COLLABORATIVE FOR STUDENT GROWTH

BRIEF

Student achievement in 2021–2022:
Cause for hope and continued urgency

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KEY FINDINGS

- **Initial signs of academic rebounding were evident in 2021–22, with reading and math achievement gains paralleling pre-pandemic trends in many grades; rebounding appeared stronger in math and among younger students.**
- **There were signs of rebounding across all school poverty levels; however, low-poverty schools have less ground to make up and thus will likely recover faster.**
- **Despite some signs of rebounding, student achievement at the end of the 2021–22 school year remains lower than in a typical year, with larger declines in math (5 to 10 percentile points) than reading (2 to 4 percentile points). Modest improvements are evident among elementary students. Middle school achievement declines appear to be mostly unchanged.**
- **Black, Hispanic, and American Indian/Alaska Native (AIAN) students remain disproportionately impacted.**

School systems started the 2021–22 school year with extra resources and plans for recovery, but repeated resurgences of the COVID-19 virus thwarted hopes of a strong comeback. Schools continued to face a myriad of challenges including severe staff shortages, high rates of absenteeism and sickness, and rolling school closures forced by the pandemic's fallout.

This brief continues NWEA's ongoing research agenda examining how the COVID-19 pandemic has affected student achievement in reading and math. Here, we build on our previous findings[i–iv] to examine students' achievement gains up to the end of the third school year impacted by the pandemic. To understand the cumulative impact of the pandemic on student achievement and look for initial signs of rebounding, we used test score data from 8.3 million students in grades 3–8 who took MAP® Growth™ assessments in reading and math in approximately 25,000 public schools between 2018–19 and 2021–22. We compared these data to a sample of students of a roughly comparable size who tested between 2015–16 and 2018–19.

Terminology

Achievement gains: Changes in students' test scores between the fall and spring.

Achievement gap: To quantify unfinished learning due to the pandemic, we compare outcomes for a COVID sample and a pre-COVID sample. We use the term "achievement gap" to refer to differences between these samples in a grade level, reported as standardized differences in average test scores and as declines in achievement percentiles.

Rebounding: Patterns of achievement gains that mirror or exceed pre-pandemic trends. "Rebounding" is not interchangeable with "recovery," but rather the former describes progress towards the latter.

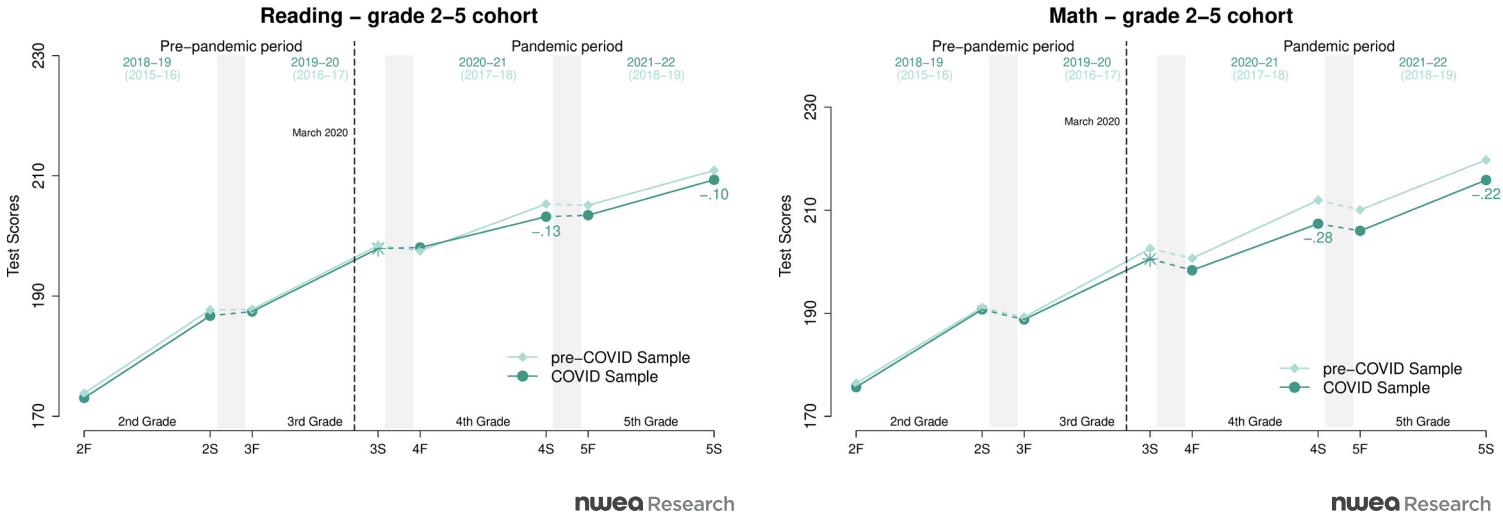
Recovery: We define recovery as—at minimum—reaching equivalence with pre-pandemic achievement levels. However, we note that significant educational inequities predate the pandemic, and a goal of returning to a pre-pandemic status quo will be insufficient to ameliorate these inequities.

Achievement gains during the 2021–22 school year showed evidence of rebounding

To look for initial signs of rebounding, we examined students' achievement gains across the pandemic-affected school years (following cohorts of students from 2018–19 to 2021–22)[1] and compared gains for this "COVID sample" against the achievement gains for a "pre-COVID sample." The pre-COVID sample was observed during pre-pandemic school years (from 2015–16 to 2018–19) and represents typical achievement gains that may have been expected if COVID-19 had not occurred.

Figure 1 compares average fall and spring achievement (shown as points) as well as the gains during each school year and summer (solid and dashed lines respectively that connect the points) over a four-year period for the COVID sample relative to the pre-COVID sample. For simplicity, Figure 1 depicts these average gains across years for one cohort of students (those who were second graders in 2018–19 and fifth graders by 2021–22).[2] Consistent with our prior research,[ii] the pandemic resulted in diminished achievement gains during the 2020–21 school year relative to pre-pandemic trends (i.e., the light and dark green lines fan out in that year). In contrast, patterns in 2021–22 show some encouraging evidence of rebounding. The gains made during the 2021–22 school year are at least parallel to the pre-pandemic sample, and in some cases actually steeper. This indicates that the rate of gains this year was more consistent with pre-pandemic trends. As a result, the gap between average achievement for the COVID sample and the pre-COVID sample has either held steady or slightly diminished in the last school year.

Figure 1. Average MAP Growth achievement across four school years for grade 2–5 cohort in reading (left panel) and math (right panel)



Note: Test score means within each term of the COVID sample (2018–19 to 2021–22 school years) are plotted in dark green, while the pre-pandemic reference line (light green) displays the means of the pre-COVID sample (students in the same grade span during the 2015–16 to 2018–19 school years). Spring 2020 data is asterisked because it is based on approximately 5% of the students relative to other terms due to the testing interruptions during COVID school closures. Standardized mean differences between the groups for spring 2021 and spring 2022 are shown below the COVID sample line, with negative values indicating that achievement for the COVID sample was lower than the pre-COVID sample. For the other grade combinations as well as more details on the calculation and sensitivity to sample inclusion rules, see the technical appendix.[v]

[1] The inclusion of a pre-pandemic year (2018–19) for the COVID sample is important in order to establish baseline equivalence between the COVID and pre-COVID samples. Comparing students in this baseline school year (2018–19 for the COVID sample; 2015–16 for the pre-COVID sample) allows us to be more confident that any differences observed during the pandemic cannot be explained by pre-existing differences between the two samples.

[2] Results for non-depicted cohorts are consistent with trends depicted in Figure 1 and are available in the technical appendix[v] that accompanies this report.

The numbers reported below the dark green circles in Figure 1 reflect the achievement gap between the COVID sample and the pre-COVID sample calculated as standardized mean differences within a term.[3] Estimates are reported in standard deviation (SD) units based on the pooled SD across the two samples in a given grade/term. Table 1 summarizes these SD differences for all six cohorts and shows the change in the gaps between spring 2021 and spring 2022. Positive changes indicate signs of rebounding (i.e., the differences between average test scores for the COVID sample and the pre-COVID sample are closing). Overall, Table 1 shows that achievement gaps between pre-pandemic and pandemic test scores are shrinking, although more so for younger students and in math.

In our prior research, we have consistently found that the pandemic has had larger negative impacts on math achievement compared to reading achievement. Thus, it is important to contextualize the absolute magnitude of the change in gaps relative to the initial size of the gaps. To do this, we also calculated the change in gaps proportional to the size of the gaps in spring 2021. For example, for the grade 2–5 cohort, the gap in math achievement we observed in spring 2021 (-0.28 SD units) has shrunk by 0.06 SD units by spring 2022 (-0.22 SD units), and this is a 23% decrease. The gap in reading achievement we observed in spring 2021 for this cohort (-0.13 SD units) has shrunk by 0.03 SD units by spring 2022 (-0.10 SD units), and this is a 25% decrease. Notice that the percent of change is similar across subjects for this cohort even though the absolute magnitude of the change is twice as large in math compared to reading. This is because there is less ground to make up in reading.

Finally, Table 1 also gives rough estimates of the years required to fully close achievement gaps if the rate of change stayed the same. The number of years needed to close the gap is calculated by dividing the gap in spring 2022 by the change in gap over the last year. Given the potential imprecision in these estimates, we report the years needed to close gaps as ranges (1–2 years, 3–5 years, or 5+ years). If the rate of change we observe this year continues, we can expect that it will take the average elementary school student at least three years to fully recover. For older students, it will take far longer. Notably, in most cases these recovery timelines extend past spending deadlines for federal recovery funds, and for some students, full recovery would not be attainable before the end of high school.

Table 1. Difference in achievement gaps between spring 2021 and spring 2022 in reading and math by cohort

		Achievement gap by spring 2021		Achievement gap by spring 2022				
Subject	Cohort	Grade	Gap	Grade	Gap	Change in gap	% Change	Years to close gap
Reading	K–3	2	-0.14	3	-0.12	0.02	16%	5+
	1–4	3	-0.14	4	-0.09	0.05	36%	1–2
	2–5	4	-0.13	5	-0.10	0.03	25%	3–5
	3–6	5	-0.13	6	-0.10	0.03	24%	3–5
	4–7	6	-0.12	7	-0.12	0.01	4%	5+
	5–8	7	-0.13	8	-0.12	0.01	8%	5+
Math	K–3	2	-0.22	3	-0.18	0.04	18%	3–5
	1–4	3	-0.26	4	-0.19	0.07	27%	3–5
	2–5	4	-0.28	5	-0.22	0.06	23%	3–5
	3–6	5	-0.27	6	-0.19	0.08	31%	1–2
	4–7	6	-0.21	7	-0.21	0.00	0%	5+
	5–8	7	-0.20	8	-0.24	-0.04	-18%	5+

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Note: The achievement gaps reported in this table are the standardized difference between the pre-COVID and COVID samples in a given grade/term. The percent change in gaps was calculated with unrounded achievement gaps, and as a result, the estimates may not match calculations with the rounded numbers that appear in the table. Years needed to close the gaps (assuming current rates of closure) were calculated by dividing the gap in spring 2022 by the rate of change in the gaps across the last year. Given the potential imprecision in these estimates, we binned the years needed to close gaps into three categories (1–2 years, 3–5 years, or 5+ years).

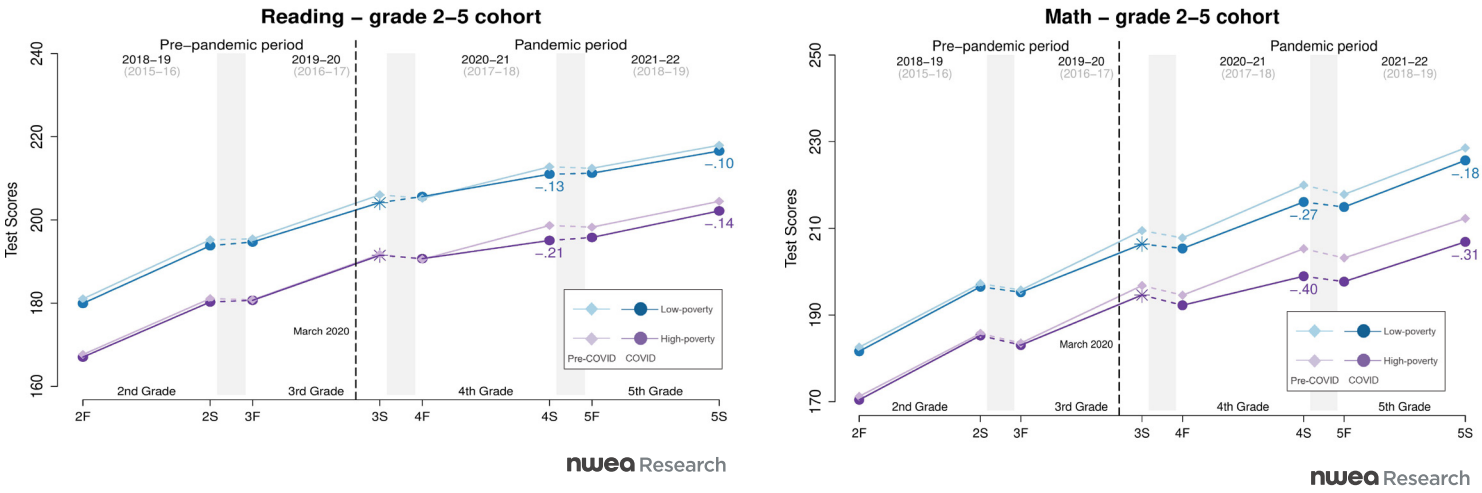
[3] As a point of reference, the math standardized gaps reported in Figure 1 (and Table 1) are significantly larger than estimated impacts from other large-scale school disruptions, such as when math scores dropped 0.17 SDs in the year following Hurricane Katrina.[vi] For further information on understanding the magnitude of COVID gaps relative to typical educational interventions, see a recent Brookings blog[vii] and work by Matthew Kraft.[viii]

We see evidence of rebounding achievement gains in 2021–22 across school poverty levels; however, achievement gaps in high-poverty schools remain larger than those in low-poverty schools

Our prior research has consistently shown that the impact of the pandemic has been uneven for students according to school poverty level, with students in high-poverty schools showing more substantial drops in test scores during the pandemic.[ii,ix] To understand if these differential trends extended into 2021–22, we disaggregated our results by school poverty level to examine whether we observed differential rebounding between low- and high-poverty schools.[4]

Figure 2 displays four years of test score data for the COVID and pre-COVID samples separately for students in low- and high-poverty schools for one cohort of students (second graders in 2018–19 who were fifth graders in 2021–22).[5] Figure 2 shows that students in high-poverty schools fell further behind during the 2020–21 school year (indicated by greater divergence between the pre-COVID sample and the COVID sample within high-poverty schools compared to low-poverty schools), which widened the pre-existing disparities between low- and high-poverty schools. In 2021–22, we see evidence of achievement gains rebounding to be parallel to pre-pandemic trends in both low- and high-poverty schools. However, even with these positive signals of rebounding, we still find evidence of significant gaps between current and pre-pandemic achievement and the size of those gaps is larger in high-poverty schools. As a result, students in low-poverty schools have less ground to make up and are thus more likely to make a swifter recovery.

Figure 2. Average MAP Growth achievement for grade 2–5 cohort by school poverty level in reading (left panel) and math (right panel)



Note: Average test scores for low-poverty schools are shown in blue, while high-poverty school means are shown in purple. The lighter shade represents the pre-COVID sample and the darker shade represents the COVID sample. "Low poverty" is defined as less than 25% free or reduced priced lunch (FRPL) eligibility, while "high poverty" is greater than 75% FRPL eligibility. Spring 2020 means are asterisked because they are based on approximately 5% of the students relative to other terms due to the testing interruptions during COVID school closures. Standardized mean differences between the COVID and pre-COVID sample within school poverty level are shown below each of the COVID sample lines, with negative values indicating that the COVID sample scored lower than the pre-COVID sample. The plots for other grade cohorts are available in the technical appendix.[v]

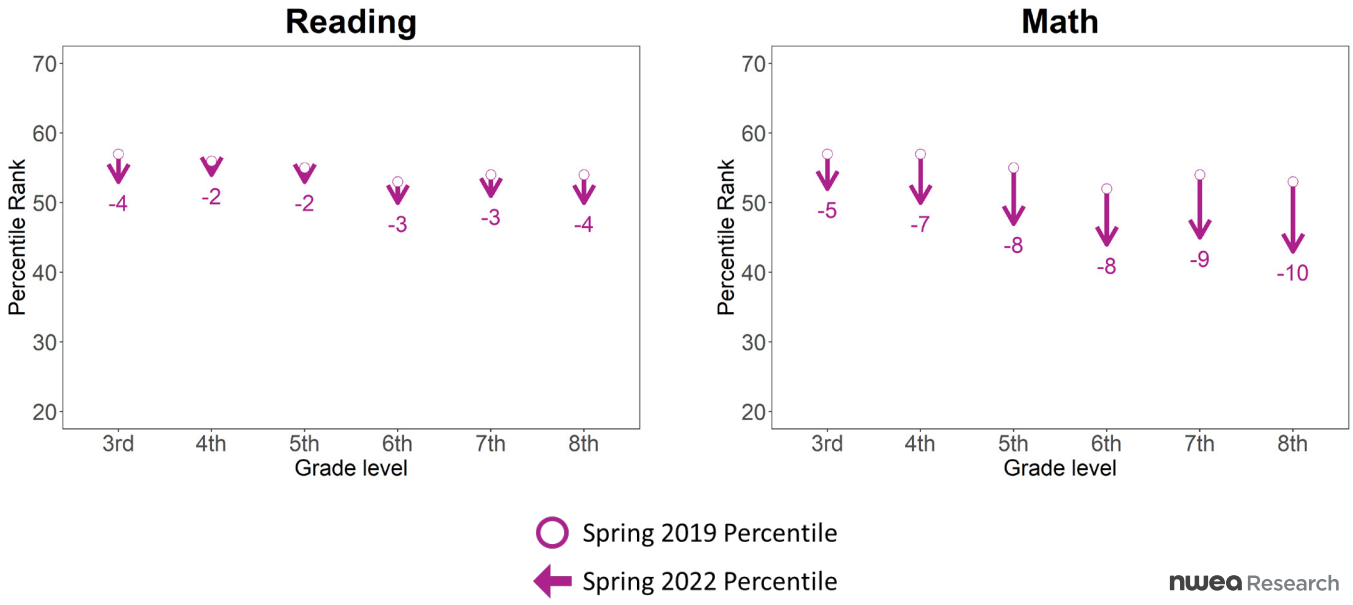
[4] "Low poverty" is defined as less than 25% free or reduced priced lunch (FRPL) eligibility while "high poverty" is greater than 75% FRPL eligibility. School poverty data comes from the 2019–20 Common Core of Data files released by the National Center for Education Statistics.[x]

[5] Results for non-depicted cohorts are consistent with trends depicted in Figure 2 and are available in the technical appendix[v] that accompanies this report.

Spring 2022 math and reading achievement levels continue to lag historical averages (particularly in math); however, elementary students have shown encouraging progress

The prior section quantifies achievement gaps in terms of standardized mean differences in test scores for the pre-COVID sample compared to the COVID sample. In keeping with our prior research, we also quantify achievement gaps by examining differences in achievement percentiles over time, given that this metric is more commonly used in schools. Here, we focus on end-of-year achievement percentiles to provide information that may be useful for planning what to expect when students return to the classroom in fall 2022. We calculated the median percentile rank (based on NWEA 2020 MAP Growth norms[xi]) of students in spring 2022 (COVID sample) and spring 2019 (pre-COVID sample), as well as the decline over time, which captures the difference in median percentile rank between these two groups. As shown in Figure 3, we observed declines in spring 2022 achievement relative to spring 2019 ranging in magnitude from 2 to 4 percentile points in reading and 5 to 10 percentile points in math. These declines represent an improvement over what we observed in spring 2021 (i.e., the declines are smaller in magnitude), particularly in elementary grades.[6]

Figure 3. MAP Growth percentile rank differences between same-grade students in spring 2019 (circles) and students in spring 2022 (arrows) in reading (left panel) and math (right panel)



Note: The circles represent the median percentile rank for the pre-COVID (spring 2019) sample; the arrow tip represents the median percentile rank for the COVID (spring 2022) sample; and the value outside the arrow indicates the change in median percentile rank between spring 2019 and spring 2022.

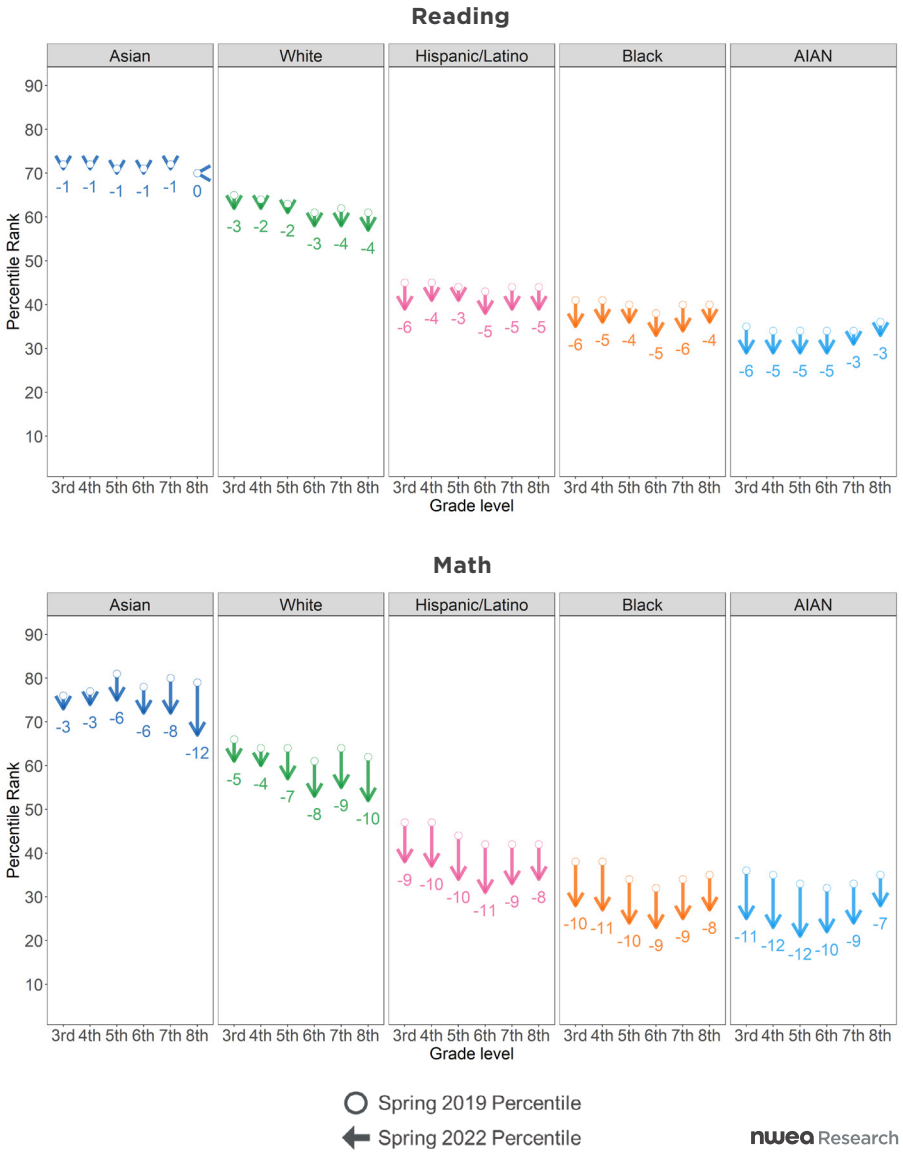
[6] Our published reports use the shifting samples of schools and students who take MAP Growth over time (depending on the number of schools and students testing across terms). Therefore, previous reports reflect slightly different testing populations, and comparisons across reports should be made with some caution.

Historically marginalized students continue to be the most affected by the pandemic

Figure 4 shows differences in percentile rank between spring 2022 and spring 2019 disaggregated by student grade and race/ethnicity. This allows us, for example, to situate reading achievement for Black third graders in spring 2022 (where median achievement is at the 35th percentile) relative to the reading achievement of Black third graders in spring 2019 (where median achievement was at the 41st percentile) and calculate the difference between the two groups (in this case, a decline of 6 percentile points).

Figure 4 illustrates that median achievement declined for nearly all groups in reading and math, although the declines are larger in math. However, the pattern of these differences is uneven across student groups. Specifically, Asian American and white students showed declines of a smaller magnitude relative to Hispanic, Black, and AIAN students. These differences in declines by race/ethnic group are most evident in elementary grades. Declines are more similar among middle grades. When comparing the size of the achievement declines in spring 2022 against those we reported in spring 2021,[ii] we consistently see the largest improvements for students in the elementary grades across racial/ethnic groups.

Figure 4. MAP Growth percentile rank change by race/ethnicity in reading (top panel) and math (bottom panel)



Note: AIAN = American Indian or Alaska Native. The circles represent the median percentile rank for the pre-COVID (spring 2019) sample; the arrow tip represents the median percentile rank for the COVID (spring 2022) sample; and the value outside the arrow indicates the change in median percentile rank between spring 2019 and spring 2022. Tables 6A and 6B in the technical appendix[v] report the median percentiles and standardized mean differences by racial/ethnic group and cohort.

Summary

Examining students' average test scores over the COVID period shows that achievement gains during the 2021–22 school year more closely parallel (and in some cases slightly exceed) average pre-pandemic achievement gains. Rebounding appears stronger in math compared to reading and in younger students compared to older students. Our previous research has consistently shown that younger students and math achievement have been hit the hardest, so these improvements are encouraging.

It is also heartening that achievement gains are rebounding to be more consistent with pre-pandemic trends across school poverty levels. However, our prior research has consistently shown that the pandemic has more strongly impacted students in high-poverty schools and, that as a result, these students have more ground to regain. If current trends hold, we can expect students in low-poverty schools to recover more swiftly.

Despite there being evidence of rebounding in many areas, we also found continued evidence of significant gaps between achievement in spring 2022 relative to pre-pandemic averages. These gaps are somewhat smaller than what we have reported in previous research, but still will require several years at minimum to return to pre-pandemic achievement levels. Further, we continue to find uneven impacts of the pandemic across racial/ethnic groups with the largest achievement declines still apparent for Hispanic, Black, and AIAN students. While we see some evidence of rebounding for the students who have been the hardest hit, achievement disparities remain wider in spring 2022 than prior to the start of the pandemic. In total, while there are some signs of hope, our overall findings point to a long road to recovery still ahead.

Call to action

These results offer some signs of hope while simultaneously underscoring the sustained need for urgency in responding to the COVID-19 crisis. Rates of fall–spring achievement gains during 2021–22 rebounded to parallel pre-pandemic growth trends. This faster pace of growth compared to 2020–21 is especially encouraging given that schools continued to face significant challenges in 2021–22. However, we must temper our celebration as significant gaps between current and historic achievement levels still exist, and especially so for students of color and students attending high-poverty schools. If achievement gains remain parallel with pre-pandemic trends in the coming school year, these gaps will also persist.

Furthermore, educators and policymakers must critically interrogate what constitutes "academic recovery." Setting a goal to restore achievement to pre-pandemic levels will do nothing to address the education inequities that predate the pandemic and have only widened over the last two years. A one-size-fits-all approach to pandemic recovery means that some students will have their needs met while others will continue to be left behind, effectively perpetuating disparities for historically underserved groups. Meeting this moment requires right-sizing resources and intervention efforts so that they are proportional to the needs of schools and students. Truly achieving recovery requires above-average growth—and for some students, that growth will have to be well above average. Otherwise, widened education inequities will be the lasting legacy of this pandemic.

i. Kuhfeld, M., Tarasawa, B., Johnson, A., Ruzek, E., & Lewis, K. (2020). Learning during COVID-19: Initial findings on students' reading and math achievement and growth. NWEA. https://www.nwea.org/content/uploads/2020/11/Collaborative-brief-Learning-during-COVID-19.NOV2020.pdf

ii. Lewis, K., Kuhfeld, M., Ruzek, E., & McEachin, A. (2021). Learning during COVID-19: Reading and math achievement in the 2020–21 school year. NWEA. https://www.nwea.org/content/uploads/2021/07/Learning-during-COVID-19-Reading-and-math-achievement-in-the-2020-2021-school-year.research-brief-1.pdf

iii. Kuhfeld, M., Ruzek, E., Lewis, K., Soland, J., Johnson, A., Tarasawa, B., & Dworkin, L. (2021). Understanding the initial educational impacts of COVID-19 on communities of color. NWEA. https://www.nwea.org/research/publication/understanding-the-initial-educational-impacts-of-covid-19-on-communities-of-color/

iv. Lewis, K., & Kuhfeld, M. (2021). Learning during COVID-19: An update on student achievement and growth at the start of the 2021–22 school year. NWEA. https://www.nwea.org/content/uploads/2021/12/Learning-during-COVID19-An-update-on-student-achievement-and-growth-at-the-start-of-the-2021-2022-school-year-Research-Brief.pdf

v. Kuhfeld, M., & Lewis, K. (2022). Technical appendix, Student achievement in 2021–22: Cause for hope and continued urgency. NWEA. https://www.nwea.org/research/publication/ technical-appendix-for-student-achievement-in-2021-22-cause-for-hope-and-continued-urgency/

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vii. Kuhfeld, M., Soland, J., Lewis, K., and Morton, E. (2022). The pandemic has had devastating impacts on learning. What will it take to help students catch up? Brown Center Chalkboard, The Brookings Institution. https://www.brookings.edu/blog/brown-center-chalkboard/2022/03/03/the-pandemic-has-had-devastating-impacts-on-learning-what-will-it-take-to-help-students-catch-up/

viii. Kraft, Matthew. (2019). Interpreting Effect Sizes of Education Interventions. (EdWorkingPaper: 19-10). Retrieved from Annenberg Institute at Brown University: http://www.edworkingpapers.com/ai19-10

ix. Kuhfeld, M., Soland, J., and Lewis, K. (2022). Test Score Patterns Across Three COVID-19-Impacted School Years. *Educational Researcher.* https://journals.sagepub.com/eprint/BPW2UJUMCV4JQIFH4D8P/full

x. U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), 2019–2020, Public Elementary/ Secondary School Universe Survey Data, (v.1a).

xi. Thum, Y. M., & Kuhfeld, M. (2020). NWEA 2020 MAP Growth Achievement Status and Growth Norms for Students and Schools. NWEA Research Report. Portland, OR: NWEA. https://teach.mapnwea.org/impl/normsResearchStudy.pdf

Details on the methodology behind these analyses can be found in:
Kuhfeld, M., & Lewis, K. (2022). Technical appendix, Student achievement in 2021–22: Cause for hope and continued urgency. NWEA. https://www.nwea.org/research/publication/technical-appendix-for-student-achievement-in-2021-22-cause-for-hope-and-continued-urgency/

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Dr. Megan Kuhfeld is a senior research scientist for the Collaborative for Student Growth at NWEA. Her research seeks to understand students' trajectories of academic and social-emotional learning (SEL) and the school and neighborhood influences that promote optimal growth. Dr. Kuhfeld completed a doctorate in quantitative methods in education and a master's degree in statistics from the University of California, Los Angeles (UCLA).

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ABOUT NWEA

For more than 40 years, NWEA® has been a pioneer in educational research and assessment methodology with a focus on improving learning outcomes for every student. NWEA continues this discovery through dedicated research that explores foundational issues in education, practical challenges in today's schools, and the evolving role of technology in the lives of students. As a mission-based not-for-profit educational research organization, NWEA's research agenda reflects our commitment to attacking big challenges in education and measurement and empowering education stakeholders with actionable insights.

ABOUT THE COLLABORATIVE FOR STUDENT GROWTH

The Collaborative for Student Growth at NWEA is devoted to transforming education research through advancements in assessment, growth measurement, and the availability of longitudinal data. The work of our researchers spans a range of educational measurement and policy issues including achievement gaps, assessment engagement, social-emotional learning, and innovations in how we measure student learning. Core to our mission is partnering with researchers from universities, think tanks, grant-funding agencies, and other stakeholders to expand the insights drawn from our student growth database—one of the most extensive in the world.

ABOUT THE CENTER FOR SCHOOL AND STUDENT PROGRESS

The Center for School and Student Progress (CSSP) engages directly with NWEA partner schools to influence education practices and policies that promote student success. The CSSP focuses on issues that impact the daily work of educators and the students they serve, such as achievement and growth patterns for traditionally underserved students, the integrity of testing systems, supporting college and career readiness, and school accountability. CSSP researchers also serve as consultative partners, offering advanced technical support, custom research projects, and analysis to school leadership, educators, and policymakers.

ABOUT MAP GROWTH

MAP Growth is a computer adaptive test that is vertically scaled across grades K–12 and measures student achievement on the RIT (Rasch unit) scale. Because the RIT scale is an equal-interval, cross-grade scale and the assessment adapts above or below grade level, RIT scores can be used to compare achievement across students and over time—within an academic year and across multiple years. In addition, we use NWEA's nationally representative norms (which were calculated with a pre-pandemic sample of students) to convert RIT scores to percentile rankings, which helps situate student performance relative to academic peers (for example, a third-grade student at the 40th percentile scored at or above 40% of other third graders).

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