# Linking the Ohio State Assessments to NWEA MAP Tests

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NWEA
Northwest Evaluation Association
*Partnering to help all kids learn*

# 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 Ohio's state tests in English language arts (ELA) and math 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 Ohio's state test in ELA and math. 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 3 (i.e., "Proficient") or higher performance designation on the Ohio state 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

Ohio state assessments include a series of achievement tests aligned to Ohio's Learning Standards in ELA and math for grades 3-8. For each grade and subject, there are four cut scores that distinguish between performance levels into five levels with Level 1 as the lowest and Level 5 as the highest. The Level 3 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 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 are aligned to the Ohio state standards. Unlike Ohio state tests, MAP assessments are vertically scaled across grades, a feature that supports direct measurement of academic growth and change. MAP scores are reported on a **R**asch Un**it** (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 Ohio State Test Readiness Levels

Tables 1 to 4 report the Ohio state test scaled scores associated with each of the five performance levels, as well as the estimated score range on the MAP tests associated with each Ohio state test 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 Ohio students' most probable performance level on state tests, based on their observed MAP scores. For example, a 3$^{rd}$ grade student who obtained a MAP math score of 205 in the spring testing season is likely to be at the very high end of Level 3 (Proficient) on the Ohio state test taken during that same testing season (see Table 2). Similarly, a 6$^{th}$ grade student who obtained a MAP reading score of 230 in the fall testing season is likely to be at Level 5 (Advanced) on the Ohio state test taken in the spring of 6$^{th}$ grade (see Table 3).

## TABLE 1. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN OHIO STATE TEST ELA AND MAP READING (WHEN MAP IS TAKEN IN SPRING)

| Grade | OHIO STATE TEST | | | | |
|---|---|---|---|---|---|
| | Level 1 *Limited* | Level 2 *Basic* | Level 3 *Proficient* | Level 4 *Accelerated* | Level 5 *Advanced* |
| 3 | 545-671 | 672-699 | **700**-724 | 725-751 | 752-863 |
| 4 | 549-673 | 674-699 | **700**-724 | 725-752 | 753-846 |
| 5 | 552-668 | 669-699 | **700**-724 | 725-754 | 755-848 |
| 6 | 555-667 | 668-699 | **700**-724 | 725-750 | 751-851 |
| 7 | 568-669 | 670-699 | **700**-724 | 725-748 | 749-833 |
| 8 | 586-681 | 682-699 | **700**-724 | 725-743 | 744-805 |

| Grade | MAP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-191 | 1-31 | 192-200 | 32-54 | **201**-207 | 55-72 | 208-213 | 73-83 | 214-350 | 84-99 |
| 4 | 100-197 | 1-28 | 198-206 | 29-51 | **207**-213 | 52-69 | 214-220 | 70-83 | 221-350 | 84-99 |
| 5 | 100-201 | 1-24 | 202-212 | 25-51 | **213**-219 | 52-69 | 220-226 | 70-84 | 227-350 | 85-99 |
| 6 | 100-205 | 1-24 | 206-216 | 25-52 | **217**-223 | 53-70 | 224-229 | 71-82 | 230-350 | 83-99 |
| 7 | 100-209 | 1-28 | 210-220 | 29-56 | **221**-228 | 57-75 | 229-234 | 76-85 | 235-350 | 86-99 |
| 8 | 100-217 | 1-43 | 218-225 | 44-63 | **226**-235 | 64-83 | 236-240 | 84-90 | 241-350 | 91-99 |

*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 OHIO STATE TEST AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

| Grade | OHIO STATE TEST | | | | |
|---|---|---|---|---|---|
| | Level 1 *Limited* | Level 2 *Basic* | Level 3 *Proficient* | Level 4 *Accelerated* | Level 5 *Advanced* |
| 3 | 587-682 | 683-699 | **700**-724 | 725-752 | 753-818 |
| 4 | 605-685 | 686-699 | **700**-724 | 725-758 | 759-835 |
| 5 | 624-686 | 687-699 | **700**-724 | 725-748 | 749-804 |
| 6 | 616-681 | 682-699 | **700**-724 | 725-743 | 744-790 |
| 7 | 605-683 | 684-699 | **700**-724 | 725-754 | 755-806 |
| 8 | 633-689 | 690-699 | **700**-724 | 725-743 | 744-774 |

| Grade | MAP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-197 | 1-33 | 198-201 | 34-44 | **202**-206 | 45-58 | 207-212 | 59-74 | 213-350 | 75-99 |
| 4 | 100-205 | 1-29 | 206-209 | 30-39 | **210**-215 | 40-55 | 216-223 | 56-74 | 224-350 | 75-99 |
| 5 | 100-213 | 1-31 | 214-218 | 32-42 | **219**-227 | 43-64 | 228-235 | 65-80 | 236-350 | 81-99 |
| 6 | 100-218 | 1-34 | 219-223 | 35-45 | **224**-231 | 46-64 | 232-237 | 65-76 | 238-350 | 77-99 |
| 7 | 100-225 | 1-43 | 226-231 | 44-56 | **232**-240 | 57-74 | 241-249 | 75-88 | 250-350 | 89-99 |
| 8 | 100-229 | 1-47 | 230-234 | 48-57 | **235**-246 | 58-79 | 247-255 | 80-90* | 256-350 | 90*-99 |

*Notes.* 1. %ile=percentile.
2. Bolded numbers indicate the cut scores considered to be at least "proficient" for accountability purposes.
3. * reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

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

| Grade | OHIO STATE TEST | | | | |
|---|---|---|---|---|---|
| | Level 1 *Limited* | Level 2 *Basic* | Level 3 *Proficient* | Level 4 *Accelerated* | Level 5 *Advanced* |
| 3 | 545-671 | 672-699 | **700**-724 | 725-751 | 752-863 |
| 4 | 549-673 | 674-699 | **700**-724 | 725-752 | 753-846 |
| 5 | 552-668 | 669-699 | **700**-724 | 725-754 | 755-848 |
| 6 | 555-667 | 668-699 | **700**-724 | 725-750 | 751-851 |
| 7 | 568-669 | 670-699 | **700**-724 | 725-748 | 749-833 |
| 8 | 586-681 | 682-699 | **700**-724 | 725-743 | 744-805 |

| Grade | MAP FALL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-179 | 1-28 | 180-190 | 29-55 | **191**-198 | 56-74 | 199-206 | 75-87 | 207-350 | 88-99 |
| 4 | 100-188 | 1-26 | 189-198 | 27-50 | **199**-206 | 51-70 | 207-215 | 71-86 | 216-350 | 87-99 |
| 5 | 100-193 | 1-21 | 194-206 | 22-52 | **207**-214 | 53-72 | 215-222 | 73-86 | 223-350 | 87-99 |
| 6 | 100-199 | 1-22 | 200-211 | 23-51 | **212**-219 | 52-71 | 220-226 | 72-85 | 227-350 | 86-99 |
| 7 | 100-204 | 1-25 | 205-217 | 26-57 | **218**-226 | 58-78 | 227-232 | 79-88 | 233-350 | 89-99 |
| 8 | 100-214 | 1-43 | 215-223 | 44-65 | **224**-233 | 66-84 | 234-238 | 85-91 | 239-350 | 92-99 |

| Grade | MAP WINTER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-187 | 1-29 | 188-197 | 30-54 | **198**-205 | 55-74 | 206-211 | 75-85 | 212-350 | 86-99 |
| 4 | 100-194 | 1-27 | 195-204 | 28-52 | **205**-211 | 53-70 | 212-219 | 71-85 | 220-350 | 86-99 |
| 5 | 100-198 | 1-21 | 199-210 | 22-51 | **211**-218 | 52-72 | 219-225 | 73-85 | 226-350 | 86-99 |
| 6 | 100-203 | 1-23 | 204-215 | 24-53 | **216**-222 | 54-71 | 223-228 | 72-83 | 229-350 | 84-99 |
| 7 | 100-207 | 1-26 | 208-219 | 27-56 | **220**-227 | 57-76 | 228-233 | 77-86 | 234-350 | 87-99 |
| 8 | 100-216 | 1-43 | 217-224 | 44-63 | **225**-234 | 64-84 | 235-239 | 85-90 | 240-350 | 91-99 |

*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 OHIO STATE TEST AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING OHIO STATE TESTS)

| Grade | OHIO STATE TEST | | | | |
|---|---|---|---|---|---|
| | Level 1 *Limited* | Level 2 *Basic* | Level 3 *Proficient* | Level 4 *Accelerated* | Level 5 *Advanced* |
| 3 | 587-682 | 683-699 | **700**-724 | 725-752 | 753-818 |
| 4 | 605-685 | 686-699 | **700**-724 | 725-758 | 759-835 |
| 5 | 624-686 | 687-699 | **700**-724 | 725-748 | 749-804 |
| 6 | 616-681 | 682-699 | **700**-724 | 725-743 | 744-790 |
| 7 | 605-683 | 684-699 | **700**-724 | 725-754 | 755-806 |
| 8 | 633-689 | 690-699 | **700**-724 | 725-743 | 744-774 |

| Grade | MAP FALL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-184 | 1-32 | 185-188 | 33-44 | **189**-193 | 45-59 | 194-200 | 60-77 | 201-350 | 78-99 |
| 4 | 100-193 | 1-26 | 194-197 | 27-37 | **198**-203 | 38-54 | 204-212 | 55-77 | 213-350 | 78-99 |
| 5 | 100-203 | 1-29 | 204-208 | 30-42 | **209**-217 | 43-66 | 218-225 | 67-83 | 226-350 | 84-99 |
| 6 | 100-210 | 1-32 | 211-215 | 33-44 | **216**-223 | 45-64 | 224-229 | 65-77 | 230-350 | 78-99 |
| 7 | 100-219 | 1-42 | 220-225 | 43-56 | **226**-234 | 57-76 | 235-243 | 77-89 | 244-350 | 90-99 |
| 8 | 100-224 | 1-45 | 225-229 | 46-57 | **230**-242 | 58-81 | 243-251 | 82-92 | 252-350 | 92-99 |

| Grade | MAP WINTER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 1 *Limited* | | Level 2 *Basic* | | Level 3 *Proficient* | | Level 4 *Accelerated* | | Level 5 *Advanced* | |
| | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile | RIT | %ile |
| 3 | 100-192 | 1-33 | 193-196 | 34-44 | **197**-201 | 45-59 | 202-207 | 60-75 | 208-350 | 76-99 |
| 4 | 100-200 | 1-28 | 201-204 | 29-38 | **205**-210 | 39-54 | 211-218 | 55-75 | 219-350 | 76-99 |
| 5 | 100-209 | 1-30 | 210-214 | 31-42 | **215**-223 | 43-65 | 224-231 | 66-82 | 232-350 | 83-99 |
| 6 | 100-215 | 1-34 | 216-220 | 35-46 | **221**-228 | 47-65 | 229-234 | 66-78 | 235-350 | 79-99 |
| 7 | 100-223 | 1-43 | 224-229 | 44-57 | **230**-238 | 58-76 | 239-247 | 77-89 | 248-350 | 90-99 |
| 8 | 100-227 | 1-46 | 228-232 | 47-57 | **233**-244 | 58-79 | 245-253 | 80-90 | 254-350 | 91-99 |

*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, & Sconing, 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 on the Ohio state 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 Ohio state test and MAP scores. The results in Table 5 demonstrate that on average, MAP reading scores can consistently classify students' proficiency (Level 3 or higher) status on Ohio state ELA test approximately 82% of the time and MAP math scores can consistently classify students on Ohio state math test approximately 83% 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 Ohio state tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND OHIO STATE TEST LEVEL 3 EQUIPERCENTILE CONCORDANCES

| Grade | ELA/Reading | | | Math | | |
|---|---|---|---|---|---|---|
| | Consistency Rate | False Positives | False Negatives | Consistency Rate | False Positives | False Negatives |
| 3 | 0.79 | 0.11 | 0.10 | 0.83 | 0.08 | 0.09 |
| 4 | 0.81 | 0.10 | 0.09 | 0.82 | 0.09 | 0.09 |
| 5 | 0.82 | 0.10 | 0.08 | 0.82 | 0.09 | 0.09 |
| 6 | 0.83 | 0.11 | 0.06 | 0.85 | 0.08 | 0.07 |
| 7 | 0.84 | 0.09 | 0.07 | 0.87 | 0.06 | 0.07 |
| 8 | 0.83 | 0.09 | 0.08 | 0.80 | 0.10 | 0.10 |

# Proficiency Projection

Proficiency projection tells how likely a student is classified as "proficient" on Ohio state 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 Ohio state tests are presented in Tables 6 to 8. These tables estimate the probability of scoring at Level 3 or above on Ohio state test in the spring and the prior fall or winter testing season. For example, if a 3rd grade student obtained a MAP math score of 194 in the fall, the probability of obtaining a Level 3 or higher Ohio state test score in the spring of 3rd grade is 78%. Table 6 presents the estimated probability of meeting Level 3 benchmark when MAP is taken in the spring, whereas Tables 7 and 8 present the estimated probability of meeting Level 3 benchmark when MAP is taken in the fall or winter prior to taking the Ohio state tests.

## TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING OHIO STATE TEST LEVEL 3 (PROFICIENT) WHEN MAP IS TAKEN IN THE SPRING

| Grade | ELA/Reading | | | | | Math | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Start %ile | RIT Spring | Projected Proficiency | | | Start %ile | RIT Spring | Projected Proficiency | | |
| | | | Cut Score | Level 3 | Prob. | | | Cut Score | Level 3 | Prob. |
| 3 | 5 | 174 | 201 | No | <0.01 | 5 | 181 | 202 | No | <0.01 |
| | 10 | 179 | 201 | No | <0.01 | 10 | 186 | 202 | No | <0.01 |
| | 15 | 183 | 201 | No | <0.01 | 15 | 189 | 202 | No | <0.01 |
| | 20 | 186 | 201 | No | <0.01 | 20 | 192 | 202 | No | <0.01 |
| | 25 | 188 | 201 | No | <0.01 | 25 | 194 | 202 | No | <0.01 |
| | 30 | 191 | 201 | No | <0.01 | 30 | 196 | 202 | No | 0.02 |
| | 35 | 193 | 201 | No | 0.01 | 35 | 198 | 202 | No | 0.08 |
| | 40 | 195 | 201 | No | 0.03 | 40 | 200 | 202 | No | 0.25 |
| | 45 | 197 | 201 | No | 0.11 | 45 | 202 | 202 | Yes | 0.50 |
| | 50 | 199 | 201 | No | 0.27 | 50 | 203 | 202 | Yes | 0.63 |
| | 55 | 201 | 201 | Yes | 0.50 | 55 | 205 | 202 | Yes | 0.85 |
| | 60 | 202 | 201 | Yes | 0.62 | 60 | 207 | 202 | Yes | 0.96 |
| | 65 | 204 | 201 | Yes | 0.83 | 65 | 209 | 202 | Yes | 0.99 |
| | 70 | 207 | 201 | Yes | 0.97 | 70 | 211 | 202 | Yes | >0.99 |
| | 75 | 209 | 201 | Yes | 0.99 | 75 | 213 | 202 | Yes | >0.99 |
| | 80 | 211 | 201 | Yes | >0.99 | 80 | 215 | 202 | Yes | >0.99 |
| | 85 | 214 | 201 | Yes | >0.99 | 85 | 218 | 202 | Yes | >0.99 |
| | 90 | 218 | 201 | Yes | >0.99 | 90 | 221 | 202 | Yes | >0.99 |
| | 95 | 223 | 201 | Yes | >0.99 | 95 | 226 | 202 | Yes | >0.99 |
| 4 | 5 | 181 | 207 | No | <0.01 | 5 | 189 | 210 | No | <0.01 |
| | 10 | 187 | 207 | No | <0.01 | 10 | 194 | 210 | No | <0.01 |
| | 15 | 190 | 207 | No | <0.01 | 15 | 198 | 210 | No | <0.01 |
| | 20 | 193 | 207 | No | <0.01 | 20 | 201 | 210 | No | <0.01 |
| | 25 | 196 | 207 | No | <0.01 | 25 | 203 | 210 | No | 0.01 |
| | 30 | 198 | 207 | No | <0.01 | 30 | 206 | 210 | No | 0.08 |
| | 35 | 200 | 207 | No | 0.01 | 35 | 208 | 210 | No | 0.25 |
| | 40 | 202 | 207 | No | 0.06 | 40 | 210 | 210 | Yes | 0.50 |
| | 45 | 204 | 207 | No | 0.17 | 45 | 212 | 210 | Yes | 0.75 |
| | 50 | 206 | 207 | No | 0.38 | 50 | 213 | 210 | Yes | 0.85 |
| | 55 | 208 | 207 | Yes | 0.62 | 55 | 215 | 210 | Yes | 0.96 |
| | 60 | 210 | 207 | Yes | 0.83 | 60 | 217 | 210 | Yes | 0.99 |
| | 65 | 212 | 207 | Yes | 0.94 | 65 | 219 | 210 | Yes | >0.99 |
| | 70 | 214 | 207 | Yes | 0.99 | 70 | 221 | 210 | Yes | >0.99 |
| | 75 | 216 | 207 | Yes | >0.99 | 75 | 224 | 210 | Yes | >0.99 |
| | 80 | 218 | 207 | Yes | >0.99 | 80 | 226 | 210 | Yes | >0.99 |
| | 85 | 221 | 207 | Yes | >0.99 | 85 | 229 | 210 | Yes | >0.99 |
| | 90 | 225 | 207 | Yes | >0.99 | 90 | 233 | 210 | Yes | >0.99 |
| | 95 | 230 | 207 | Yes | >0.99 | 95 | 238 | 210 | Yes | >0.99 |

TABLE 6. (CONTINUED)

| Grade | ELA/Reading | | | | | Math | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Start %ile | RIT Spring | Projected Proficiency | | | Start %ile | RIT Spring | Projected Proficiency | | |
| | | | Cut Score | Level 3 | Prob. | | | Cut Score | Level 3 | Prob. |
| 5 | 5 | 188 | 213 | No | <0.01 | 5 | 195 | 219 | No | <0.01 |
| | 10 | 193 | 213 | No | <0.01 | 10 | 201 | 219 | No | <0.01 |
| | 15 | 197 | 213 | No | <0.01 | 15 | 205 | 219 | No | <0.01 |
| | 20 | 199 | 213 | No | <0.01 | 20 | 208 | 219 | No | <0.01 |
| | 25 | 202 | 213 | No | <0.01 | 25 | 210 | 219 | No | <0.01 |
| | 30 | 204 | 213 | No | <0.01 | 30 | 213 | 219 | No | 0.02 |
| | 35 | 206 | 213 | No | 0.01 | 35 | 215 | 219 | No | 0.08 |
| | 40 | 208 | 213 | No | 0.06 | 40 | 217 | 219 | No | 0.25 |
| | 45 | 210 | 213 | No | 0.17 | 45 | 219 | 219 | Yes | 0.50 |
| | 50 | 212 | 213 | No | 0.38 | 50 | 221 | 219 | Yes | 0.75 |
| | 55 | 214 | 213 | Yes | 0.62 | 55 | 223 | 219 | Yes | 0.92 |
| | 60 | 216 | 213 | Yes | 0.83 | 60 | 225 | 219 | Yes | 0.98 |
| | 65 | 217 | 213 | Yes | 0.89 | 65 | 228 | 219 | Yes | >0.99 |
| | 70 | 220 | 213 | Yes | 0.99 | 70 | 230 | 219 | Yes | >0.99 |
| | 75 | 222 | 213 | Yes | >0.99 | 75 | 232 | 219 | Yes | >0.99 |
| | 80 | 224 | 213 | Yes | >0.99 | 80 | 235 | 219 | Yes | >0.99 |
| | 85 | 227 | 213 | Yes | >0.99 | 85 | 238 | 219 | Yes | >0.99 |
| | 90 | 231 | 213 | Yes | >0.99 | 90 | 242 | 219 | Yes | >0.99 |
| | 95 | 236 | 213 | Yes | >0.99 | 95 | 248 | 219 | Yes | >0.99 |
| 6 | 5 | 192 | 217 | No | <0.01 | 5 | 198 | 224 | No | <0.01 |
| | 10 | 197 | 217 | No | <0.01 | 10 | 204 | 224 | No | <0.01 |
| | 15 | 201 | 217 | No | <0.01 | 15 | 208 | 224 | No | <0.01 |
| | 20 | 203 | 217 | No | <0.01 | 20 | 211 | 224 | No | <0.01 |
| | 25 | 206 | 217 | No | <0.01 | 25 | 214 | 224 | No | <0.01 |
| | 30 | 208 | 217 | No | <0.01 | 30 | 217 | 224 | No | 0.01 |
| | 35 | 210 | 217 | No | 0.01 | 35 | 219 | 224 | No | 0.04 |
| | 40 | 212 | 217 | No | 0.06 | 40 | 221 | 224 | No | 0.15 |
| | 45 | 214 | 217 | No | 0.17 | 45 | 223 | 224 | No | 0.37 |
| | 50 | 216 | 217 | No | 0.38 | 50 | 225 | 224 | Yes | 0.63 |
| | 55 | 218 | 217 | Yes | 0.62 | 55 | 227 | 224 | Yes | 0.85 |
| | 60 | 219 | 217 | Yes | 0.73 | 60 | 230 | 224 | Yes | 0.98 |
| | 65 | 221 | 217 | Yes | 0.89 | 65 | 232 | 224 | Yes | >0.99 |
| | 70 | 223 | 217 | Yes | 0.97 | 70 | 234 | 224 | Yes | >0.99 |
| | 75 | 226 | 217 | Yes | >0.99 | 75 | 237 | 224 | Yes | >0.99 |
| | 80 | 228 | 217 | Yes | >0.99 | 80 | 239 | 224 | Yes | >0.99 |
| | 85 | 231 | 217 | Yes | >0.99 | 85 | 243 | 224 | Yes | >0.99 |
| | 90 | 235 | 217 | Yes | >0.99 | 90 | 247 | 224 | Yes | >0.99 |
| | 95 | 240 | 217 | Yes | >0.99 | 95 | 253 | 224 | Yes | >0.99 |

TABLE 6. (CONTINUED)

| Grade | ELA/Reading | | | | | Math | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Start %ile | RIT Spring | Projected Proficiency | | | Start %ile | RIT Spring | Projected Proficiency | | |
| | | | Cut Score | Level 3 | Prob. | | | Cut Score | Level 3 | Prob. |
| 7 | 5 | 193 | 221 | No | <0.01 | 5 | 199 | 232 | No | <0.01 |
| | 10 | 199 | 221 | No | <0.01 | 10 | 206 | 232 | No | <0.01 |
| | 15 | 202 | 221 | No | <0.01 | 15 | 210 | 232 | No | <0.01 |
| | 20 | 205 | 221 | No | <0.01 | 20 | 214 | 232 | No | <0.01 |
| | 25 | 208 | 221 | No | <0.01 | 25 | 217 | 232 | No | <0.01 |
| | 30 | 210 | 221 | No | <0.01 | 30 | 219 | 232 | No | <0.01 |
| | 35 | 212 | 221 | No | <0.01 | 35 | 222 | 232 | No | <0.01 |
| | 40 | 214 | 221 | No | 0.01 | 40 | 224 | 232 | No | <0.01 |
| | 45 | 216 | 221 | No | 0.06 | 45 | 226 | 232 | No | 0.02 |
| | 50 | 218 | 221 | No | 0.17 | 50 | 229 | 232 | No | 0.15 |
| | 55 | 220 | 221 | No | 0.38 | 55 | 231 | 232 | No | 0.37 |
| | 60 | 222 | 221 | Yes | 0.62 | 60 | 233 | 232 | Yes | 0.63 |
| | 65 | 224 | 221 | Yes | 0.83 | 65 | 235 | 232 | Yes | 0.85 |
| | 70 | 226 | 221 | Yes | 0.94 | 70 | 238 | 232 | Yes | 0.98 |
| | 75 | 228 | 221 | Yes | 0.99 | 75 | 241 | 232 | Yes | >0.99 |
| | 80 | 231 | 221 | Yes | >0.99 | 80 | 244 | 232 | Yes | >0.99 |
| | 85 | 234 | 221 | Yes | >0.99 | 85 | 247 | 232 | Yes | >0.99 |
| | 90 | 238 | 221 | Yes | >0.99 | 90 | 251 | 232 | Yes | >0.99 |
| | 95 | 243 | 221 | Yes | >0.99 | 95 | 258 | 232 | Yes | >0.99 |
| 8 | 5 | 194 | 226 | No | <0.01 | 5 | 199 | 235 | No | <0.01 |
| | 10 | 200 | 226 | No | <0.01 | 10 | 206 | 235 | No | <0.01 |
| | 15 | 204 | 226 | No | <0.01 | 15 | 211 | 235 | No | <0.01 |
| | 20 | 207 | 226 | No | <0.01 | 20 | 215 | 235 | No | <0.01 |
| | 25 | 209 | 226 | No | <0.01 | 25 | 218 | 235 | No | <0.01 |
| | 30 | 212 | 226 | No | <0.01 | 30 | 221 | 235 | No | <0.01 |
| | 35 | 214 | 226 | No | <0.01 | 35 | 224 | 235 | No | <0.01 |
| | 40 | 216 | 226 | No | <0.01 | 40 | 226 | 235 | No | <0.01 |
| | 45 | 218 | 226 | No | 0.01 | 45 | 229 | 235 | No | 0.02 |
| | 50 | 220 | 226 | No | 0.03 | 50 | 231 | 235 | No | 0.08 |
| | 55 | 222 | 226 | No | 0.11 | 55 | 233 | 235 | No | 0.25 |
| | 60 | 224 | 226 | No | 0.27 | 60 | 236 | 235 | Yes | 0.63 |
| | 65 | 226 | 226 | Yes | 0.50 | 65 | 238 | 235 | Yes | 0.85 |
| | 70 | 228 | 226 | Yes | 0.73 | 70 | 241 | 235 | Yes | 0.98 |
| | 75 | 231 | 226 | Yes | 0.94 | 75 | 244 | 235 | Yes | >0.99 |
| | 80 | 233 | 226 | Yes | 0.99 | 80 | 247 | 235 | Yes | >0.99 |
| | 85 | 236 | 226 | Yes | >0.99 | 85 | 251 | 235 | Yes | >0.99 |
| | 90 | 240 | 226 | Yes | >0.99 | 90 | 255 | 235 | Yes | >0.99 |
| | 95 | 246 | 226 | Yes | >0.99 | 95 | 262 | 235 | Yes | >0.99 |

*Note.* %ile=percentile

## TABLE 7. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING OHIO STATE TEST ELA LEVEL 3 (PROFICIENT) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING OHIO STATE TEST

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut Score | Level 3 | Prob. | | | Cut Score | Level 3 | Prob. |
| 3 | 5 | 162 | 201 | No | <0.01 | 5 | 171 | 201 | No | <0.01 |
| | 10 | 168 | 201 | No | <0.01 | 10 | 176 | 201 | No | <0.01 |
| | 15 | 172 | 201 | No | 0.01 | 15 | 180 | 201 | No | <0.01 |
| | 20 | 175 | 201 | No | 0.03 | 20 | 183 | 201 | No | <0.01 |
| | 25 | 178 | 201 | No | 0.06 | 25 | 185 | 201 | No | 0.01 |
| | 30 | 180 | 201 | No | 0.10 | 30 | 188 | 201 | No | 0.04 |
| | 35 | 182 | 201 | No | 0.13 | 35 | 190 | 201 | No | 0.06 |
| | 40 | 184 | 201 | No | 0.20 | 40 | 192 | 201 | No | 0.13 |
| | 45 | 186 | 201 | No | 0.29 | 45 | 194 | 201 | No | 0.22 |
| | 50 | 188 | 201 | No | 0.34 | 50 | 196 | 201 | No | 0.35 |
| | 55 | 190 | 201 | No | 0.44 | 55 | 198 | 201 | Yes | 0.50 |
| | 60 | 192 | 201 | Yes | 0.56 | 60 | 199 | 201 | Yes | 0.58 |
| | 65 | 194 | 201 | Yes | 0.61 | 65 | 201 | 201 | Yes | 0.72 |
| | 70 | 197 | 201 | Yes | 0.76 | 70 | 204 | 201 | Yes | 0.87 |
| | 75 | 199 | 201 | Yes | 0.84 | 75 | 206 | 201 | Yes | 0.91 |
| | 80 | 202 | 201 | Yes | 0.90 | 80 | 208 | 201 | Yes | 0.96 |
| | 85 | 205 | 201 | Yes | 0.95 | 85 | 211 | 201 | Yes | 0.99 |
| | 90 | 209 | 201 | Yes | 0.98 | 90 | 215 | 201 | Yes | >0.99 |
| | 95 | 214 | 201 | Yes | >0.99 | 95 | 221 | 201 | Yes | >0.99 |
| 4 | 5 | 173 | 207 | No | <0.01 | 5 | 179 | 207 | No | <0.01 |
| | 10 | 178 | 207 | No | <0.01 | 10 | 184 | 207 | No | <0.01 |
| | 15 | 182 | 207 | No | 0.01 | 15 | 188 | 207 | No | <0.01 |
| | 20 | 185 | 207 | No | 0.04 | 20 | 191 | 207 | No | 0.01 |
| | 25 | 188 | 207 | No | 0.07 | 25 | 194 | 207 | No | 0.02 |
| | 30 | 190 | 207 | No | 0.12 | 30 | 196 | 207 | No | 0.06 |
| | 35 | 192 | 207 | No | 0.18 | 35 | 198 | 207 | No | 0.12 |
| | 40 | 194 | 207 | No | 0.23 | 40 | 200 | 207 | No | 0.22 |
| | 45 | 196 | 207 | No | 0.33 | 45 | 202 | 207 | No | 0.28 |
| | 50 | 198 | 207 | No | 0.44 | 50 | 204 | 207 | No | 0.42 |
| | 55 | 200 | 207 | Yes | 0.50 | 55 | 205 | 207 | Yes | 0.50 |
| | 60 | 202 | 207 | Yes | 0.62 | 60 | 207 | 207 | Yes | 0.65 |
| | 65 | 204 | 207 | Yes | 0.73 | 65 | 209 | 207 | Yes | 0.78 |
| | 70 | 206 | 207 | Yes | 0.82 | 70 | 211 | 207 | Yes | 0.88 |
| | 75 | 209 | 207 | Yes | 0.88 | 75 | 214 | 207 | Yes | 0.96 |
| | 80 | 211 | 207 | Yes | 0.93 | 80 | 216 | 207 | Yes | 0.98 |
| | 85 | 214 | 207 | Yes | 0.96 | 85 | 219 | 207 | Yes | 0.99 |
| | 90 | 218 | 207 | Yes | 0.99 | 90 | 223 | 207 | Yes | >0.99 |
| | 95 | 224 | 207 | Yes | >0.99 | 95 | 228 | 207 | Yes | >0.99 |

TABLE 7. (CONTINUED)

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut-Score | Level 3 | Prob. | | | Cut-Score | Level 3 | Prob. |
| 5 | 5 | 181 | 213 | No | <0.01 | 5 | 186 | 213 | No | <0.01 |
| | 10 | 186 | 213 | No | <0.01 | 10 | 191 | 213 | No | <0.01 |
| | 15 | 190 | 213 | No | 0.01 | 15 | 195 | 213 | No | <0.01 |
| | 20 | 193 | 213 | No | 0.04 | 20 | 197 | 213 | No | 0.01 |
| | 25 | 195 | 213 | No | 0.07 | 25 | 200 | 213 | No | 0.03 |
| | 30 | 198 | 213 | No | 0.12 | 30 | 202 | 213 | No | 0.04 |
| | 35 | 200 | 213 | No | 0.19 | 35 | 204 | 213 | No | 0.09 |
| | 40 | 202 | 213 | No | 0.28 | 40 | 206 | 213 | No | 0.17 |
| | 45 | 204 | 213 | No | 0.33 | 45 | 208 | 213 | No | 0.28 |
| | 50 | 206 | 213 | No | 0.44 | 50 | 210 | 213 | No | 0.42 |
| | 55 | 208 | 213 | Yes | 0.56 | 55 | 212 | 213 | Yes | 0.58 |
| | 60 | 210 | 213 | Yes | 0.67 | 60 | 214 | 213 | Yes | 0.72 |
| | 65 | 212 | 213 | Yes | 0.72 | 65 | 215 | 213 | Yes | 0.78 |
| | 70 | 214 | 213 | Yes | 0.81 | 70 | 218 | 213 | Yes | 0.91 |
| | 75 | 216 | 213 | Yes | 0.88 | 75 | 220 | 213 | Yes | 0.94 |
| | 80 | 218 | 213 | Yes | 0.91 | 80 | 222 | 213 | Yes | 0.97 |
| | 85 | 221 | 213 | Yes | 0.96 | 85 | 225 | 213 | Yes | 0.99 |
| | 90 | 225 | 213 | Yes | 0.99 | 90 | 229 | 213 | Yes | >0.99 |
| | 95 | 231 | 213 | Yes | >0.99 | 95 | 234 | 213 | Yes | >0.99 |
| 6 | 5 | 186 | 217 | No | <0.01 | 5 | 190 | 217 | No | <0.01 |
| | 10 | 192 | 217 | No | <0.01 | 10 | 196 | 217 | No | <0.01 |
| | 15 | 196 | 217 | No | 0.02 | 15 | 199 | 217 | No | <0.01 |
| | 20 | 198 | 217 | No | 0.03 | 20 | 202 | 217 | No | 0.01 |
| | 25 | 201 | 217 | No | 0.07 | 25 | 204 | 217 | No | 0.02 |
| | 30 | 203 | 217 | No | 0.12 | 30 | 207 | 217 | No | 0.06 |
| | 35 | 205 | 217 | No | 0.19 | 35 | 209 | 217 | No | 0.12 |
| | 40 | 207 | 217 | No | 0.23 | 40 | 211 | 217 | No | 0.22 |
| | 45 | 209 | 217 | No | 0.33 | 45 | 212 | 217 | No | 0.28 |
| | 50 | 211 | 217 | No | 0.44 | 50 | 214 | 217 | No | 0.42 |
| | 55 | 213 | 217 | Yes | 0.56 | 55 | 216 | 217 | Yes | 0.50 |
| | 60 | 215 | 217 | Yes | 0.61 | 60 | 218 | 217 | Yes | 0.65 |
| | 65 | 217 | 217 | Yes | 0.72 | 65 | 220 | 217 | Yes | 0.78 |
| | 70 | 219 | 217 | Yes | 0.81 | 70 | 222 | 217 | Yes | 0.88 |
| | 75 | 221 | 217 | Yes | 0.84 | 75 | 224 | 217 | Yes | 0.94 |
| | 80 | 224 | 217 | Yes | 0.93 | 80 | 226 | 217 | Yes | 0.97 |
| | 85 | 226 | 217 | Yes | 0.96 | 85 | 229 | 217 | Yes | 0.99 |
| | 90 | 230 | 217 | Yes | 0.99 | 90 | 233 | 217 | Yes | >0.99 |
| | 95 | 236 | 217 | Yes | >0.99 | 95 | 238 | 217 | Yes | >0.99 |

TABLE 7. (CONTINUED)

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut-Score | Level 3 | Prob. | | | Cut-Score | Level 3 | Prob. |
| 7 | 5 | 189 | 221 | No | <0.01 | 5 | 192 | 221 | No | <0.01 |
| | 10 | 195 | 221 | No | <0.01 | 10 | 198 | 221 | No | <0.01 |
| | 15 | 199 | 221 | No | 0.01 | 15 | 201 | 221 | No | <0.01 |
| | 20 | 202 | 221 | No | 0.02 | 20 | 204 | 221 | No | <0.01 |
| | 25 | 204 | 221 | No | 0.04 | 25 | 207 | 221 | No | 0.01 |
| | 30 | 206 | 221 | No | 0.07 | 30 | 209 | 221 | No | 0.03 |
| | 35 | 209 | 221 | No | 0.12 | 35 | 211 | 221 | No | 0.06 |
| | 40 | 211 | 221 | No | 0.19 | 40 | 213 | 221 | No | 0.09 |
| | 45 | 213 | 221 | No | 0.28 | 45 | 215 | 221 | No | 0.17 |
| | 50 | 214 | 221 | No | 0.33 | 50 | 217 | 221 | No | 0.28 |
| | 55 | 216 | 221 | No | 0.39 | 55 | 219 | 221 | No | 0.42 |
| | 60 | 218 | 221 | Yes | 0.50 | 60 | 221 | 221 | Yes | 0.58 |
| | 65 | 220 | 221 | Yes | 0.61 | 65 | 223 | 221 | Yes | 0.72 |
| | 70 | 222 | 221 | Yes | 0.72 | 70 | 225 | 221 | Yes | 0.83 |
| | 75 | 225 | 221 | Yes | 0.81 | 75 | 227 | 221 | Yes | 0.91 |
| | 80 | 227 | 221 | Yes | 0.88 | 80 | 230 | 221 | Yes | 0.97 |
| | 85 | 230 | 221 | Yes | 0.95 | 85 | 232 | 221 | Yes | 0.98 |
| | 90 | 234 | 221 | Yes | 0.98 | 90 | 236 | 221 | Yes | >0.99 |
| | 95 | 240 | 221 | Yes | >0.99 | 95 | 242 | 221 | Yes | >0.99 |
| 8 | 5 | 191 | 226 | No | <0.01 | 5 | 194 | 226 | No | <0.01 |
| | 10 | 197 | 226 | No | <0.01 | 10 | 199 | 226 | No | <0.01 |
| | 15 | 201 | 226 | No | 0.01 | 15 | 203 | 226 | No | <0.01 |
| | 20 | 204 | 226 | No | 0.02 | 20 | 206 | 226 | No | <0.01 |
| | 25 | 207 | 226 | No | 0.03 | 25 | 209 | 226 | No | <0.01 |
| | 30 | 209 | 226 | No | 0.05 | 30 | 211 | 226 | No | 0.01 |
| | 35 | 211 | 226 | No | 0.08 | 35 | 213 | 226 | No | 0.01 |
| | 40 | 213 | 226 | No | 0.10 | 40 | 215 | 226 | No | 0.03 |
| | 45 | 215 | 226 | No | 0.16 | 45 | 217 | 226 | No | 0.07 |
| | 50 | 217 | 226 | No | 0.22 | 50 | 219 | 226 | No | 0.14 |
| | 55 | 219 | 226 | No | 0.31 | 55 | 221 | 226 | No | 0.23 |
| | 60 | 221 | 226 | No | 0.35 | 60 | 223 | 226 | No | 0.36 |
| | 65 | 223 | 226 | No | 0.45 | 65 | 225 | 226 | Yes | 0.50 |
| | 70 | 225 | 226 | Yes | 0.55 | 70 | 227 | 226 | Yes | 0.64 |
| | 75 | 228 | 226 | Yes | 0.65 | 75 | 229 | 226 | Yes | 0.77 |
| | 80 | 230 | 226 | Yes | 0.74 | 80 | 232 | 226 | Yes | 0.86 |
| | 85 | 234 | 226 | Yes | 0.87 | 85 | 235 | 226 | Yes | 0.95 |
| | 90 | 237 | 226 | Yes | 0.92 | 90 | 239 | 226 | Yes | 0.99 |
| | 95 | 243 | 226 | Yes | 0.98 | 95 | 244 | 226 | Yes | >0.99 |

*Note.* %ile=percentile

## TABLE 8. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING OHIO STATE TEST MATH LEVEL 3 (PROFICIENT) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING OHIO STATE TEST

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut Score | Level 3 | Prob. | | | Cut Score | Level 3 | Prob. |
| 3 | 5 | 169 | 202 | No | <0.01 | 5 | 176 | 202 | No | <0.01 |
| | 10 | 174 | 202 | No | 0.01 | 10 | 181 | 202 | No | <0.01 |
| | 15 | 177 | 202 | No | 0.04 | 15 | 184 | 202 | No | 0.01 |
| | 20 | 179 | 202 | No | 0.08 | 20 | 187 | 202 | No | 0.02 |
| | 25 | 182 | 202 | No | 0.17 | 25 | 189 | 202 | No | 0.05 |
| | 30 | 184 | 202 | No | 0.22 | 30 | 191 | 202 | No | 0.10 |
| | 35 | 185 | 202 | No | 0.27 | 35 | 193 | 202 | No | 0.20 |
| | 40 | 187 | 202 | No | 0.38 | 40 | 195 | 202 | No | 0.34 |
| | 45 | 189 | 202 | Yes | 0.50 | 45 | 197 | 202 | Yes | 0.50 |
| | 50 | 190 | 202 | Yes | 0.56 | 50 | 198 | 202 | Yes | 0.58 |
| | 55 | 192 | 202 | Yes | 0.68 | 55 | 200 | 202 | Yes | 0.74 |
| | 60 | 194 | 202 | Yes | 0.78 | 60 | 202 | 202 | Yes | 0.86 |
| | 65 | 195 | 202 | Yes | 0.83 | 65 | 203 | 202 | Yes | 0.90 |
| | 70 | 197 | 202 | Yes | 0.89 | 70 | 205 | 202 | Yes | 0.95 |
| | 75 | 199 | 202 | Yes | 0.92 | 75 | 207 | 202 | Yes | 0.98 |
| | 80 | 201 | 202 | Yes | 0.96 | 80 | 209 | 202 | Yes | 0.99 |
| | 85 | 204 | 202 | Yes | 0.99 | 85 | 212 | 202 | Yes | 1.00 |
| | 90 | 207 | 202 | Yes | 1.00 | 90 | 215 | 202 | Yes | 1.00 |
| | 95 | 212 | 202 | Yes | 1.00 | 95 | 220 | 202 | Yes | 1.00 |
| 4 | 5 | 179 | 210 | No | <0.01 | 5 | 185 | 210 | No | <0.01 |
| | 10 | 184 | 210 | No | 0.01 | 10 | 190 | 210 | No | <0.01 |
| | 15 | 188 | 210 | No | 0.06 | 15 | 194 | 210 | No | 0.01 |
| | 20 | 190 | 210 | No | 0.11 | 20 | 197 | 210 | No | 0.05 |
| | 25 | 193 | 210 | No | 0.22 | 25 | 199 | 210 | No | 0.10 |
| | 30 | 195 | 210 | No | 0.32 | 30 | 201 | 210 | No | 0.20 |
| | 35 | 197 | 210 | No | 0.44 | 35 | 203 | 210 | No | 0.34 |
| | 40 | 198 | 210 | Yes | 0.50 | 40 | 205 | 210 | Yes | 0.50 |
| | 45 | 200 | 210 | Yes | 0.62 | 45 | 207 | 210 | Yes | 0.66 |
| | 50 | 202 | 210 | Yes | 0.73 | 50 | 209 | 210 | Yes | 0.80 |
| | 55 | 204 | 210 | Yes | 0.83 | 55 | 211 | 210 | Yes | 0.90 |
| | 60 | 205 | 210 | Yes | 0.83 | 60 | 212 | 210 | Yes | 0.93 |
| | 65 | 207 | 210 | Yes | 0.89 | 65 | 214 | 210 | Yes | 0.97 |
| | 70 | 209 | 210 | Yes | 0.94 | 70 | 216 | 210 | Yes | 0.99 |
| | 75 | 211 | 210 | Yes | 0.97 | 75 | 218 | 210 | Yes | >0.99 |
| | 80 | 214 | 210 | Yes | 0.99 | 80 | 221 | 210 | Yes | >0.99 |
| | 85 | 216 | 210 | Yes | >0.99 | 85 | 223 | 210 | Yes | >0.99 |
| | 90 | 220 | 210 | Yes | >0.99 | 90 | 227 | 210 | Yes | >0.99 |
| | 95 | 225 | 210 | Yes | >0.99 | 95 | 232 | 210 | Yes | >0.99 |

TABLE 8. (CONTINUED)

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut-Score | Level 3 | Prob. | | | Cut-Score | Level 3 | Prob. |
| 5 | 5 | 187 | 219 | No | <0.01 | 5 | 192 | 219 | No | <0.01 |
| | 10 | 193 | 219 | No | 0.01 | 10 | 198 | 219 | No | <0.01 |
| | 15 | 196 | 219 | No | 0.03 | 15 | 201 | 219 | No | <0.01 |
| | 20 | 199 | 219 | No | 0.07 | 20 | 204 | 219 | No | 0.01 |
| | 25 | 202 | 219 | No | 0.15 | 25 | 207 | 219 | No | 0.05 |
| | 30 | 204 | 219 | No | 0.23 | 30 | 209 | 219 | No | 0.11 |
| | 35 | 206 | 219 | No | 0.33 | 35 | 211 | 219 | No | 0.20 |
| | 40 | 208 | 219 | No | 0.44 | 40 | 213 | 219 | No | 0.34 |
| | 45 | 210 | 219 | Yes | 0.56 | 45 | 215 | 219 | Yes | 0.50 |
| | 50 | 211 | 219 | Yes | 0.62 | 50 | 217 | 219 | Yes | 0.66 |
| | 55 | 213 | 219 | Yes | 0.72 | 55 | 219 | 219 | Yes | 0.80 |
| | 60 | 215 | 219 | Yes | 0.81 | 60 | 221 | 219 | Yes | 0.89 |
| | 65 | 217 | 219 | Yes | 0.88 | 65 | 223 | 219 | Yes | 0.95 |
| | 70 | 219 | 219 | Yes | 0.93 | 70 | 225 | 219 | Yes | 0.98 |
| | 75 | 221 | 219 | Yes | 0.96 | 75 | 228 | 219 | Yes | >0.99 |
| | 80 | 224 | 219 | Yes | 0.99 | 80 | 230 | 219 | Yes | >0.99 |
| | 85 | 227 | 219 | Yes | >0.99 | 85 | 233 | 219 | Yes | >0.99 |
| | 90 | 230 | 219 | Yes | >0.99 | 90 | 237 | 219 | Yes | >0.99 |
| | 95 | 236 | 219 | Yes | >0.99 | 95 | 242 | 219 | Yes | >0.99 |
| 6 | 5 | 192 | 224 | No | <0.01 | 5 | 196 | 224 | No | <0.01 |
| | 10 | 198 | 224 | No | <0.01 | 10 | 202 | 224 | No | <0.01 |
| | 15 | 202 | 224 | No | 0.02 | 15 | 205 | 224 | No | <0.01 |
| | 20 | 205 | 224 | No | 0.05 | 20 | 209 | 224 | No | 0.01 |
| | 25 | 207 | 224 | No | 0.09 | 25 | 211 | 224 | No | 0.02 |
| | 30 | 209 | 224 | No | 0.15 | 30 | 214 | 224 | No | 0.07 |
| | 35 | 212 | 224 | No | 0.28 | 35 | 216 | 224 | No | 0.15 |
| | 40 | 214 | 224 | No | 0.38 | 40 | 218 | 224 | No | 0.27 |
| | 45 | 216 | 224 | Yes | 0.50 | 45 | 220 | 224 | No | 0.42 |
| | 50 | 218 | 224 | Yes | 0.62 | 50 | 222 | 224 | Yes | 0.58 |
| | 55 | 220 | 224 | Yes | 0.72 | 55 | 224 | 224 | Yes | 0.73 |
| | 60 | 222 | 224 | Yes | 0.81 | 60 | 226 | 224 | Yes | 0.85 |
| | 65 | 224 | 224 | Yes | 0.88 | 65 | 228 | 224 | Yes | 0.93 |
| | 70 | 226 | 224 | Yes | 0.93 | 70 | 230 | 224 | Yes | 0.97 |
| | 75 | 228 | 224 | Yes | 0.96 | 75 | 233 | 224 | Yes | 0.99 |
| | 80 | 231 | 224 | Yes | 0.99 | 80 | 236 | 224 | Yes | >0.99 |
| | 85 | 234 | 224 | Yes | 0.99 | 85 | 239 | 224 | Yes | >0.99 |
| | 90 | 238 | 224 | Yes | >0.99 | 90 | 243 | 224 | Yes | >0.99 |
| | 95 | 243 | 224 | Yes | >0.99 | 95 | 248 | 224 | Yes | >0.99 |

TABLE 8. (CONTINUED)

| Grade | Start %ile | RIT Fall | Projected Proficiency | | | Start %ile | RIT Winter | Projected Proficiency | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cut-Score | Level 3 | Prob. | | | Cut-Score | Level 3 | Prob. |
| 7 | 5 | 195 | 232 | No | <0.01 | 5 | 198 | 232 | No | <0.01 |
| | 10 | 201 | 232 | No | <0.01 | 10 | 204 | 232 | No | <0.01 |
| | 15 | 205 | 232 | No | <0.01 | 15 | 208 | 232 | No | <0.01 |
| | 20 | 209 | 232 | No | <0.01 | 20 | 212 | 232 | No | <0.01 |
| | 25 | 211 | 232 | No | 0.01 | 25 | 215 | 232 | No | <0.01 |
| | 30 | 214 | 232 | No | 0.03 | 30 | 217 | 232 | No | <0.01 |
| | 35 | 216 | 232 | No | 0.06 | 35 | 220 | 232 | No | 0.02 |
| | 40 | 218 | 232 | No | 0.11 | 40 | 222 | 232 | No | 0.05 |
| | 45 | 221 | 232 | No | 0.22 | 45 | 224 | 232 | No | 0.10 |
| | 50 | 223 | 232 | No | 0.32 | 50 | 226 | 232 | No | 0.20 |
| | 55 | 225 | 232 | No | 0.44 | 55 | 228 | 232 | No | 0.34 |
| | 60 | 227 | 232 | Yes | 0.56 | 60 | 230 | 232 | Yes | 0.50 |
| | 65 | 229 | 232 | Yes | 0.68 | 65 | 233 | 232 | Yes | 0.74 |
| | 70 | 231 | 232 | Yes | 0.78 | 70 | 235 | 232 | Yes | 0.85 |
| | 75 | 234 | 232 | Yes | 0.89 | 75 | 238 | 232 | Yes | 0.95 |
| | 80 | 237 | 232 | Yes | 0.95 | 80 | 240 | 232 | Yes | 0.98 |
| | 85 | 240 | 232 | Yes | 0.98 | 85 | 244 | 232 | Yes | >0.99 |
| | 90 | 244 | 232 | Yes | >0.99 | 90 | 248 | 232 | Yes | >0.99 |
| | 95 | 250 | 232 | Yes | >0.99 | 95 | 254 | 232 | Yes | >0.99 |
| 8 | 5 | 197 | 235 | No | <0.01 | 5 | 199 | 235 | No | <0.01 |
| | 10 | 203 | 235 | No | <0.01 | 10 | 206 | 235 | No | <0.01 |
| | 15 | 208 | 235 | No | <0.01 | 15 | 210 | 235 | No | <0.01 |
| | 20 | 211 | 235 | No | 0.01 | 20 | 214 | 235 | No | <0.01 |
| | 25 | 214 | 235 | No | 0.02 | 25 | 217 | 235 | No | <0.01 |
| | 30 | 217 | 235 | No | 0.04 | 30 | 220 | 235 | No | <0.01 |
| | 35 | 219 | 235 | No | 0.08 | 35 | 222 | 235 | No | 0.01 |
| | 40 | 222 | 235 | No | 0.15 | 40 | 225 | 235 | No | 0.06 |
| | 45 | 224 | 235 | No | 0.22 | 45 | 227 | 235 | No | 0.12 |
| | 50 | 226 | 235 | No | 0.30 | 50 | 229 | 235 | No | 0.21 |
| | 55 | 229 | 235 | No | 0.45 | 55 | 231 | 235 | No | 0.35 |
| | 60 | 231 | 235 | Yes | 0.55 | 60 | 234 | 235 | Yes | 0.58 |
| | 65 | 233 | 235 | Yes | 0.65 | 65 | 236 | 235 | Yes | 0.72 |
| | 70 | 236 | 235 | Yes | 0.74 | 70 | 239 | 235 | Yes | 0.88 |
| | 75 | 238 | 235 | Yes | 0.82 | 75 | 241 | 235 | Yes | 0.94 |
| | 80 | 241 | 235 | Yes | 0.90 | 80 | 245 | 235 | Yes | 0.99 |
| | 85 | 245 | 235 | Yes | 0.97 | 85 | 248 | 235 | Yes | >0.99 |
| | 90 | 249 | 235 | Yes | 0.99 | 90 | 253 | 235 | Yes | >0.99 |
| | 95 | 256 | 235 | Yes | >0.99 | 95 | 259 | 235 | 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 Ohio state test performance level. By using matched score data from a sample of students from Ohio, 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 NWEA 2015 RIT Scale 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 on Ohio state 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 Ohio state tests and MAP tests, as they are not parallel in content, scores from these two tests should not be directly compared. Second, the sample data used in this study were collected from 11 school districts, which may limit the generalizability of 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 Ohio state test performance from other school districts in Ohio to enhance the quality and generalizability of the study.

# References

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# Appendix

## Data and Analysis

### Data

Data used in this study were collected from 11 school districts in Ohio. The sample contained matched Ohio state test ELA and MAP reading scores from 28,713 students in Grades 3 to 8 and matched Ohio state test and MAP math scores from 27,210 students in Grades 3 to 8 who completed both Ohio state tests and MAP in the spring of 2016.

To understand the statistical characteristics of the test scores, descriptive statistics are provided in Table A1. As Table A1 indicates, the correlation coefficients between MAP reading and Ohio state test ELA scores range from 0.73 to 0.77, and the correlation coefficients between MAP and Ohio state test math scores range from 0.73 to 0.82. All these correlations indicate a strong relationship between MAP and Ohio state test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

| | | | | OHIO STATE TEST | | | | MAP | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Subject** | **Grade** | **N** | ***r*** | **Mean** | **SD** | **Min** | **Max** | **Mean** | **SD** | **Min** | **Max** |
| **ELA/ Reading** | 3 | 5421 | 0.73 | 696.90 | 50.03 | 545 | 862 | 197.87 | 16.23 | 140 | 252 |
| | 4 | 4991 | 0.77 | 700.70 | 47.47 | 575 | 846 | 204.99 | 16.09 | 140 | 249 |
| | 5 | 4642 | 0.76 | 704.33 | 46.92 | 566 | 848 | 211.69 | 15.47 | 140 | 255 |
| | 6 | 4636 | 0.76 | 696.58 | 46.67 | 571 | 851 | 213.14 | 16.07 | 139 | 256 |
| | 7 | 4450 | 0.77 | 695.68 | 42.81 | 584 | 833 | 217.00 | 16.57 | 143 | 261 |
| | 8 | 4573 | 0.74 | 692.20 | 33.04 | 599 | 805 | 220.31 | 16.18 | 144 | 261 |
| **Math** | 3 | 5189 | 0.77 | 699.40 | 55.48 | 588 | 818 | 201.10 | 14.08 | 135 | 250 |
| | 4 | 5035 | 0.78 | 708.98 | 51.58 | 605 | 835 | 210.60 | 15.22 | 142 | 260 |
| | 5 | 4388 | 0.80 | 706.74 | 39.30 | 624 | 804 | 220.54 | 15.48 | 166 | 280 |
| | 6 | 4418 | 0.80 | 695.07 | 42.42 | 616 | 790 | 221.68 | 16.27 | 146 | 264 |
| | 7 | 4376 | 0.82 | 692.96 | 42.58 | 605 | 806 | 226.83 | 18.27 | 148 | 281 |
| | 8 | 3804 | 0.73 | 689.74 | 30.37 | 633 | 774 | 228.92 | 16.42 | 147 | 285 |

## Equipercentile Linking Procedure

The equipercentile procedure (e.g., Kolen & Brennan, 2004) was used to establish the concordance relationship between Ohio state test and MAP scores for grades 3 to 8 in ELA/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 concorded scores between two tests. $x$ is a score on Test $X$ (e.g., Ohio state test). 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 Ohio state test 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 be proficient (i.e., Level 3 or higher) on Ohio state tests.

To calculate consistency rate of classification, sample students were designated "Below Ohio state test cut" or "At or above Ohio state test cut" based on their actual Ohio state test 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 Ohio state test 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 Ohio state test 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 Ohio state test 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 Ohio state test cut scores. Students classified in the *false negative* (FN) category were those predicated to be Not Proficient based on the MAP cut scores but were classified as Proficient based on the Ohio state test 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 OHIO STATE TEST TO MAP CONCORDANCE

| | | Ohio State Test Score | |
|---|---|---|---|
| | | Below Ohio State Test Cut | At or Above Ohio State Test 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 Ohio state test based on that student's MAP scores in prior seasons (e.g. fall and winter). The probability of a student achieving Level 3 (Proficient) on Ohio state test, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(Achieveing\ Level\ 3\ in\ spring | a\ RIT\ score\ of\ x) = \Phi\left(\frac{x + g - c}{SD}\right) \qquad (A2)$$

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 3 on the Ohio state tests, based on his/her spring score $s$, it can be calculated by Equation (A3):

$$Pr(Achieveing\ Level\ 3\ in\ spring | a\ RIT\ score\ of\ s\ in\ spring) = \Phi\left(\frac{s - c}{SE}\right) \qquad (A3)$$

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