TECHNICAL APPENDIX

Technical Appendix for the MAP Growth Specialty School National Dashboard

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Introduction

The purpose of this technical appendix is to describe the sample and methods used to create the **MAP Growth Specialty School National Dashboard.** The specialty school types we focus on in this dashboard are U.S. public charter schools and U.S. private schools. Within private schools, we also disaggregate further into the following categories of private schools: (a) Catholic schools, (b) Jewish schools, (c) Lutheran schools, (d) Islamic schools, (e) Seventh-day Adventists, (f) other religious schools, and (g) non-religious schools.

Information is provided for each specialty school group on the following metrics: (1) current year average RIT scores by subject and grade (updated seasonally), (2) current year achievement percentiles (relative to the national 2025 NWEA MAP Growth Norms), and (3) conditional growth percentiles (also relative to the 2025 norms). When possible, these data are also further disaggregated by student and school characteristics (i.e., race/ethnicity, gender, and locale). The dashboard data are presented in two different tabs that focus on the following areas:

1) **National Trends** – overall within-year achievement and growth in Math and Reading by specialty school type
2) **Group Insights** – comparison of subgroup performance within each specialty school type

This technical appendix provides documentation of the dashboard's design, including:

- Data sources
- Sample characteristics
- Definitions of key metrics (e.g., achievement percentiles, conditional growth percentiles)
- Page-specific calculations

Data Sources

Measure of Achievement

The data included in the dashboard are drawn from the NWEA anonymized longitudinal student achievement database. School districts use NWEA® MAP® Growth™ assessments to monitor elementary and secondary students' reading and math achievement and gains, with assessments typically administered in the fall (usually between August and November), winter (usually December to March), and spring (late March through June).

MAP Growth is a computer adaptive test that precisely measures achievement, even for students above or below grade level, and is vertically scaled to allow for the estimation of gains across time. MAP Growth assessments are also aligned to state content standards. Test scores are reported on the RIT (Rasch unIT) scale, which is a linear transformation of the logit scale units from the Rasch item response theory model. For more details on the MAP Growth assessment, see the MAP Growth Technical Report.

The NWEA data include student race/ethnicity and gender provided by schools when they roster their students.

Changes to MAP Growth during the study period

In the 2023-24 school year, NWEA began the phased implementation of an enhanced item-selection algorithm for the MAP Growth assessment. This update more closely aligns the assessment with grade-level content to enhance its content validity. The enhanced item-selection algorithm (EISA) prioritizes grade-level content while still adapting to off-grade items where necessary to provide items of appropriate difficulty for students. Nineteen states implemented MAP with EISA in the 2023-24 school year. NWEA conducted a comparability study of the scores with traditional MAP Growth and MAP with EISA and found that prioritization of grade-level test content appears to make the test more sensitive to instruction in math. As a result, fall-spring growth appears to be larger on the new version of the test in math. To account for the differences in test version, we concorded the legacy MAP Growth scores to be on the MAP with EISA math scale. For more detail on the score concordance process, please see NWEA's EISA documentation.

Common Core of Data – Public Elementary/Secondary School Universe Survey Data

For our sample of public charter schools, we collected school characteristic information from the 2023-24 Public Elementary/Secondary School Universe Survey Data files collected by Common Core of Data (CCD) within the National Center for Education Statistics (NCES). Schools in this data file were restricted to charter schools through the CHARTER_TEXT variable. We disaggregated charter school data based on the urbanicity (LOCALE) and the proportion of students eligible for free and reduced lunch (FRPL) variables.[1] We examined four urbanicity levels: (a) rural, (b) suburban, (c) urban, and (d) town. School poverty consisted of three levels: (a) low-poverty schools had less than or equal to 25% FRPL eligibility, (b) mid-poverty schools had greater than 25% and less than or equal to 75% FRPL eligibility, and (c) high-poverty schools had greater than 75% FRPL eligibility.

The NCES created a school-level variable for urbanicity that defines a geographic locale as urban, suburban, town, or rural. A school is in a rural or non-rural area based on U.S. Census definition of a rural area where rural refers to an area with a housing density less than 425 housing units per square mile. Non-rural areas are further divided into urban, suburban, and town areas. Urban refers to a non-rural territory with a population of 50,000 or more inside a principal city. Suburban refers to a non-rural territory with a population of 50,000 or more outside of a principal city. A town refers to a non-rural area with a population of less than 50,000.

Common Core of Data – Private School Survey

For our sample of private schools, we collected school characteristic information from the 2021-22 school-level Private School Universe Survey files (also collected by CCD/NCES). These data are based on the universe of all schools that do not receive public funds and have one or more teachers. Home schooling and homeschooling support organizations are not included in this universe. These data are based on a questionnaire filled out by a school administrator every other year. The questionnaire consists of questions about enrollment by grade, race/ethnicity of the students, number of teachers, program emphasis, religious affiliation, association membership,

[1] For more detail on each variable, see the NWEA technical manual for public school dashboard .

number of high school graduates, and the length of the school year and school day. These data also include information on urbanicity, but they do not provide data on FRPL eligibility thus it is not possible to disaggregate private schools by this variable in the dashboard.

We used the ORIENT variable, which provides a detailed religious and nonsectarian classification of private schools, to classify private schools into seven categories: (a) Catholic schools, (b) Jewish schools, (c) Lutheran schools, (d) Islamic schools, (e) Seventh-day Adventists, (f) other religious schools, and (g) non-religious schools. Table 1 shows the classification of schools based on the options available within the ORIENT variable.

Sample Characteristics

Sample Description

NWEA's MAP Growth tests are non-mandatory assessments that districts opt into administering. Therefore, the samples of schools used in the dashboard are not inherently a representative sample of any category (charter or private school grouping) of U.S. schools. Table 2 at the end of this technical appendix provides a description of the sample of charter and private schools included in the **National Trends** tab relative to the total population of schools within each school category. With respect to charter schools (Table 2A), the NWEA sample has a higher slightly average percentage of Black students (32% to 26%) and a higher percentage of urban schools (39% to 35%) compared to the national sample of charter schools. With respect to private schools, the NWEA sample schools are similar to the national population with respect race/ethnicity, but the NWEA sample has a slightly higher percentage of urban (39% vs. 35%) and rural schools (11% vs 9%) compared to the national average (see Table 2B). [2]

Key Metrics

Below we describe the methods used to calculate average RIT scores, achievement percentiles, conditional growth percentiles.

Reported Metrics

RIT Scores. Student test scores from the NWEA MAP Growth reading and math assessments, called RIT scores, were used in this study. RIT scores range from 100 to 350. Average RIT score are presented within a grade/term/subject.

Achievement Percentile. The achievement percentile is an estimate of the relative ranking of a student's RIT score within a given term and grade compared to the national 2025 NWEA MAP Growth Norms. Since MAP Growth can be administered at any point during the school year, the MAP Growth achievement norms condition on each student's grade, subject, and instructional week of testing (i.e., the week in the school calendar in which a student tested). Instructional weeks were calculated for each student based on their school start date and the individual

[2] We present unweighted descriptive statistics for the sample and population of private schools.

student's testing dates (for more details on the calculation of instructional weeks, see the norms study).

Within each grade and subject, let Y_{it} be a student *i*'s RIT score at instructional week *t*. The predicted mean ($\hat{Y}_t$) and standard deviation ($SD(Y_t)$) for a given grade/subject/instructional week combination were pre-calculated based on the NWEA norms model (see 2025 MAP Growth Norms Technical Manual). Based on these values, we calculated a standardized estimate of the student's RIT score:

$$z(Y_{it}) = \frac{(Y_{it} - \hat{Y}_t)}{SD(Y_t)}. \quad \text{(Equation 1)}$$

From the standardized score, we calculated the score percentile (e.g., the proportion of the distribution with scores less than or equal to the student's score):

$$ps(Y_{it}) = Pr(Y_{it} \leq y_t) = \int_{-\infty}^{y_t} \phi(z)dz, \quad \text{(Equation 2)}$$

where $\phi(z)$ represents the probability density function. The student normative percentile used in this study was scaled to range from 1 to 99:

$$\text{Perc} = 100 \times p_s(Y_{it}). \quad \text{(Equation 3)}$$

Conditional Growth Percentile. The Conditional Growth Percentile, or CGP, is a student's percentile rank for growth. If a student's CGP is 50, this means that the student's growth was greater than or equal to 50 percent of similar students in the NWEA norm group. Students are similar with regard to starting achievement level, grade, subject area, and number of instructional weeks between test events.[3]

The CGP is calculated by first calculating the projected growth based on a student's starting RIT score at a given number of instructional weeks for a grade for a given subject. [4] Next a z-score is calculated based on (observed growth - predicted growth)/standard deviation of growth. Next that z-score is converted into a percentile using an inverse normal function (see equations 2 and 3 above).

Tab-Specific Descriptions

The **National Trends** tab provides a snapshot of student achievement (RIT scores and achievement percentiles) and growth (CGP) within each category of specialty schools within an academic year. This page is designed to offer a high-level view of national patterns, with data updated throughout the year to reflect fall, winter, and spring results as they become available. National results are presented by grade and subject.

[4] https://connection.nwea.org/s/article/Conditional-Growth-Percentile?language=en_US

The **Group Insights** tab examines differences single-year achievement (RIT scores and achievement percentiles) and growth (CGP) across student groups (race/ethnicity, gender, school poverty levels, and urbanicity) compared to national overall trends.

Table 1

Private School Classification based on ORIENT variable in the Private School Survey (PSS)

PSS Category	Catholic	Jewish	Lutheran	Islamic	Seventh-day Adventist	Other Religious	Non-religious
Roman Catholic	X						
Jewish		X					
Lutheran Church - Missouri Synod			X				
Evangelical Lutheran Church in America			X				
Wisconsin Evangelical Lutheran Synod			X				
Other Lutheran			X				
Islamic				X			
Seventh-day Adventist					X		
African Methodist Episcopal						X	
Amish						X	
Assembly of God						X	
Baptist						X	
Brethren						X	
Calvinist						X	
Christian, no specific denomination						X	
Church of Christ						X	
Church of God						X	
Church of God in Christ						X	
Church of the Nazarene						X	
Disciples of Christ						X	
Episcopal						X	
Friends						X	
Greek Orthodox						X	
Latter Day Saints						X	
Mennonite						X	
Methodist						X	
Pentecostal						X	
Presbyterian						X	
Other						X	
Nonsectarian							X

Table 2(A)
Sample School Information Relative to U.S. Population of Charter Schools

Sample	Number of Schools	Average School Enrollment	% FRPL	% White	% Black	% Hispanic	% Asian	Urban	Suburb	Rural	Town
Population of U.S. Charter Schools	6,470	516	63%	29%	26%	35%	4%	55%	27%	12%	6%
NWEA Sample of U.S. Charter Schools	2,247	519	66%	26%	32%	32%	4%	59%	26%	11%	5%

Note: FRPL=free or reduced priced lunch. The source of the variables is the Common Core of Data (CCD) collected by the National Center for Educational Statistics.

Table 2(B)
Sample School Information Relative to U.S. Population of Private Schools

Sample	Category	Number of Schools	Average School Enrollment	% White	% Black	% Hispanic	% Asian	Urban	Suburb	Rural	Town
Population	U.S. Private Schools	22,345	186	52%	11%	10%	5%	35%	38%	9%	18%
NWEA Sample	U.S. Private Schools	4,018	242	54%	12%	11%	5%	39%	37%	11%	13%
Population	Catholic	5,028	291	54%	17%	8%	4%	41%	38%	14%	8%
NWEA Sample	Catholic	1,438	264	56%	14%	9%	3%	39%	37%	16%	8%
Population	Jewish	755	288	83%	2%	2%	1%	53%	45%	0%	2%
NWEA Sample	Jewish	97	347	80%	3%	2%	1%	58%	42%	0%	0%
Population	Lutheran	1,161	154	58%	6%	6%	2%	32%	33%	16%	20%
NWEA Sample	Lutheran	550	167	62%	5%	6%	2%	32%	33%	15%	20%
Population	Islamic	246	184	31%	2%	16%	30%	54%	43%	0%	3%
NWEA Sample	Islamic	97	217	33%	2%	11%	34%	44%	52%	0%	4%
Population	Seventh-day Adventist	578	66	38%	22%	22%	6%	30%	30%	14%	27%
NWEA Sample	Seventh-day Adventist	427	64	39%	22%	23%	5%	32%	31%	13%	24%
Population	Other Religious	7,083	170	60%	8%	11%	3%	25%	31%	9%	34%
NWEA Sample	Other Religious	783	344	52%	12%	15%	4%	36%	41%	7%	16%
Population	Non-religious	7,494	135	41%	9%	10%	6%	38%	46%	5%	12%
NWEA Sample	Non-religious	626	238	54%	8%	11%	7%	47%	38%	4%	11%

Note: The source of the variables is the Common Core of Data (CCD) 2021-22 Private School Survey collected by the National Center for Educational Statistics. Reported estimates are unweighted.