of 46,987 students in Grades 3 to 8 who completed both MAP and STAAR 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 STAAR reading scores range from 0.75 to 0.82, and the correlation coefficients between MAP and STAAR math scores range from 0.76 to 0.87. In general, all these correlations indicate a strong relationship between MAP and STAAR test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

Subject	Grade	N	<i>r</i>	STAAR				MAP			
				Mean	SD	Min	Max	Mean	SD	Min	Max
Reading	3	8,750	0.82	1464	148.26	1026	1911	204	15.16	143	248
	4	8,736	0.82	1548	150.91	1047	1995	212	15.14	134	259
	5	8,627	0.78	1595	145.94	1110	2025	218	14.10	140	270
	6	8,451	0.79	1623	139.78	1178	2074	218	16.50	143	261
	7	8,403	0.78	1664	133.51	1295	2140	221	17.45	140	264
	8	7,141	0.75	1696	133.39	1178	2156	223	17.26	143	283
Math	3	8,838	0.84	1486	154.28	1033	1921	210	13.36	145	283
	4	8,844	0.87	1569	153.21	1191	2065	222	15.47	138	290
	5	8,634	0.87	1639	151.22	1189	2091	230	16.45	155	298
	6	8,160	0.84	1647	145.49	1024	2189	229	16.00	146	278
	7	8,256	0.86	1678	140.65	1015	2229	234	18.19	145	312
	8	4,255	0.76	1633	97.65	1315	2103	228	15.88	164	293

## Equipercentile Linking Procedure

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

Suppose we need to establish the concordance between two tests.  $x$  is a score on Test  $X$  (e.g., STAAR). Its equipercentile 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 equipercentile equivalent of scores on STAAR on the scale of MAP,  $P(x)$  is the percentile rank of a given score on Test  $X$ .  $G^{-1}$  is the inverse of the percentile rank function for scores on Test  $Y$  which indicates the scores on Test  $Y$  corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the frequency distributions as well as equipercentile 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 II or higher) on STAAR tests.

To calculate consistency rate of classification, sample students were designated “Below STAAR cut” or “At or above STAAR cut” based on their actual STAAR 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 STAAR 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 STAAR 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 STAAR 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 STAAR 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 STAAR 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 STAAR TO MAP CONCORDANCE

		STAAR Score	
		Below STAAR cut	At or Above STAAR cut
MAP Score	Below MAP cut	True Negative	False Positive
	At or Above MAP cut	False Negative	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 STAAR based on that student’s MAP scores in prior seasons (e.g. fall and winter). The probability of a student achieving Level II (Proficient) on STAAR, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(\text{Achieving Level II in spring} | a \text{ RIT score of } x) = 1 - \Phi\left(\frac{x + g - c}{SD}\right) \quad (A2)$$

where,  $\Phi$  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 II on the STAAR tests, based on his/her spring score  $s$ , it can be calculated by Equation (A3):

$$Pr(\text{Achieving Level II in spring} | a \text{ RIT score of } s \text{ in spring}) = 1 - \Phi\left(\frac{s - c}{SE}\right) \quad (A3)$$

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

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