

# Linking the North Carolina EOG 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 North Carolina End-of-Grade (EOG) English language arts (ELA) 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 EOG ELA 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 3 (i.e., “Proficient”) or higher performance designation on the EOG 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

North Carolina EOG assessments include a series of achievement tests aligned to the Common Core State Standards (CCSS) in ELA and math for grades 3-8 and high school. EOG tests are delivered in the paper-and-pencil form. 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 aligned to the CCSS. Unlike EOG 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 **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 EOG Readiness Levels

Tables 1 to 4 report the EOG scaled scores associated with each of the five performance levels, as well as the estimated cut scores on the MAP tests associated with the EOG 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 EOG performance level, based on their observed MAP scores. For example, a 3<sup>rd</sup> grade student who obtained a MAP math score of 202 in the spring testing season is likely to be at the very high end of Level 3 (Proficient) on the EOG test taken during that same testing season (see Table 2). Similarly, a 6<sup>th</sup> grade student who obtained a MAP reading score of 230 in the fall testing season is likely to be at Level 5 on the EOG test taken in the spring of 6<sup>th</sup> grade (see Table 3).

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

| Grade | EOG     |  |         |  |                 |  |         |  |         |  |
|-------|---------|--|---------|--|-----------------|--|---------|--|---------|--|
|       | Level 1 |  | Level 2 |  | Level 3         |  | Level 4 |  | Level 5 |  |
| 3     | 406-431 |  | 432-438 |  | <b>439</b> -441 |  | 442-451 |  | 452-462 |  |
| 4     | 412-438 |  | 439-444 |  | <b>445</b> -447 |  | 448-459 |  | 460-468 |  |
| 5     | 419-442 |  | 443-449 |  | <b>450</b> -452 |  | 453-463 |  | 464-472 |  |
| 6     | 418-441 |  | 442-450 |  | <b>451</b> -453 |  | 454-464 |  | 465-478 |  |
| 7     | 419-444 |  | 445-453 |  | <b>454</b> -456 |  | 457-468 |  | 469-482 |  |
| 8     | 422-448 |  | 449-457 |  | <b>458</b> -461 |  | 462-472 |  | 473-487 |  |

  

| Grade | MAP     |      |         |       |                 |       |         |       |         |       |
|-------|---------|------|---------|-------|-----------------|-------|---------|-------|---------|-------|
|       | Level 1 |      | Level 2 |       | Level 3         |       | Level 4 |       | Level 5 |       |
|       | RIT     | %ile | RIT     | %ile  | RIT             | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-187 | 1-23 | 188-197 | 24-47 | <b>198</b> -201 | 48-57 | 202-214 | 58-85 | 215-350 | 86-99 |
| 4     | 100-196 | 1-26 | 197-205 | 27-48 | <b>206</b> -209 | 49-59 | 210-225 | 60-90 | 226-350 | 91-99 |
| 5     | 100-203 | 1-28 | 204-212 | 29-51 | <b>213</b> -216 | 52-62 | 217-231 | 63-90 | 232-350 | 91-99 |
| 6     | 100-200 | 1-14 | 201-213 | 15-43 | <b>214</b> -217 | 44-54 | 218-230 | 55-84 | 231-350 | 85-99 |
| 7     | 100-203 | 1-16 | 204-216 | 17-45 | <b>217</b> -220 | 46-56 | 221-235 | 57-87 | 236-350 | 88-99 |
| 8     | 100-207 | 1-21 | 208-220 | 22-51 | <b>221</b> -225 | 52-63 | 226-240 | 64-90 | 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 EOG AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

| Grade | EOG     |  |         |  |                 |  |         |  |         |  |
|-------|---------|--|---------|--|-----------------|--|---------|--|---------|--|
|       | Level 1 |  | Level 2 |  | Level 3         |  | Level 4 |  | Level 5 |  |
| 3     | 422-439 |  | 440-447 |  | <b>448</b> -450 |  | 451-459 |  | 460-472 |  |
| 4     | 424-440 |  | 441-448 |  | <b>449</b> -450 |  | 451-459 |  | 460-473 |  |
| 5     | 426-440 |  | 441-448 |  | <b>449</b> -450 |  | 451-459 |  | 460-475 |  |
| 6     | 428-443 |  | 444-450 |  | <b>451</b> -452 |  | 453-460 |  | 461-476 |  |
| 7     | 428-443 |  | 444-450 |  | <b>451</b> -452 |  | 453-460 |  | 461-476 |  |
| 8     | 426-443 |  | 444-451 |  | <b>452</b> -453 |  | 454-462 |  | 463-477 |  |

  

| Grade | MAP     |      |         |       |                 |       |         |       |         |       |
|-------|---------|------|---------|-------|-----------------|-------|---------|-------|---------|-------|
|       | Level 1 |      | Level 2 |       | Level 3         |       | Level 4 |       | Level 5 |       |
|       | RIT     | %ile | RIT     | %ile  | RIT             | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-189 | 1-15 | 190-199 | 16-38 | <b>200</b> -202 | 39-47 | 203-213 | 48-76 | 214-350 | 77-99 |
| 4     | 100-202 | 1-23 | 203-212 | 24-47 | <b>213</b> -215 | 48-55 | 216-227 | 56-82 | 228-350 | 83-99 |
| 5     | 100-209 | 1-23 | 210-221 | 24-50 | <b>222</b> -224 | 51-57 | 225-237 | 58-84 | 238-350 | 85-99 |
| 6     | 100-216 | 1-29 | 217-227 | 30-55 | <b>228</b> -230 | 56-62 | 231-241 | 63-83 | 242-350 | 84-99 |
| 7     | 100-221 | 1-34 | 222-232 | 35-58 | <b>233</b> -235 | 59-65 | 236-248 | 66-86 | 249-350 | 87-99 |
| 8     | 100-223 | 1-34 | 224-238 | 35-65 | <b>239</b> -242 | 66-72 | 243-256 | 73-90 | 257-350 | 91-99 |

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

| Grade | EOG     |  |         |  |                |  |         |  |         |  |
|-------|---------|--|---------|--|----------------|--|---------|--|---------|--|
|       | Level 1 |  | Level 2 |  | Level 3        |  | Level 4 |  | Level 5 |  |
| 3     | 406-431 |  | 432-438 |  | <b>439-441</b> |  | 442-451 |  | 452-462 |  |
| 4     | 412-438 |  | 439-444 |  | <b>445-447</b> |  | 448-459 |  | 460-468 |  |
| 5     | 419-442 |  | 443-449 |  | <b>450-452</b> |  | 453-463 |  | 464-472 |  |
| 6     | 418-441 |  | 442-450 |  | <b>451-453</b> |  | 454-464 |  | 465-478 |  |
| 7     | 419-444 |  | 445-453 |  | <b>454-456</b> |  | 457-468 |  | 469-482 |  |
| 8     | 422-448 |  | 449-457 |  | <b>458-461</b> |  | 462-472 |  | 473-487 |  |

  

| Grade | MAP FALL |      |         |       |                |       |         |       |         |       |
|-------|----------|------|---------|-------|----------------|-------|---------|-------|---------|-------|
|       | Level 1  |      | Level 2 |       | Level 3        |       | Level 4 |       | Level 5 |       |
|       | RIT      | %ile | RIT     | %ile  | RIT            | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-175  | 1-20 | 176-186 | 21-45 | <b>187-191</b> | 46-58 | 192-207 | 59-88 | 208-350 | 89-99 |
| 4     | 100-187  | 1-24 | 188-197 | 25-48 | <b>198-202</b> | 49-60 | 203-220 | 61-92 | 221-350 | 93-99 |
| 5     | 100-196  | 1-27 | 197-206 | 28-52 | <b>207-211</b> | 53-64 | 212-228 | 65-93 | 229-350 | 94-99 |
| 6     | 100-193  | 1-12 | 194-208 | 13-43 | <b>209-213</b> | 44-56 | 214-228 | 57-87 | 229-350 | 88-99 |
| 7     | 100-197  | 1-13 | 198-212 | 14-44 | <b>213-217</b> | 45-57 | 218-233 | 58-89 | 234-350 | 90-99 |
| 8     | 100-202  | 1-17 | 203-217 | 18-50 | <b>218-223</b> | 51-65 | 224-238 | 66-91 | 239-350 | 92-99 |

  

| Grade | MAP WINTER |      |         |       |                |       |         |       |         |       |
|-------|------------|------|---------|-------|----------------|-------|---------|-------|---------|-------|
|       | Level 1    |      | Level 2 |       | Level 3        |       | Level 4 |       | Level 5 |       |
|       | RIT        | %ile | RIT     | %ile  | RIT            | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-183    | 1-21 | 184-194 | 22-47 | <b>195-198</b> | 48-57 | 199-212 | 58-86 | 213-350 | 87-99 |
| 4     | 100-193    | 1-24 | 194-203 | 25-49 | <b>204-207</b> | 50-60 | 208-224 | 61-91 | 225-350 | 92-99 |
| 5     | 100-201    | 1-28 | 202-210 | 29-51 | <b>211-214</b> | 52-62 | 215-230 | 63-92 | 231-350 | 93-99 |
| 6     | 100-198    | 1-13 | 199-211 | 14-42 | <b>212-216</b> | 43-56 | 217-229 | 57-85 | 230-350 | 86-99 |
| 7     | 100-201    | 1-15 | 202-215 | 16-46 | <b>216-219</b> | 47-56 | 220-234 | 57-87 | 235-350 | 88-99 |
| 8     | 100-205    | 1-18 | 206-219 | 19-51 | <b>220-224</b> | 52-63 | 225-239 | 64-90 | 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 EOG AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING EOG TESTS)

| Grade | EOG     |  |         |  |                 |  |         |  |         |  |
|-------|---------|--|---------|--|-----------------|--|---------|--|---------|--|
|       | Level 1 |  | Level 2 |  | Level 3         |  | Level 4 |  | Level 5 |  |
| 3     | 422-439 |  | 440-447 |  | <b>448</b> -450 |  | 451-459 |  | 460-472 |  |
| 4     | 424-440 |  | 441-448 |  | <b>449</b> -450 |  | 451-459 |  | 460-473 |  |
| 5     | 426-440 |  | 441-448 |  | <b>449</b> -450 |  | 451-459 |  | 460-475 |  |
| 6     | 428-443 |  | 444-450 |  | <b>451</b> -452 |  | 453-460 |  | 461-476 |  |
| 7     | 428-443 |  | 444-450 |  | <b>451</b> -452 |  | 453-460 |  | 461-476 |  |
| 8     | 426-443 |  | 444-451 |  | <b>452</b> -453 |  | 454-462 |  | 463-477 |  |

  

| Grade | MAP FALL |      |         |       |                 |       |         |       |         |       |
|-------|----------|------|---------|-------|-----------------|-------|---------|-------|---------|-------|
|       | Level 1  |      | Level 2 |       | Level 3         |       | Level 4 |       | Level 5 |       |
|       | RIT      | %ile | RIT     | %ile  | RIT             | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-175  | 1-12 | 176-186 | 13-38 | <b>187</b> -189 | 39-47 | 190-201 | 48-80 | 202-350 | 81-99 |
| 4     | 100-190  | 1-20 | 191-200 | 21-45 | <b>201</b> -203 | 46-54 | 204-216 | 55-85 | 217-350 | 86-99 |
| 5     | 100-199  | 1-20 | 200-211 | 21-50 | <b>212</b> -214 | 51-58 | 215-227 | 59-86 | 228-350 | 87-99 |
| 6     | 100-208  | 1-27 | 209-219 | 28-54 | <b>220</b> -222 | 55-62 | 223-234 | 63-86 | 235-350 | 87-99 |
| 7     | 100-215  | 1-33 | 216-226 | 34-59 | <b>227</b> -229 | 60-66 | 230-242 | 67-88 | 243-350 | 89-99 |
| 8     | 100-218  | 1-33 | 219-234 | 34-67 | <b>235</b> -238 | 68-75 | 239-252 | 76-92 | 253-350 | 93-99 |

  

| Grade | MAP WINTER |      |         |       |                 |       |         |       |         |       |
|-------|------------|------|---------|-------|-----------------|-------|---------|-------|---------|-------|
|       | Level 1    |      | Level 2 |       | Level 3         |       | Level 4 |       | Level 5 |       |
|       | RIT        | %ile | RIT     | %ile  | RIT             | %ile  | RIT     | %ile  | RIT     | %ile  |
| 3     | 100-183    | 1-13 | 184-194 | 14-39 | <b>195</b> -197 | 40-47 | 198-208 | 48-78 | 209-350 | 79-99 |
| 4     | 100-197    | 1-21 | 198-207 | 22-46 | <b>208</b> -210 | 47-54 | 211-222 | 55-83 | 223-350 | 84-99 |
| 5     | 100-205    | 1-22 | 206-217 | 23-50 | <b>218</b> -220 | 51-58 | 221-233 | 59-85 | 234-350 | 86-99 |
| 6     | 100-213    | 1-29 | 214-224 | 30-56 | <b>225</b> -227 | 57-63 | 228-238 | 64-84 | 239-350 | 85-99 |
| 7     | 100-219    | 1-34 | 220-230 | 35-60 | <b>231</b> -233 | 61-66 | 234-246 | 67-88 | 247-350 | 89-99 |
| 8     | 100-221    | 1-33 | 222-236 | 34-65 | <b>237</b> -240 | 66-73 | 241-254 | 74-91 | 255-350 | 92-99 |

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 in the EOG 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 whose score below both concordant scores on each test. Higher consistency rate indicates stronger congruence between EOG 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 EOG ELA test approximately 82% of the time and MAP math scores can consistently classify students on EOG math test approximately 85% 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 EOG tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND EOG LEVEL 3 EQUIPERCENTILE CONCORDANCES

| Grade | ELA/Reading      |           |           | Math             |           |           |
|-------|------------------|-----------|-----------|------------------|-----------|-----------|
|       | Consistency Rate | False     |           | Consistency Rate | False     |           |
|       |                  | Positives | Negatives |                  | Positives | Negatives |
| 3     | 0.83             | 0.08      | 0.09      | 0.83             | 0.07      | 0.10      |
| 4     | 0.82             | 0.09      | 0.09      | 0.86             | 0.07      | 0.07      |
| 5     | 0.81             | 0.09      | 0.10      | 0.85             | 0.07      | 0.08      |
| 6     | 0.82             | 0.09      | 0.09      | 0.85             | 0.06      | 0.09      |
| 7     | 0.81             | 0.09      | 0.10      | 0.86             | 0.07      | 0.07      |
| 8     | 0.82             | 0.09      | 0.09      | 0.86             | 0.06      | 0.08      |



## Proficiency Projection

Proficiency projection tells how likely a student is classified as “proficient” on EOG 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 EOG tests are presented in Tables 6 to 8. These tables estimate the probability of scoring at Level 3 or above on EOG 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 192 in the fall, the probability of obtaining a Level 3 or higher EOG score in the spring of 3<sup>rd</sup> 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 EOG tests.

TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING EOG 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        | 198                   | No      | <0.01 | 5          | 181        | 200                   | No      | <0.01 |
|       | 10          | 179        | 198                   | No      | <0.01 | 10         | 186        | 200                   | No      | <0.01 |
|       | 15          | 183        | 198                   | No      | <0.01 | 15         | 189        | 200                   | No      | <0.01 |
|       | 20          | 186        | 198                   | No      | <0.01 | 20         | 192        | 200                   | No      | <0.01 |
|       | 25          | 188        | 198                   | No      | <0.01 | 25         | 194        | 200                   | No      | 0.02  |
|       | 30          | 191        | 198                   | No      | 0.01  | 30         | 196        | 200                   | No      | 0.08  |
|       | 35          | 193        | 198                   | No      | 0.06  | 35         | 198        | 200                   | No      | 0.25  |
|       | 40          | 195        | 198                   | No      | 0.17  | 40         | 200        | 200                   | Yes     | 0.50  |
|       | 45          | 197        | 198                   | No      | 0.38  | 45         | 202        | 200                   | Yes     | 0.75  |
|       | 50          | 199        | 198                   | Yes     | 0.62  | 50         | 203        | 200                   | Yes     | 0.85  |
|       | 55          | 201        | 198                   | Yes     | 0.83  | 55         | 205        | 200                   | Yes     | 0.96  |
|       | 60          | 202        | 198                   | Yes     | 0.89  | 60         | 207        | 200                   | Yes     | 0.99  |
|       | 65          | 204        | 198                   | Yes     | 0.97  | 65         | 209        | 200                   | Yes     | >0.99 |
|       | 70          | 207        | 198                   | Yes     | >0.99 | 70         | 211        | 200                   | Yes     | >0.99 |
|       | 75          | 209        | 198                   | Yes     | >0.99 | 75         | 213        | 200                   | Yes     | >0.99 |
|       | 80          | 211        | 198                   | Yes     | >0.99 | 80         | 215        | 200                   | Yes     | >0.99 |
| 85    | 214         | 198        | Yes                   | >0.99   | 85    | 218        | 200        | Yes                   | >0.99   |       |
| 90    | 218         | 198        | Yes                   | >0.99   | 90    | 221        | 200        | Yes                   | >0.99   |       |
| 95    | 223         | 198        | Yes                   | >0.99   | 95    | 226        | 200        | Yes                   | >0.99   |       |
| 4     | 5           | 181        | 206                   | No      | <0.01 | 5          | 189        | 213                   | No      | <0.01 |
|       | 10          | 187        | 206                   | No      | <0.01 | 10         | 194        | 213                   | No      | <0.01 |
|       | 15          | 190        | 206                   | No      | <0.01 | 15         | 198        | 213                   | No      | <0.01 |
|       | 20          | 193        | 206                   | No      | <0.01 | 20         | 201        | 213                   | No      | <0.01 |
|       | 25          | 196        | 206                   | No      | <0.01 | 25         | 203        | 213                   | No      | <0.01 |
|       | 30          | 198        | 206                   | No      | 0.01  | 30         | 206        | 213                   | No      | 0.01  |
|       | 35          | 200        | 206                   | No      | 0.03  | 35         | 208        | 213                   | No      | 0.04  |
|       | 40          | 202        | 206                   | No      | 0.11  | 40         | 210        | 213                   | No      | 0.15  |
|       | 45          | 204        | 206                   | No      | 0.27  | 45         | 212        | 213                   | No      | 0.37  |
|       | 50          | 206        | 206                   | Yes     | 0.50  | 50         | 213        | 213                   | Yes     | 0.50  |
|       | 55          | 208        | 206                   | Yes     | 0.73  | 55         | 215        | 213                   | Yes     | 0.75  |
|       | 60          | 210        | 206                   | Yes     | 0.89  | 60         | 217        | 213                   | Yes     | 0.92  |
|       | 65          | 212        | 206                   | Yes     | 0.97  | 65         | 219        | 213                   | Yes     | 0.98  |
|       | 70          | 214        | 206                   | Yes     | 0.99  | 70         | 221        | 213                   | Yes     | >0.99 |
|       | 75          | 216        | 206                   | Yes     | >0.99 | 75         | 224        | 213                   | Yes     | >0.99 |
|       | 80          | 218        | 206                   | Yes     | >0.99 | 80         | 226        | 213                   | Yes     | >0.99 |
| 85    | 221         | 206        | Yes                   | >0.99   | 85    | 229        | 213        | Yes                   | >0.99   |       |
| 90    | 225         | 206        | Yes                   | >0.99   | 90    | 233        | 213        | Yes                   | >0.99   |       |
| 95    | 230         | 206        | Yes                   | >0.99   | 95    | 238        | 213        | 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        | 222                   | No      | <0.01 |
|       | 10          | 193        | 213                   | No      | <0.01 | 10         | 201        | 222                   | No      | <0.01 |
|       | 15          | 197        | 213                   | No      | <0.01 | 15         | 205        | 222                   | No      | <0.01 |
|       | 20          | 199        | 213                   | No      | <0.01 | 20         | 208        | 222                   | No      | <0.01 |
|       | 25          | 202        | 213                   | No      | <0.01 | 25         | 210        | 222                   | No      | <0.01 |
|       | 30          | 204        | 213                   | No      | <0.01 | 30         | 213        | 222                   | No      | <0.01 |
|       | 35          | 206        | 213                   | No      | 0.01  | 35         | 215        | 222                   | No      | 0.01  |
|       | 40          | 208        | 213                   | No      | 0.06  | 40         | 217        | 222                   | No      | 0.04  |
|       | 45          | 210        | 213                   | No      | 0.17  | 45         | 219        | 222                   | No      | 0.15  |
|       | 50          | 212        | 213                   | No      | 0.38  | 50         | 221        | 222                   | No      | 0.37  |
|       | 55          | 214        | 213                   | Yes     | 0.62  | 55         | 223        | 222                   | Yes     | 0.63  |
|       | 60          | 216        | 213                   | Yes     | 0.83  | 60         | 225        | 222                   | Yes     | 0.85  |
|       | 65          | 217        | 213                   | Yes     | 0.89  | 65         | 228        | 222                   | Yes     | 0.98  |
|       | 70          | 220        | 213                   | Yes     | 0.99  | 70         | 230        | 222                   | Yes     | >0.99 |
|       | 75          | 222        | 213                   | Yes     | >0.99 | 75         | 232        | 222                   | Yes     | >0.99 |
|       | 80          | 224        | 213                   | Yes     | >0.99 | 80         | 235        | 222                   | Yes     | >0.99 |
| 85    | 227         | 213        | Yes                   | >0.99   | 85    | 238        | 222        | Yes                   | >0.99   |       |
| 90    | 231         | 213        | Yes                   | >0.99   | 90    | 242        | 222        | Yes                   | >0.99   |       |
| 95    | 236         | 213        | Yes                   | >0.99   | 95    | 248        | 222        | Yes                   | >0.99   |       |
| 6     | 5           | 192        | 214                   | No      | <0.01 | 5          | 198        | 228                   | No      | <0.01 |
|       | 10          | 197        | 214                   | No      | <0.01 | 10         | 204        | 228                   | No      | <0.01 |
|       | 15          | 201        | 214                   | No      | <0.01 | 15         | 208        | 228                   | No      | <0.01 |
|       | 20          | 203        | 214                   | No      | <0.01 | 20         | 211        | 228                   | No      | <0.01 |
|       | 25          | 206        | 214                   | No      | 0.01  | 25         | 214        | 228                   | No      | <0.01 |
|       | 30          | 208        | 214                   | No      | 0.03  | 30         | 217        | 228                   | No      | <0.01 |
|       | 35          | 210        | 214                   | No      | 0.11  | 35         | 219        | 228                   | No      | <0.01 |
|       | 40          | 212        | 214                   | No      | 0.27  | 40         | 221        | 228                   | No      | 0.01  |
|       | 45          | 214        | 214                   | Yes     | 0.50  | 45         | 223        | 228                   | No      | 0.04  |
|       | 50          | 216        | 214                   | Yes     | 0.73  | 50         | 225        | 228                   | No      | 0.15  |
|       | 55          | 218        | 214                   | Yes     | 0.89  | 55         | 227        | 228                   | No      | 0.37  |
|       | 60          | 219        | 214                   | Yes     | 0.94  | 60         | 230        | 228                   | Yes     | 0.75  |
|       | 65          | 221        | 214                   | Yes     | 0.99  | 65         | 232        | 228                   | Yes     | 0.92  |
|       | 70          | 223        | 214                   | Yes     | >0.99 | 70         | 234        | 228                   | Yes     | 0.98  |
|       | 75          | 226        | 214                   | Yes     | >0.99 | 75         | 237        | 228                   | Yes     | >0.99 |
|       | 80          | 228        | 214                   | Yes     | >0.99 | 80         | 239        | 228                   | Yes     | >0.99 |
| 85    | 231         | 214        | Yes                   | >0.99   | 85    | 243        | 228        | Yes                   | >0.99   |       |
| 90    | 235         | 214        | Yes                   | >0.99   | 90    | 247        | 228        | Yes                   | >0.99   |       |
| 95    | 240         | 214        | Yes                   | >0.99   | 95    | 253        | 228        | 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        | 217                   | No      | <0.01 | 5          | 199        | 233                   | No      | <0.01 |
|       | 10          | 199        | 217                   | No      | <0.01 | 10         | 206        | 233                   | No      | <0.01 |
|       | 15          | 202        | 217                   | No      | <0.01 | 15         | 210        | 233                   | No      | <0.01 |
|       | 20          | 205        | 217                   | No      | <0.01 | 20         | 214        | 233                   | No      | <0.01 |
|       | 25          | 208        | 217                   | No      | <0.01 | 25         | 217        | 233                   | No      | <0.01 |
|       | 30          | 210        | 217                   | No      | 0.01  | 30         | 219        | 233                   | No      | <0.01 |
|       | 35          | 212        | 217                   | No      | 0.06  | 35         | 222        | 233                   | No      | <0.01 |
|       | 40          | 214        | 217                   | No      | 0.17  | 40         | 224        | 233                   | No      | <0.01 |
|       | 45          | 216        | 217                   | No      | 0.38  | 45         | 226        | 233                   | No      | 0.01  |
|       | 50          | 218        | 217                   | Yes     | 0.62  | 50         | 229        | 233                   | No      | 0.08  |
|       | 55          | 220        | 217                   | Yes     | 0.83  | 55         | 231        | 233                   | No      | 0.25  |
|       | 60          | 222        | 217                   | Yes     | 0.94  | 60         | 233        | 233                   | Yes     | 0.50  |
|       | 65          | 224        | 217                   | Yes     | 0.99  | 65         | 235        | 233                   | Yes     | 0.75  |
|       | 70          | 226        | 217                   | Yes     | >0.99 | 70         | 238        | 233                   | Yes     | 0.96  |
|       | 75          | 228        | 217                   | Yes     | >0.99 | 75         | 241        | 233                   | Yes     | >0.99 |
|       | 8           | 5          | 194                   | 221     | No    | <0.01      | 5          | 199                   | 239     | No    |
| 10    |             | 200        | 221                   | No      | <0.01 | 10         | 206        | 239                   | No      | <0.01 |
| 15    |             | 204        | 221                   | No      | <0.01 | 15         | 211        | 239                   | No      | <0.01 |
| 20    |             | 207        | 221                   | No      | <0.01 | 20         | 215        | 239                   | No      | <0.01 |
| 25    |             | 209        | 221                   | No      | <0.01 | 25         | 218        | 239                   | No      | <0.01 |
| 30    |             | 212        | 221                   | No      | <0.01 | 30         | 221        | 239                   | No      | <0.01 |
| 35    |             | 214        | 221                   | No      | 0.01  | 35         | 224        | 239                   | No      | <0.01 |
| 40    |             | 216        | 221                   | No      | 0.06  | 40         | 226        | 239                   | No      | <0.01 |
| 45    |             | 218        | 221                   | No      | 0.17  | 45         | 229        | 239                   | No      | <0.01 |
| 50    |             | 220        | 221                   | No      | 0.38  | 50         | 231        | 239                   | No      | <0.01 |
| 55    |             | 222        | 221                   | Yes     | 0.62  | 55         | 233        | 239                   | No      | 0.02  |
| 60    |             | 224        | 221                   | Yes     | 0.83  | 60         | 236        | 239                   | No      | 0.15  |
| 65    |             | 226        | 221                   | Yes     | 0.94  | 65         | 238        | 239                   | No      | 0.37  |
| 70    |             | 228        | 221                   | Yes     | 0.99  | 70         | 241        | 239                   | Yes     | 0.75  |
| 75    |             | 231        | 221                   | Yes     | >0.99 | 75         | 244        | 239                   | Yes     | 0.96  |
| 80    |             | 233        | 221                   | Yes     | >0.99 | 80         | 247        | 239                   | Yes     | >0.99 |
| 85    | 236         | 221        | Yes                   | >0.99   | 85    | 251        | 239        | Yes                   | >0.99   |       |
| 90    | 240         | 221        | Yes                   | >0.99   | 90    | 255        | 239        | Yes                   | >0.99   |       |
| 95    | 246         | 221        | Yes                   | >0.99   | 95    | 262        | 239        | Yes                   | >0.99   |       |

Note. %ile=percentile

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

| 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      | 198                   | No      | <0.01 | 5          | 171        | 198                   | No      | <0.01 |
|       | 10         | 168      | 198                   | No      | 0.01  | 10         | 176        | 198                   | No      | <0.01 |
|       | 15         | 172      | 198                   | No      | 0.03  | 15         | 180        | 198                   | No      | <0.01 |
|       | 20         | 175      | 198                   | No      | 0.06  | 20         | 183        | 198                   | No      | 0.02  |
|       | 25         | 178      | 198                   | No      | 0.13  | 25         | 185        | 198                   | No      | 0.04  |
|       | 30         | 180      | 198                   | No      | 0.20  | 30         | 188        | 198                   | No      | 0.13  |
|       | 35         | 182      | 198                   | No      | 0.24  | 35         | 190        | 198                   | No      | 0.17  |
|       | 40         | 184      | 198                   | No      | 0.34  | 40         | 192        | 198                   | No      | 0.28  |
|       | 45         | 186      | 198                   | No      | 0.44  | 45         | 194        | 198                   | No      | 0.42  |
|       | 50         | 188      | 198                   | Yes     | 0.50  | 50         | 196        | 198                   | Yes     | 0.58  |
|       | 55         | 190      | 198                   | Yes     | 0.61  | 55         | 198        | 198                   | Yes     | 0.72  |
|       | 60         | 192      | 198                   | Yes     | 0.71  | 60         | 199        | 198                   | Yes     | 0.78  |
|       | 65         | 194      | 198                   | Yes     | 0.76  | 65         | 201        | 198                   | Yes     | 0.87  |
|       | 70         | 197      | 198                   | Yes     | 0.87  | 70         | 204        | 198                   | Yes     | 0.96  |
|       | 75         | 199      | 198                   | Yes     | 0.92  | 75         | 206        | 198                   | Yes     | 0.97  |
|       | 80         | 202      | 198                   | Yes     | 0.95  | 80         | 208        | 198                   | Yes     | 0.99  |
|       | 85         | 205      | 198                   | Yes     | 0.98  | 85         | 211        | 198                   | Yes     | >0.99 |
| 90    | 209        | 198      | Yes                   | 0.99    | 90    | 215        | 198        | Yes                   | >0.99   |       |
| 95    | 214        | 198      | Yes                   | >0.99   | 95    | 221        | 198        | Yes                   | >0.99   |       |
| 4     | 5          | 173      | 206                   | No      | <0.01 | 5          | 179        | 206                   | No      | <0.01 |
|       | 10         | 178      | 206                   | No      | 0.01  | 10         | 184        | 206                   | No      | <0.01 |
|       | 15         | 182      | 206                   | No      | 0.02  | 15         | 188        | 206                   | No      | <0.01 |
|       | 20         | 185      | 206                   | No      | 0.05  | 20         | 191        | 206                   | No      | 0.01  |
|       | 25         | 188      | 206                   | No      | 0.09  | 25         | 194        | 206                   | No      | 0.04  |
|       | 30         | 190      | 206                   | No      | 0.15  | 30         | 196        | 206                   | No      | 0.08  |
|       | 35         | 192      | 206                   | No      | 0.23  | 35         | 198        | 206                   | No      | 0.16  |
|       | 40         | 194      | 206                   | No      | 0.27  | 40         | 200        | 206                   | No      | 0.28  |
|       | 45         | 196      | 206                   | No      | 0.38  | 45         | 202        | 206                   | No      | 0.35  |
|       | 50         | 198      | 206                   | Yes     | 0.50  | 50         | 204        | 206                   | Yes     | 0.50  |
|       | 55         | 200      | 206                   | Yes     | 0.56  | 55         | 205        | 206                   | Yes     | 0.58  |
|       | 60         | 202      | 206                   | Yes     | 0.67  | 60         | 207        | 206                   | Yes     | 0.72  |
|       | 65         | 204      | 206                   | Yes     | 0.77  | 65         | 209        | 206                   | Yes     | 0.84  |
|       | 70         | 206      | 206                   | Yes     | 0.85  | 70         | 211        | 206                   | Yes     | 0.92  |
|       | 75         | 209      | 206                   | Yes     | 0.91  | 75         | 214        | 206                   | Yes     | 0.98  |
|       | 80         | 211      | 206                   | Yes     | 0.95  | 80         | 216        | 206                   | Yes     | 0.99  |
|       | 85         | 214      | 206                   | Yes     | 0.97  | 85         | 219        | 206                   | Yes     | >0.99 |
| 90    | 218        | 206      | Yes                   | 0.99    | 90    | 223        | 206        | Yes                   | >0.99   |       |
| 95    | 224        | 206      | Yes                   | >0.99   | 95    | 228        | 206        | 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      | 214                   | No      | <0.01 | 5          | 190        | 214                   | No      | <0.01 |
|       | 10         | 192      | 214                   | No      | 0.01  | 10         | 196        | 214                   | No      | <0.01 |
|       | 15         | 196      | 214                   | No      | 0.06  | 15         | 199        | 214                   | No      | 0.01  |
|       | 20         | 198      | 214                   | No      | 0.07  | 20         | 202        | 214                   | No      | 0.03  |
|       | 25         | 201      | 214                   | No      | 0.16  | 25         | 204        | 214                   | No      | 0.06  |
|       | 30         | 203      | 214                   | No      | 0.23  | 30         | 207        | 214                   | No      | 0.17  |
|       | 35         | 205      | 214                   | No      | 0.33  | 35         | 209        | 214                   | No      | 0.28  |
|       | 40         | 207      | 214                   | No      | 0.39  | 40         | 211        | 214                   | No      | 0.42  |
|       | 45         | 209      | 214                   | Yes     | 0.50  | 45         | 212        | 214                   | Yes     | 0.50  |
|       | 50         | 211      | 214                   | Yes     | 0.61  | 50         | 214        | 214                   | Yes     | 0.65  |
|       | 55         | 213      | 214                   | Yes     | 0.72  | 55         | 216        | 214                   | Yes     | 0.72  |
|       | 60         | 215      | 214                   | Yes     | 0.77  | 60         | 218        | 214                   | Yes     | 0.83  |
|       | 65         | 217      | 214                   | Yes     | 0.84  | 65         | 220        | 214                   | Yes     | 0.91  |
|       | 70         | 219      | 214                   | Yes     | 0.90  | 70         | 222        | 214                   | Yes     | 0.96  |
|       | 75         | 221      | 214                   | Yes     | 0.93  | 75         | 224        | 214                   | Yes     | 0.98  |
|       | 80         | 224      | 214                   | Yes     | 0.97  | 80         | 226        | 214                   | Yes     | 0.99  |
|       | 85         | 226      | 214                   | Yes     | 0.99  | 85         | 229        | 214                   | Yes     | >0.99 |
| 90    | 230        | 214      | Yes                   | >0.99   | 90    | 233        | 214        | Yes                   | >0.99   |       |
| 95    | 236        | 214      | Yes                   | >0.99   | 95    | 238        | 214        | 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      | 217                   | No      | <0.01 | 5          | 192        | 217                   | No      | <0.01 |
|       | 10         | 195      | 217                   | No      | 0.01  | 10         | 198        | 217                   | No      | <0.01 |
|       | 15         | 199      | 217                   | No      | 0.04  | 15         | 201        | 217                   | No      | <0.01 |
|       | 20         | 202      | 217                   | No      | 0.07  | 20         | 204        | 217                   | No      | 0.02  |
|       | 25         | 204      | 217                   | No      | 0.12  | 25         | 207        | 217                   | No      | 0.06  |
|       | 30         | 206      | 217                   | No      | 0.19  | 30         | 209        | 217                   | No      | 0.12  |
|       | 35         | 209      | 217                   | No      | 0.28  | 35         | 211        | 217                   | No      | 0.22  |
|       | 40         | 211      | 217                   | No      | 0.39  | 40         | 213        | 217                   | No      | 0.28  |
|       | 45         | 213      | 217                   | Yes     | 0.50  | 45         | 215        | 217                   | No      | 0.42  |
|       | 50         | 214      | 217                   | Yes     | 0.56  | 50         | 217        | 217                   | Yes     | 0.58  |
|       | 55         | 216      | 217                   | Yes     | 0.61  | 55         | 219        | 217                   | Yes     | 0.72  |
|       | 60         | 218      | 217                   | Yes     | 0.72  | 60         | 221        | 217                   | Yes     | 0.83  |
|       | 65         | 220      | 217                   | Yes     | 0.81  | 65         | 223        | 217                   | Yes     | 0.91  |
|       | 70         | 222      | 217                   | Yes     | 0.88  | 70         | 225        | 217                   | Yes     | 0.96  |
|       | 75         | 225      | 217                   | Yes     | 0.93  | 75         | 227        | 217                   | Yes     | 0.98  |
|       | 80         | 227      | 217                   | Yes     | 0.96  | 80         | 230        | 217                   | Yes     | >0.99 |
|       | 85         | 230      | 217                   | Yes     | 0.99  | 85         | 232        | 217                   | Yes     | >0.99 |
| 90    | 234        | 217      | Yes                   | >0.99   | 90    | 236        | 217        | Yes                   | >0.99   |       |
| 95    | 240        | 217      | Yes                   | >0.99   | 95    | 242        | 217        | Yes                   | >0.99   |       |
| 8     | 5          | 191      | 221                   | No      | <0.01 | 5          | 194        | 221                   | No      | <0.01 |
|       | 10         | 197      | 221                   | No      | 0.01  | 10         | 199        | 221                   | No      | <0.01 |
|       | 15         | 201      | 221                   | No      | 0.03  | 15         | 203        | 221                   | No      | <0.01 |
|       | 20         | 204      | 221                   | No      | 0.06  | 20         | 206        | 221                   | No      | 0.01  |
|       | 25         | 207      | 221                   | No      | 0.10  | 25         | 209        | 221                   | No      | 0.02  |
|       | 30         | 209      | 221                   | No      | 0.16  | 30         | 211        | 221                   | No      | 0.05  |
|       | 35         | 211      | 221                   | No      | 0.22  | 35         | 213        | 221                   | No      | 0.10  |
|       | 40         | 213      | 221                   | No      | 0.26  | 40         | 215        | 221                   | No      | 0.18  |
|       | 45         | 215      | 221                   | No      | 0.35  | 45         | 217        | 221                   | No      | 0.29  |
|       | 50         | 217      | 221                   | No      | 0.45  | 50         | 219        | 221                   | No      | 0.43  |
|       | 55         | 219      | 221                   | Yes     | 0.55  | 55         | 221        | 221                   | Yes     | 0.57  |
|       | 60         | 221      | 221                   | Yes     | 0.60  | 60         | 223        | 221                   | Yes     | 0.71  |
|       | 65         | 223      | 221                   | Yes     | 0.69  | 65         | 225        | 221                   | Yes     | 0.82  |
|       | 70         | 225      | 221                   | Yes     | 0.78  | 70         | 227        | 221                   | Yes     | 0.90  |
|       | 75         | 228      | 221                   | Yes     | 0.84  | 75         | 229        | 221                   | Yes     | 0.95  |
|       | 80         | 230      | 221                   | Yes     | 0.90  | 80         | 232        | 221                   | Yes     | 0.98  |
|       | 85         | 234      | 221                   | Yes     | 0.96  | 85         | 235        | 221                   | Yes     | 0.99  |
| 90    | 237        | 221      | Yes                   | 0.98    | 90    | 239        | 221        | Yes                   | >0.99   |       |
| 95    | 243        | 221      | Yes                   | >0.99   | 95    | 244        | 221        | Yes                   | >0.99   |       |

Note. %ile=percentile

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

| 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      | 200                   | No      | <0.01 | 5          | 176        | 200                   | No      | <0.01 |
|       | 10         | 174      | 200                   | No      | 0.03  | 10         | 181        | 200                   | No      | <0.01 |
|       | 15         | 177      | 200                   | No      | 0.08  | 15         | 184        | 200                   | No      | 0.02  |
|       | 20         | 179      | 200                   | No      | 0.14  | 20         | 187        | 200                   | No      | 0.05  |
|       | 25         | 182      | 200                   | No      | 0.27  | 25         | 189        | 200                   | No      | 0.10  |
|       | 30         | 184      | 200                   | No      | 0.32  | 30         | 191        | 200                   | No      | 0.20  |
|       | 35         | 185      | 200                   | No      | 0.38  | 35         | 193        | 200                   | No      | 0.34  |
|       | 40         | 187      | 200                   | Yes     | 0.50  | 40         | 195        | 200                   | Yes     | 0.50  |
|       | 45         | 189      | 200                   | Yes     | 0.62  | 45         | 197        | 200                   | Yes     | 0.66  |
|       | 50         | 190      | 200                   | Yes     | 0.68  | 50         | 198        | 200                   | Yes     | 0.74  |
|       | 55         | 192      | 200                   | Yes     | 0.78  | 55         | 200        | 200                   | Yes     | 0.86  |
|       | 60         | 194      | 200                   | Yes     | 0.86  | 60         | 202        | 200                   | Yes     | 0.93  |
|       | 65         | 195      | 200                   | Yes     | 0.89  | 65         | 203        | 200                   | Yes     | 0.95  |
|       | 70         | 197      | 200                   | Yes     | 0.94  | 70         | 205        | 200                   | Yes     | 0.98  |
|       | 75         | 199      | 200                   | Yes     | 0.96  | 75         | 207        | 200                   | Yes     | 0.99  |
|       | 80         | 201      | 200                   | Yes     | 0.98  | 80         | 209        | 200                   | Yes     | >0.99 |
|       | 85         | 204      | 200                   | Yes     | 0.99  | 85         | 212        | 200                   | Yes     | >0.99 |
| 90    | 207        | 200      | Yes                   | >0.99   | 90    | 215        | 200        | Yes                   | >0.99   |       |
| 95    | 212        | 200      | Yes                   | >0.99   | 95    | 220        | 200        | Yes                   | >0.99   |       |
| 4     | 5          | 179      | 213                   | No      | <0.01 | 5          | 185        | 213                   | No      | <0.01 |
|       | 10         | 184      | 213                   | No      | <0.01 | 10         | 190        | 213                   | No      | <0.01 |
|       | 15         | 188      | 213                   | No      | 0.02  | 15         | 194        | 213                   | No      | <0.01 |
|       | 20         | 190      | 213                   | No      | 0.04  | 20         | 197        | 213                   | No      | 0.01  |
|       | 25         | 193      | 213                   | No      | 0.11  | 25         | 199        | 213                   | No      | 0.03  |
|       | 30         | 195      | 213                   | No      | 0.17  | 30         | 201        | 213                   | No      | 0.07  |
|       | 35         | 197      | 213                   | No      | 0.27  | 35         | 203        | 213                   | No      | 0.14  |
|       | 40         | 198      | 213                   | No      | 0.32  | 40         | 205        | 213                   | No      | 0.26  |
|       | 45         | 200      | 213                   | No      | 0.44  | 45         | 207        | 213                   | No      | 0.42  |
|       | 50         | 202      | 213                   | Yes     | 0.56  | 50         | 209        | 213                   | Yes     | 0.58  |
|       | 55         | 204      | 213                   | Yes     | 0.68  | 55         | 211        | 213                   | Yes     | 0.74  |
|       | 60         | 205      | 213                   | Yes     | 0.68  | 60         | 212        | 213                   | Yes     | 0.80  |
|       | 65         | 207      | 213                   | Yes     | 0.78  | 65         | 214        | 213                   | Yes     | 0.90  |
|       | 70         | 209      | 213                   | Yes     | 0.86  | 70         | 216        | 213                   | Yes     | 0.95  |
|       | 75         | 211      | 213                   | Yes     | 0.92  | 75         | 218        | 213                   | Yes     | 0.98  |
|       | 80         | 214      | 213                   | Yes     | 0.97  | 80         | 221        | 213                   | Yes     | >0.99 |
|       | 85         | 216      | 213                   | Yes     | 0.99  | 85         | 223        | 213                   | Yes     | >0.99 |
| 90    | 220        | 213      | Yes                   | >0.99   | 90    | 227        | 213        | Yes                   | >0.99   |       |
| 95    | 225        | 213      | Yes                   | >0.99   | 95    | 232        | 213        | 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      | 222                   | No      | <0.01 | 5          | 192        | 222                   | No      | <0.01 |
|       | 10         | 193      | 222                   | No      | <0.01 | 10         | 198        | 222                   | No      | <0.01 |
|       | 15         | 196      | 222                   | No      | 0.01  | 15         | 201        | 222                   | No      | <0.01 |
|       | 20         | 199      | 222                   | No      | 0.03  | 20         | 204        | 222                   | No      | <0.01 |
|       | 25         | 202      | 222                   | No      | 0.07  | 25         | 207        | 222                   | No      | 0.01  |
|       | 30         | 204      | 222                   | No      | 0.12  | 30         | 209        | 222                   | No      | 0.03  |
|       | 35         | 206      | 222                   | No      | 0.19  | 35         | 211        | 222                   | No      | 0.07  |
|       | 40         | 208      | 222                   | No      | 0.28  | 40         | 213        | 222                   | No      | 0.15  |
|       | 45         | 210      | 222                   | No      | 0.38  | 45         | 215        | 222                   | No      | 0.27  |
|       | 50         | 211      | 222                   | No      | 0.44  | 50         | 217        | 222                   | No      | 0.42  |
|       | 55         | 213      | 222                   | Yes     | 0.56  | 55         | 219        | 222                   | Yes     | 0.58  |
|       | 60         | 215      | 222                   | Yes     | 0.67  | 60         | 221        | 222                   | Yes     | 0.73  |
|       | 65         | 217      | 222                   | Yes     | 0.77  | 65         | 223        | 222                   | Yes     | 0.85  |
|       | 70         | 219      | 222                   | Yes     | 0.85  | 70         | 225        | 222                   | Yes     | 0.93  |
|       | 75         | 221      | 222                   | Yes     | 0.91  | 75         | 228        | 222                   | Yes     | 0.98  |
|       | 80         | 224      | 222                   | Yes     | 0.96  | 80         | 230        | 222                   | Yes     | 0.99  |
|       | 85         | 227      | 222                   | Yes     | 0.99  | 85         | 233        | 222                   | Yes     | >0.99 |
| 90    | 230        | 222      | Yes                   | >0.99   | 90    | 237        | 222        | Yes                   | >0.99   |       |
| 95    | 236        | 222      | Yes                   | >0.99   | 95    | 242        | 222        | Yes                   | >0.99   |       |
| 6     | 5          | 192      | 228                   | No      | <0.01 | 5          | 196        | 228                   | No      | <0.01 |
|       | 10         | 198      | 228                   | No      | <0.01 | 10         | 202        | 228                   | No      | <0.01 |
|       | 15         | 202      | 228                   | No      | <0.01 | 15         | 205        | 228                   | No      | <0.01 |
|       | 20         | 205      | 228                   | No      | 0.01  | 20         | 209        | 228                   | No      | <0.01 |
|       | 25         | 207      | 228                   | No      | 0.03  | 25         | 211        | 228                   | No      | <0.01 |
|       | 30         | 209      | 228                   | No      | 0.05  | 30         | 214        | 228                   | No      | 0.01  |
|       | 35         | 212      | 228                   | No      | 0.12  | 35         | 216        | 228                   | No      | 0.03  |
|       | 40         | 214      | 228                   | No      | 0.19  | 40         | 218        | 228                   | No      | 0.07  |
|       | 45         | 216      | 228                   | No      | 0.28  | 45         | 220        | 228                   | No      | 0.15  |
|       | 50         | 218      | 228                   | No      | 0.38  | 50         | 222        | 228                   | No      | 0.27  |
|       | 55         | 220      | 228                   | Yes     | 0.50  | 55         | 224        | 228                   | No      | 0.42  |
|       | 60         | 222      | 228                   | Yes     | 0.62  | 60         | 226        | 228                   | Yes     | 0.58  |
|       | 65         | 224      | 228                   | Yes     | 0.72  | 65         | 228        | 228                   | Yes     | 0.73  |
|       | 70         | 226      | 228                   | Yes     | 0.81  | 70         | 230        | 228                   | Yes     | 0.85  |
|       | 75         | 228      | 228                   | Yes     | 0.88  | 75         | 233        | 228                   | Yes     | 0.95  |
|       | 80         | 231      | 228                   | Yes     | 0.95  | 80         | 236        | 228                   | Yes     | 0.99  |
|       | 85         | 234      | 228                   | Yes     | 0.97  | 85         | 239        | 228                   | Yes     | >0.99 |
| 90    | 238        | 228      | Yes                   | 0.99    | 90    | 243        | 228        | Yes                   | >0.99   |       |
| 95    | 243        | 228      | Yes                   | >0.99   | 95    | 248        | 228        | 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      | 233                   | No      | <0.01 | 5          | 198        | 233                   | No      | <0.01 |
|       | 10         | 201      | 233                   | No      | <0.01 | 10         | 204        | 233                   | No      | <0.01 |
|       | 15         | 205      | 233                   | No      | <0.01 | 15         | 208        | 233                   | No      | <0.01 |
|       | 20         | 209      | 233                   | No      | <0.01 | 20         | 212        | 233                   | No      | <0.01 |
|       | 25         | 211      | 233                   | No      | 0.01  | 25         | 215        | 233                   | No      | <0.01 |
|       | 30         | 214      | 233                   | No      | 0.02  | 30         | 217        | 233                   | No      | <0.01 |
|       | 35         | 216      | 233                   | No      | 0.05  | 35         | 220        | 233                   | No      | 0.01  |
|       | 40         | 218      | 233                   | No      | 0.08  | 40         | 222        | 233                   | No      | 0.03  |
|       | 45         | 221      | 233                   | No      | 0.18  | 45         | 224        | 233                   | No      | 0.07  |
|       | 50         | 223      | 233                   | No      | 0.27  | 50         | 226        | 233                   | No      | 0.15  |
|       | 55         | 225      | 233                   | No      | 0.38  | 55         | 228        | 233                   | No      | 0.26  |
|       | 60         | 227      | 233                   | Yes     | 0.50  | 60         | 230        | 233                   | No      | 0.42  |
|       | 65         | 229      | 233                   | Yes     | 0.62  | 65         | 233        | 233                   | Yes     | 0.66  |
|       | 70         | 231      | 233                   | Yes     | 0.73  | 70         | 235        | 233                   | Yes     | 0.80  |
|       | 75         | 234      | 233                   | Yes     | 0.86  | 75         | 238        | 233                   | Yes     | 0.93  |
|       | 80         | 237      | 233                   | Yes     | 0.94  | 80         | 240        | 233                   | Yes     | 0.97  |
|       | 85         | 240      | 233                   | Yes     | 0.98  | 85         | 244        | 233                   | Yes     | >0.99 |
| 90    | 244        | 233      | Yes                   | >0.99   | 90    | 248        | 233        | Yes                   | >0.99   |       |
| 95    | 250        | 233      | Yes                   | >0.99   | 95    | 254        | 233        | Yes                   | >0.99   |       |
| 8     | 5          | 197      | 239                   | No      | <0.01 | 5          | 199        | 239                   | No      | <0.01 |
|       | 10         | 203      | 239                   | No      | <0.01 | 10         | 206        | 239                   | No      | <0.01 |
|       | 15         | 208      | 239                   | No      | <0.01 | 15         | 210        | 239                   | No      | <0.01 |
|       | 20         | 211      | 239                   | No      | <0.01 | 20         | 214        | 239                   | No      | <0.01 |
|       | 25         | 214      | 239                   | No      | <0.01 | 25         | 217        | 239                   | No      | <0.01 |
|       | 30         | 217      | 239                   | No      | 0.01  | 30         | 220        | 239                   | No      | <0.01 |
|       | 35         | 219      | 239                   | No      | 0.02  | 35         | 222        | 239                   | No      | <0.01 |
|       | 40         | 222      | 239                   | No      | 0.06  | 40         | 225        | 239                   | No      | 0.01  |
|       | 45         | 224      | 239                   | No      | 0.10  | 45         | 227        | 239                   | No      | 0.02  |
|       | 50         | 226      | 239                   | No      | 0.15  | 50         | 229        | 239                   | No      | 0.06  |
|       | 55         | 229      | 239                   | No      | 0.26  | 55         | 231        | 239                   | No      | 0.12  |
|       | 60         | 231      | 239                   | No      | 0.35  | 60         | 234        | 239                   | No      | 0.28  |
|       | 65         | 233      | 239                   | No      | 0.45  | 65         | 236        | 239                   | No      | 0.42  |
|       | 70         | 236      | 239                   | Yes     | 0.55  | 70         | 239        | 239                   | Yes     | 0.65  |
|       | 75         | 238      | 239                   | Yes     | 0.65  | 75         | 241        | 239                   | Yes     | 0.79  |
|       | 80         | 241      | 239                   | Yes     | 0.78  | 80         | 245        | 239                   | Yes     | 0.94  |
|       | 85         | 245      | 239                   | Yes     | 0.90  | 85         | 248        | 239                   | Yes     | 0.99  |
| 90    | 249        | 239      | Yes                   | 0.97    | 90    | 253        | 239        | Yes                   | >0.99   |       |
| 95    | 256        | 239      | Yes                   | >0.99   | 95    | 259        | 239        | 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 EOG performance level. By using matched score data from a sample of students from North Carolina, 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 in EOG 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 EOG 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 3 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 EOG performance from other school districts in North Carolina 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 3 school districts in North Carolina. The sample contained matched EOG ELA and MAP reading scores from 34,029 students in Grades 3 to 8 and matched EOG and MAP math scores from 33,974 students in Grades 3 to 8 who completed both EOG and MAP in the spring of 2013.

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 EOG ELA scores range from 0.77 to 0.82, and the correlation coefficients between MAP and EOG math scores range from 0.82 to 0.86. All these correlations indicate a strong relationship between MAP and EOG test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

| Subject         | Grade | N     | <i>r</i> | EOG  |       |     |     | MAP  |       |     |     |
|-----------------|-------|-------|----------|------|-------|-----|-----|------|-------|-----|-----|
|                 |       |       |          | Mean | SD    | Min | Max | Mean | SD    | Min | Max |
| ELA/<br>Reading | 3     | 6,503 | 0.82     | 440  | 9.95  | 410 | 462 | 199  | 14.40 | 144 | 242 |
|                 | 4     | 7,115 | 0.79     | 446  | 9.43  | 417 | 468 | 207  | 13.78 | 143 | 255 |
|                 | 5     | 6,898 | 0.80     | 450  | 9.26  | 423 | 473 | 213  | 13.00 | 152 | 250 |
|                 | 6     | 4,623 | 0.78     | 455  | 9.87  | 416 | 478 | 218  | 13.43 | 152 | 262 |
|                 | 7     | 4,495 | 0.77     | 458  | 9.84  | 425 | 483 | 222  | 13.39 | 142 | 265 |
|                 | 8     | 4,395 | 0.78     | 461  | 10.38 | 422 | 488 | 225  | 14.81 | 152 | 271 |
| Math            | 3     | 6,527 | 0.82     | 450  | 9.29  | 425 | 473 | 202  | 11.40 | 145 | 265 |
|                 | 4     | 7,033 | 0.84     | 450  | 9.17  | 425 | 475 | 215  | 12.43 | 138 | 273 |
|                 | 5     | 6,823 | 0.85     | 450  | 9.31  | 426 | 475 | 223  | 13.87 | 157 | 273 |
|                 | 6     | 4,588 | 0.85     | 452  | 9.60  | 427 | 476 | 228  | 14.45 | 158 | 298 |
|                 | 7     | 4,529 | 0.86     | 452  | 9.54  | 429 | 476 | 234  | 16.00 | 158 | 312 |
|                 | 8     | 4,474 | 0.85     | 452  | 9.82  | 429 | 478 | 238  | 18.18 | 151 | 321 |

## Equipercentile Linking Procedure

The equipercentile procedure (e.g., Kolen & Brennan, 2004) was used to establish the concordance relationship between EOG 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., EOG). 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 EOG 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 EOG tests.

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

|           |                     | EOG Score      |                     |
|-----------|---------------------|----------------|---------------------|
|           |                     | Below EOG cut  | At or Above EOG 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 EOG 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 EOG, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(\text{Achieving Level 3 in spring} | a \text{ RIT score of } x) = 1 - \Phi\left(\frac{x + g - c}{SD}\right) \quad (A2)$$

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

$$Pr(\text{Achieving Level 3 in spring} | a \text{ RIT score of } s \text{ in spring}) = 1 - \Phi\left(\frac{s - c}{SE}\right) \quad (A3)$$

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

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