

TECHNICAL BRIEF

Technical appendix for:

Struggling adolescent readers left behind: Evidence of post-COVID-19 declines and pathways forward

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1. Introduction

The purpose of this technical appendix is to share detailed results and more fully describe the sample and methods used in the research included in the brief *Struggling adolescent readers left behind: Evidence of post-COVID-19 declines and pathways forward*. We investigated two main research questions in this brief:

1. How do middle school reading test scores on the MAP Growth assessment change from 2017 to 2025 compared across the 10th, 50th, and 90th percentiles?
2. Do the observed middle school MAP Growth reading declines between 2022 and 2025 for the lowest-performing students replicate across other large-scale assessments?

2. Data

NWEA MAP Growth

The primary data for this study are from the NWEA anonymized longitudinal student achievement database. MAP Growth is a voluntary interim assessment used by school districts to monitor elementary and secondary students' reading and math achievement and gains. 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 nationally weighted sample used in this study is from NWEA's [MAP Growth Dashboard](#). The sample characteristics and weighting procedures used are described in the [Dashboard Technical Appendix](#). In total, the Dashboard results are based on a sample of over 20 million K–8 students in 30,000 schools tested between spring 2017 and spring 2025.

National Assessment of Educational Progress (NAEP)

NAEP (widely known as “The Nation’s Report Card”) is congressionally mandated and run by the National Center for Education Statistics (NCES), part of the U.S. Department of Education. It is the largest continuing, nationally representative assessment measuring what U.S. students know and can do in core subjects like mathematics and reading. It is given every two years to 4th- and 8th-grade students. 8th-grade reading scale scores at the 10th, 50th, and 90th percentiles for 2019, 2022, and 2024 were downloaded from the [NAEP Data Explorer \(NDE\)](#).

Curriculum Associates i-Ready

The final data used in this brief are from Curriculum Associates' i-Ready assessment, as reported in the [State of Student Learning](#) 2025 report. This report examines achievement trends for students in Grades K–8 who took the i-Ready Diagnostic in 2024–25. The **i-Ready Diagnostic** is an adaptive online assessment for grades K–12 that evaluates students' proficiency in reading and math. It adjusts question difficulty based on answers, identifying exact skill gaps and strengths to help teachers personalize instruction. The nationally representative samples included in the report contain 11.8 million students for reading and 13.5 million

students for math. Appendix Table 9 reports the reading scale scores at the 10th, 50th, and 90th percentiles in 2019, 2022, and 2025.

3. Methods

RQ1: How did middle school reading test scores on the MAP Growth assessment change from 2017 to 2025 across the 10th, 50th, and 90th percentiles?

In each grade/year, we calculated the RIT score corresponding to the 10th, 50th, and 90th percentiles of the observed score distribution (i.e., the scores below which 10%, 50%, and 90% of students performed). These estimates are reported in the left half of Table 1 for grades 6–8. To understand trends over time at each percentile level, we used 2019 as a baseline and calculated how much scores in each year differed from the 2019 estimate. With difference estimates centered relative to 2019, the 2019 estimate is 0, and the values for other years represent the number of RIT points above or below the 2019 benchmark (see the right half of Table 1 and Figure 1 in the main brief).

RQ2. Do the observed middle school MAP Growth reading declines between 2022 and 2025 for the lowest-performing students replicate across other large-scale assessments?

To compare trends across assessments, we standardized estimates for each assessment. First, we obtained the scale scores associated with the 10th, 50th, and 90th percentiles in 2019, 2022, and 2025 for each available grade/assessment from publicly available reports. Second, we took the difference between 2022 and 2025 at each percentile level for each assessment/grade combination. Finally, we divided each difference score by the 2019 scale score standard deviation for each available grade/assessment. The scale scores and standardized difference scores for each percentile level/grade/assessment are reported in Table 2.

Table 1. Middle school reading trends on MAP Growth from 2017 to 2025 at three percentile levels

Grade	Year	RIT Score			Difference from 2019		
		10th Percentile	50th Percentile	90th Percentile	10th Percentile	50th Percentile	90th Percentile
6	2017	194	217	233	0	0	0
6	2018	194	217	233	0	0	0
6	2019	194	217	233	0	0	0
6	2021	190	215	232	-4	-2	-1
6	2022	191	215	232	-3	-2	-1
6	2023	190	215	232	-4	-2	-1
6	2024	190	215	232	-4	-2	-1
6	2025	189	215	232	-5	-2	-1
7	2017	197	221	237	0	1	0
7	2018	198	221	237	1	1	0
7	2019	197	220	237	0	0	0
7	2021	193	219	236	-4	-1	-1
7	2022	193	218	236	-4	-2	-1
7	2023	193	218	236	-4	-2	-1
7	2024	193	218	235	-4	-2	-2
7	2025	192	218	236	-5	-2	-1
8	2017	201	224	240	1	1	0
8	2018	201	224	240	1	1	0
8	2019	200	223	240	0	0	0
8	2021	196	222	240	-4	-1	0
8	2022	196	221	239	-4	-2	-1
8	2023	196	221	238	-4	-2	-2
8	2024	196	221	238	-4	-2	-2
8	2025	195	221	239	-5	-2	-1

Note. The reported RIT scores represent the scores below which 10%, 50%, and 90% of students performed based on a national sample in each grade/year. See the [Dashboard Technical Appendix](#) for counts within each grade/year.

Table 2. Comparisons across assessments in middle school reading trends

Year	Test	Grade	SD (2019)	Scale Scores			Year change	Standardized Difference Scores		
				10th Percentile	50th Percentile	90th Percentile		10th Percentile	50th Percentile	90th Percentile
2019	i-Ready	6	59	512	591	650				
2022	i-Ready	6	59	509	592	647	2019-22	-0.05	0.02	-0.05
2025	i-Ready	6	59	502	592	649	2022-25	-0.12	0.00	0.03
2019	i-Ready	7	61	521	606	660				
2022	i-Ready	7	61	522	607	661	2019-22	0.02	0.02	0.02
2025	i-Ready	7	61	515	607	662	2022-25	-0.11	0.00	0.02
2019	i-Ready	8	58	532	618	670				
2022	i-Ready	8	58	535	620	672	2019-22	0.05	0.03	0.03
2025	i-Ready	8	58	529	621	673	2022-25	-0.10	0.02	0.02
2019	MAP Growth	6	16	194	217	233				
2022	MAP Growth	6	16	191	215	232	2019-22	-0.19	-0.13	-0.06
2025	MAP Growth	6	16	189	215	232	2022-25	-0.13	0.00	0.00
2019	MAP Growth	7	16	197	220	237				
2022	MAP Growth	7	16	193	218	236	2019-22	-0.25	-0.12	-0.06
2025	MAP Growth	7	16	192	218	236	2022-25	-0.06	0.00	0.00
2019	MAP Growth	8	16	200	223	240				
2022	MAP Growth	8	16	196	221	239	2019-22	-0.25	-0.12	-0.06
2025	MAP Growth	8	16	195	221	239	2022-25	-0.06	0.00	0.00
2019	NAEP	8	38	213	266	309				
2022	NAEP	8	38	209	263	307	2019-22	-0.09	-0.08	-0.05
2024	NAEP	8	38	204	261	307	2022-24	-0.14	-0.05	0.00

Note. See Data section for estimate sources.