RESEARCH & PRACTICE

Approach SY21–22 with a growth mindset

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NWEA® research into student learning during the 2020–21 school year has confirmed what many suspected was true: COVID-19 school closures have exacerbated inequities in education.

As the research brief that follows explains, many children in grades 3–8 made reading and math gains in SY20–21, but they made them at a slower rate than before the pandemic. And while achievement was lower for all student groups, American Indian and Alaska Native, Black, and Latinx students, as well as students in high-poverty schools, were disproportionately impacted.

The future feels daunting, to say the least. We cannot lose hope. All kids continue to have an infinite capacity for learning. The posts by Teach. Learn. Grow. blog authors in this eBook will give you specific reading and math strategies that will help you harness the power of a growth mindset.

Learning during COVID-19: Reading and math achievement in the 2020–21 school year

Karyn Lewis, Megan Kuhfeld, Erik Ruzek, and Andrew McEachin

KEY FINDINGS

- On average, students across most grades (3–8) made reading and math gains in 2020–21.
- However, students' outcomes during the pandemic-affected school year were lower on multiple dimensions:
  - Students made gains during the 2020–21 school year at a lower rate compared to pre-pandemic trends, especially between winter and spring.
  - Students ended the year with lower achievement compared to a typical year, with larger declines relative to historical trends in math (8 to 12 percentile points) than in reading (3 to 6 percentile points).
- Achievement was lower for all student groups in 2020–21; however American Indian and Alaska Native (AIAN), Black, and Latinx students, as well as students in high-poverty schools were disproportionately impacted, particularly in the elementary grades we studied.

At the start of the 2020–21 school year, the COVID-19 pandemic continued to inflict massive disruptions on all aspects of daily life, presenting educators, students, and their families with enormous challenges, even as many schools began to reopen. Although the severity of these challenges varied across schools, districts, and states, the 2020–21 academic year was far from normal for everyone. Thus, a critical question is: to what extent did these disruptions affect students' achievement?

In December of 2020, the NWEA research team released a report[i] summarizing how students fared academically during the early phase of the COVID-19 pandemic, as measured by the NWEA MAP® Growth™ assessment. Our initial findings showed that impacts of the pandemic were concentrated in math: reading achievement in fall of 2020 was consistent with the prior year, but average math achievement was 5 to 10 percentile points lower than the previous fall.[1] We also found that, on average, students made gains during the early phase of the pandemic (between winter of 2020 right before initial school shutdowns and fall of 2020); however, math gains were smaller than pre-pandemic trends.

This brief continues our ongoing research agenda examining the impacts of COVID-19 on

1 We use words such as "impact" and "effect" for simplicity, not to suggest causality. Our goal is not to identify the myriad factors that explain how the pandemic impacted achievement, but rather to document current achievement patterns relative to pre-pandemic trends.

education outcomes. Here, we build upon our initial findings to examine students' academic progress one year into the pandemic. The shared goal of this brief and of our broader research agenda is to provide insight to education leaders and policymakers so, as we work together toward recovery, we can use this critical moment in education to radically rethink how programs, policies, and opportunities are allocated and fiercely commit to distributing resources to communities most impacted by the pandemic.

Framing

We acknowledge that focusing on differences between race and ethnicity groups, as done in this report, may be seen as adopting a deficit-based perspective. This orientation can be problematic because it can perpetuate victim-blaming and fails to acknowledge academic strengths that are not reflected in standardized metrics. However, disaggregating outcomes by race and ethnicity can help highlight the extent of inequity. As we collectively begin the process of recovery, we must confront the highly inequitable pre-pandemic state of education in this country. This is the time, more than ever, to fundamentally reshape how opportunities and resources are allocated and deploy supports where they are most needed, now and into the future.[2]

For this paper, we address two questions aimed at providing education leaders and policymakers with the evidence needed to best support students and schools. As school districts plan for post-pandemic recovery, they must identify which students have been most affected. Thus, we summarize overall trends in achievement in 2020–21 and examine to what extent these trends differ across groups (specifically, race/ethnicity at the student level and percentage of economic disadvantage amongst students at the school level).

Using data from 5.5 million students in grades 3–8 who took MAP Growth assessments in reading and math, we examined two primary research questions:

1. How do gains across the 2020–21 school year compare to pre-pandemic trends?
2. How does student achievement in spring of 2021 compare to pre-pandemic levels?

To contextualize 2020–21 relative to pre-pandemic trends, we use 2018–19 MAP Growth data as a benchmark.[3] The 2018–19 school year is the most appropriate pre-pandemic point of comparison given it is the most recent academic year that was unaffected by COVID-19.

2 For policy considerations and recommendations based on the findings, please see the accompanying brief[ii] prepared by the NWEA Policy and Advocacy team.

3 We limited our sample of schools to a consistent set of US public schools that tested at least 10 students in a given grade in both 2018–19 and 2020–21. This restriction reduces the degree to which changes in the NWEA partner base may affect the results we observed. See the technical appendix for more details about the analytic samples.

Students made gains in 2020–21, but at a lower rate

To assess students' gains in 2020–21, we calculated mean RIT scores for the fall, winter, and spring of the 2020–21 school year and present them alongside mean test scores for the same test seasons in 2018–19. Figure 1 plots the means of third-, fifth-, and seventh-grade students for each test period (fall, winter, and spring), connecting them with a straight line to show average gains for each school year (2018–19 has a dotted line and 2020–21 has a solid line). We use these three grades to streamline the figure, but note that patterns are similar across all grades 3 to 8 (see technical appendix[iii] figures A1 and A2 for reading and math plots for grades 3–8). Comparing mean trajectories for 2020–21 to 2018–19, we see that, in aggregate, students made some gains (the solid lines show a general upward trajectory across the majority of grades and subject areas), but trajectories were diminished relative to a typical year (the solid and dotted lines are not parallel).

Figure 1 also shows that mean trajectories between fall and winter of the 2020–21 school year were more consistent with trajectories in the comparison year than were the winter-to-spring trajectories; in other words, the trajectories become more divergent over time, suggesting that gains stalled later in the year.

Using MAP Growth data to understand COVID-19 education impacts

MAP Growth is a computer adaptive test that is vertically scaled across grades K–12 and measures student achievement in reading and math on the RIT (Rasch unit) scale. Because the RIT scale is an equal-interval, cross-grade scale and the assessment adapts above and below grade level, RIT scores can be used to compare achievement across students and time—within an academic year and over multiple years. In addition, NWEA's nationally representative normsiii[iv] (which were calculated with a pre-pandemic sample of students) can be used 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 equal to or above 40% of other third-graders).

In this study, we used both students' RIT scores and their achievement percentile ranks in reading and math. We examined RIT scores across the 2020–21 school year to address our first research question about gains over the course of the year. For this analysis, we averaged RIT scores for a given term. By looking at differences in average RIT scores over the fall, winter, and spring testing seasons of 2020–21, we infer patterns of "gains" and can compare these to the 2018–19 baseline year.[4]

We examined percentile ranks to address our second research question about end-of-year achievement in reading and math. For this analysis, we compared spring percentiles for students in 2021 to the cohort of students who tested in spring of 2019. For simplicity, given in all grades and subjects we find that spring 2021 percentiles are lower than spring 2019 percentiles, we use "decline" to denote percentile rank differences between the two cohorts of students. Accordingly, these analyses describe cohort differences and not within-student change over time.

4 More detailed analyses, currently underway, are necessary to examine within-student patterns of growth. We provide a simple estimate of student "gains" by measuring the average within-student RIT score change (gain = spring RIT – fall RIT) and report these numbers in the accompanying technical appendix in the final two columns of Table 4.

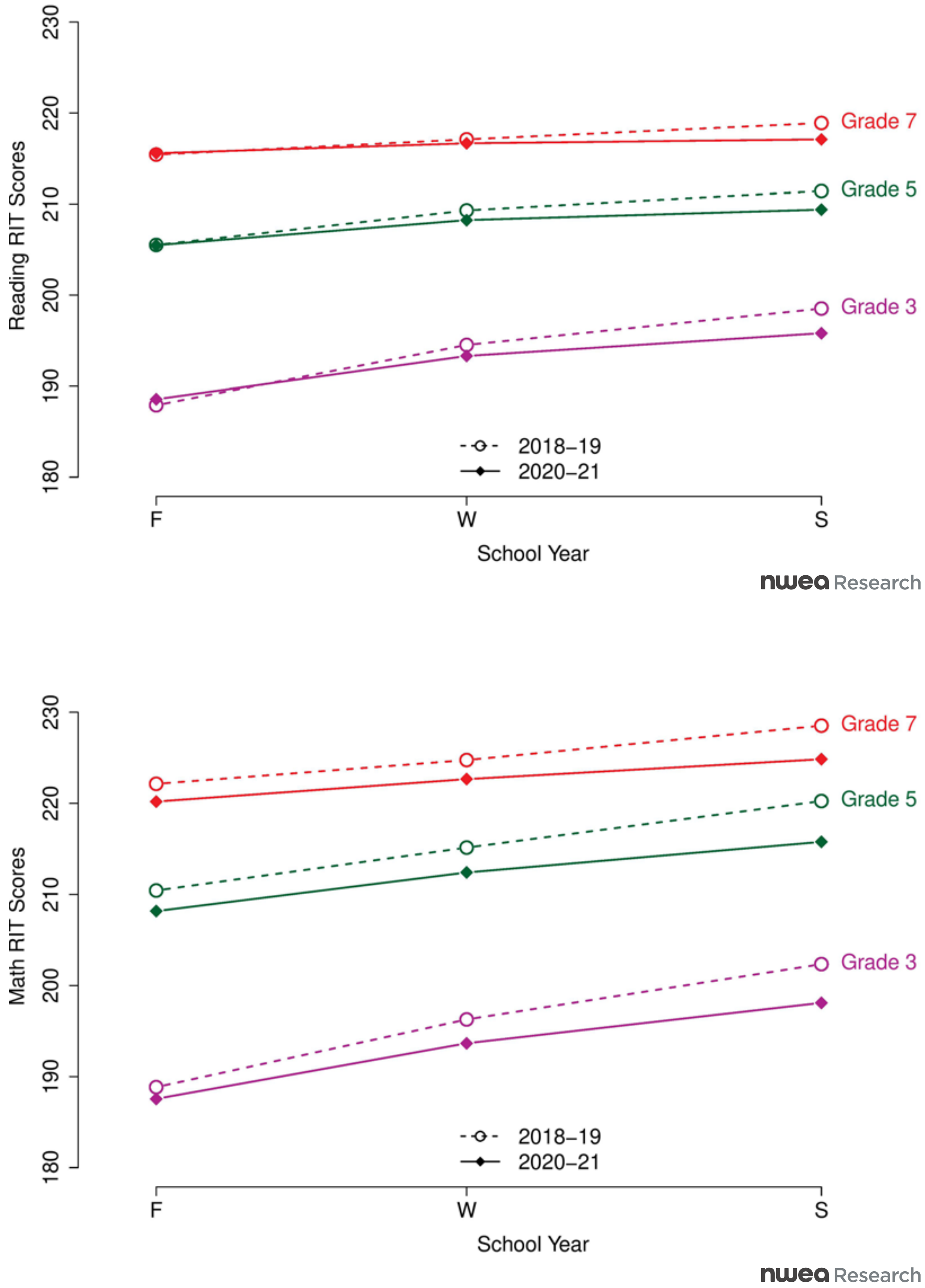

Figure 1. Mean MAP Growth RIT scores for selected grades in reading (top panel) and math (bottom panel)

Note. For simplicity, these figures depict results for fall, winter, and spring in grades 3, 5, and 7 (non-depicted grades show similar trends). See technical appendix figures A1 and A2 for all grades.

Students' achievement at the end of the 2020–21 school year was lower compared to pre-pandemic levels, with larger declines in math

In addition to asking how students' gains over the 2020–21 school year compared to 2018–19, it is important to understand where students ended the school year in order to plan for what to expect when students return to the classroom in the fall of 2021. Accordingly, we examined spring 2021 achievement levels (based on NWEA 2020 MAP Growth norms[iv]) compared to spring 2019.

To summarize end-of-year achievement this year relative to a typical year, we calculated the median achievement percentiles for students in spring 2021 and spring 2019 as well as the difference in percentile rank between these years. Figure 2 displays the achievement levels of the pre-pandemic and pandemic cohorts, as well as the difference between the two, separately by grade level for reading (left panel) and math (right panel). To illustrate, in the spring of 2019, median math achievement for third-graders was at the 55th percentile, but in the spring of 2021, median math achievement was at the 43rd percentile, a difference of 12 percentile points.

In contrast to our previous findings, where students began fall 2020 with reading achievement roughly comparable to historical averages, we observe declines of between 3 to 6 percentile points in reading achievement in the spring of 2021 relative to pre-pandemic spring achievement levels. In math, students entered the 2020–21 school year achieving 5 to 10 percentile points lower than same-grade students in a pre-pandemic year. We find that the differences in math achievement relative to pre-pandemic trends have increased over the 2020–21 school year and students' average spring 2021 math achievement is now between 8 to 12 percentile points lower than a typical year.

Spring achievement declines were particularly evident for students in grades 3–5

Achievement was lower in math and reading for all grade levels, but slightly larger differences were observed in the earliest grade levels we examined, corresponding to the late elementary school period. The declines for third- to fifth-graders were larger in magnitude than those for older students by 1 to 3 percentile points in reading and 3 to 4 percentile points in math (see Figure 2).

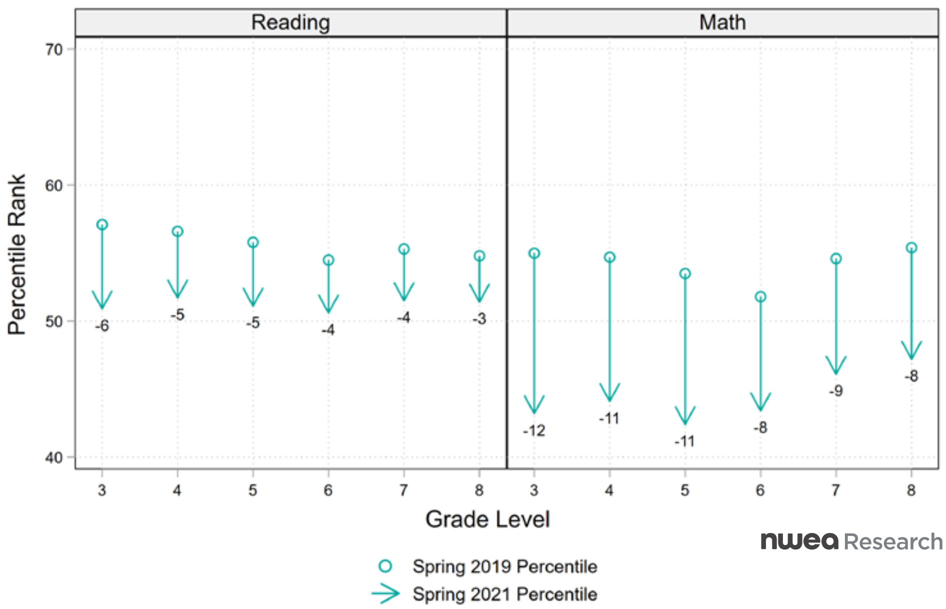

Figure 2. MAP Growth percentile rank difference between same-grade students in spring 2019 (circles) and students in spring 2021 (arrows) in reading (left panel) and math (right panel)

Note. The circles represent the median percentile rank for the pre-pandemic (spring 2019) cohort and the arrows represent the change in median student percentile rank for the spring 2021 cohort.

Remote testing

The majority of fall 2020 MAP Growth tests were administered remotely, but remote testing decreased over the course of the year (down to 54% of tests in the winter and 46% in the spring) as more schools returned to in-person instruction. We previously released evidence for comparability across testing modalities for students in grades 3–8 (see our comparability study[v]). For the purposes of this brief, we examined basic metrics of test quality across the 2020–21 school year and found a consistent pattern across test seasons (see technical appendix[iii] for more details) which further bolsters our confidence in the quality of remote test scores for the grades included in this analysis.

Historically marginalized and economically disadvantaged students had larger declines in math and reading relative to advantaged peers

In Figure 3 we show percentile rank changes disaggregated by student race/ethnicity. This allows us, for example, to situate the achievement of Asian American students in spring of 2021 relative to the achievement of a cohort of Asian American same-grade students in the spring of 2019.

Figure 3 shows that all student groups were impacted in reading and math. However, the magnitude of these differences was uneven across student groups. Asian American and white students showed declines of a smaller magnitude relative to overall averages and relative to other student groups; AIAN, Black, and Latinx students showed declines of a greater magnitude. The disproportionate size of these declines is particularly concerning given the differential spring 2019 achievement among these student groups. Put simply, the students who could least afford to lose ground relative to other students are those who were the most impacted, and especially so in math.

Similar to the overall trends noted above suggesting differences between older and younger students, the largest percentile differences were generally more concentrated in the late elementary school period.

Who is missing from our data?

One worry with our 2020–21 test data is whether it is reflective of all the students we serve. In the fall of 2020, we reported systematic patterns of missingness in our data showing that the demographic makeup of the current year's data is different from that of prior years because of higher rates of attrition for some student groups (see our attrition analysis brief[vi]). Unfortunately, we know that particular student populations were more likely to encounter learning barriers throughout the year and this may have prevented them from participating in testing.

To examine this in our data, we calculated attrition rates to measure the percentage of students who were tested in the prior year but were *not* tested in the current year. We found that the overall attrition rate in 2020–21 was about 20% (that is, about 1 in 5 students who tested in the prior year were missing from this year's assessment data). This rate is higher than normal (for instance, the overall attrition rate in 2018–19 was 13%), which is to be expected given the challenges of this past year. However, we see even higher attrition rates during 2020–21 for AIAN, Black, and Latinx students (ranging from roughly 22% to 25%) and for students who scored in the lowest achievement quintile in the 2019–20 fall test administration (roughly 22%).

There is more work to do to understand the implications of these patterns. However, for the results we present in this brief, the patterns of missing data may mean that we have overestimated academic achievement and gains in 2020–21 compared to prior school years. In other words, the true impacts of the pandemic on academic achievement this year may be even more pronounced than what we report. We present a more detailed look at the missing data patterns in our technical appendix.[iii]

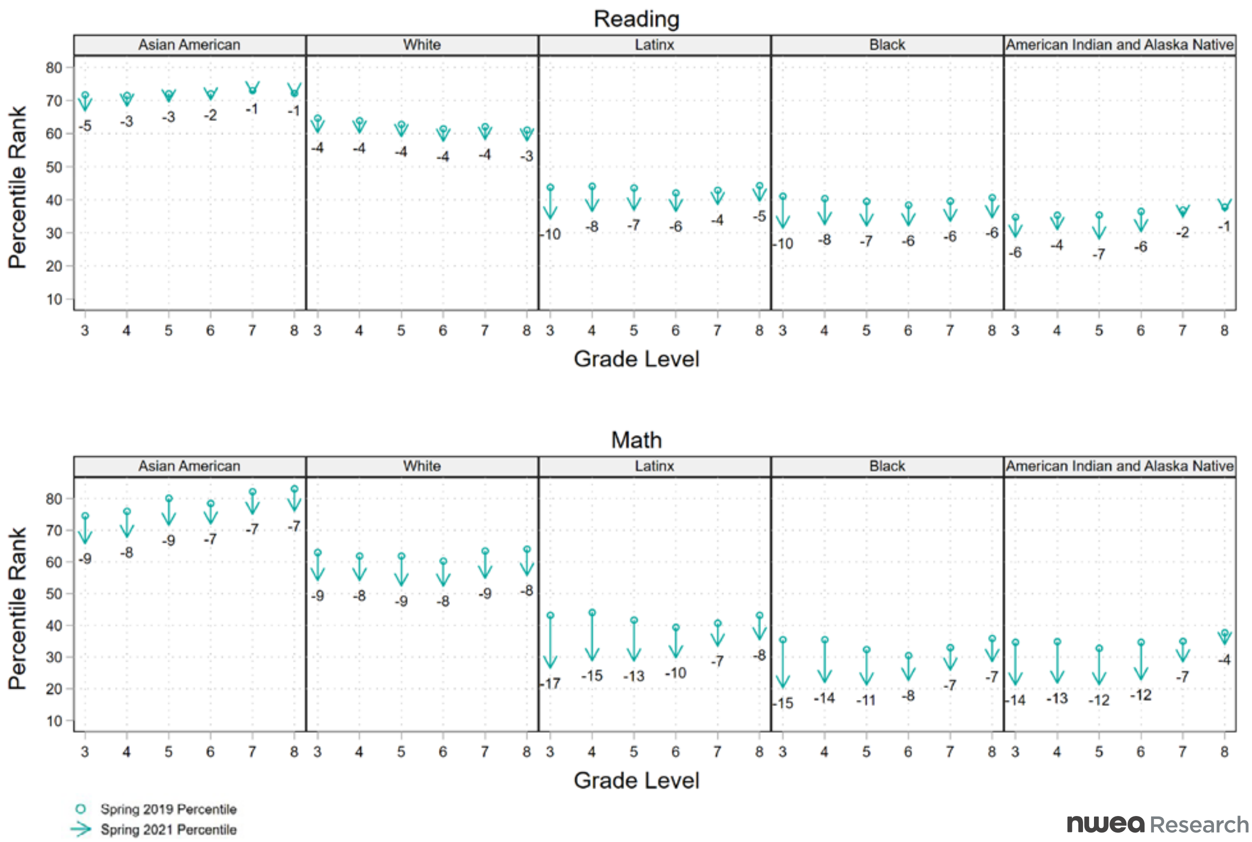

Figure 3. MAP Growth percentile rank difference by cohort and race/ethnicity in reading (top panel) and math (bottom panel)

Note. The circles represent the median percentile rank for the pre-pandemic (spring 2019) cohort and the arrows represent the decline in median student percentile rank for the spring 2021 cohort.

In Figure 4 we show percentile rank changes by school poverty level.[5] Here we see that students in more economically disadvantaged schools were the most impacted by the pandemic. In many grades, students attending high-poverty schools showed more than double the declines of students attending low-poverty schools. This uneven pattern of declines occurred amidst already unequal starting status differences between students in high- versus low-poverty schools. Students in low-poverty schools in 2020–21 still achieve well above the national average, even with percentile point declines ranging from 6 to 9 percentile points. In contrast, the pre-pandemic cohort of students in high-poverty schools achieves well below national averages and the declines we see in the 2020–21 cohort have served to widen already significant achievement disparities between these two groups.

These results also show evidence of the trend highlighted above suggesting younger students were more impacted than older students. For instance, third-graders in high-poverty schools showed an 11 percentile point decline in reading and a 17 percentile point decline in math, whereas seventh-graders in high-poverty schools showed a 3 percentile point decline in reading and a 6 percentile point decline in math.

5 Data on school poverty comes from the Stanford Education Data Archive (SEDA).[vii] For simplicity, we present data for schools defined as low poverty (less than 25% of students receiving free- and reduced-price lunch) and high poverty (more than 75% of students receiving free- and reduced-price lunch).

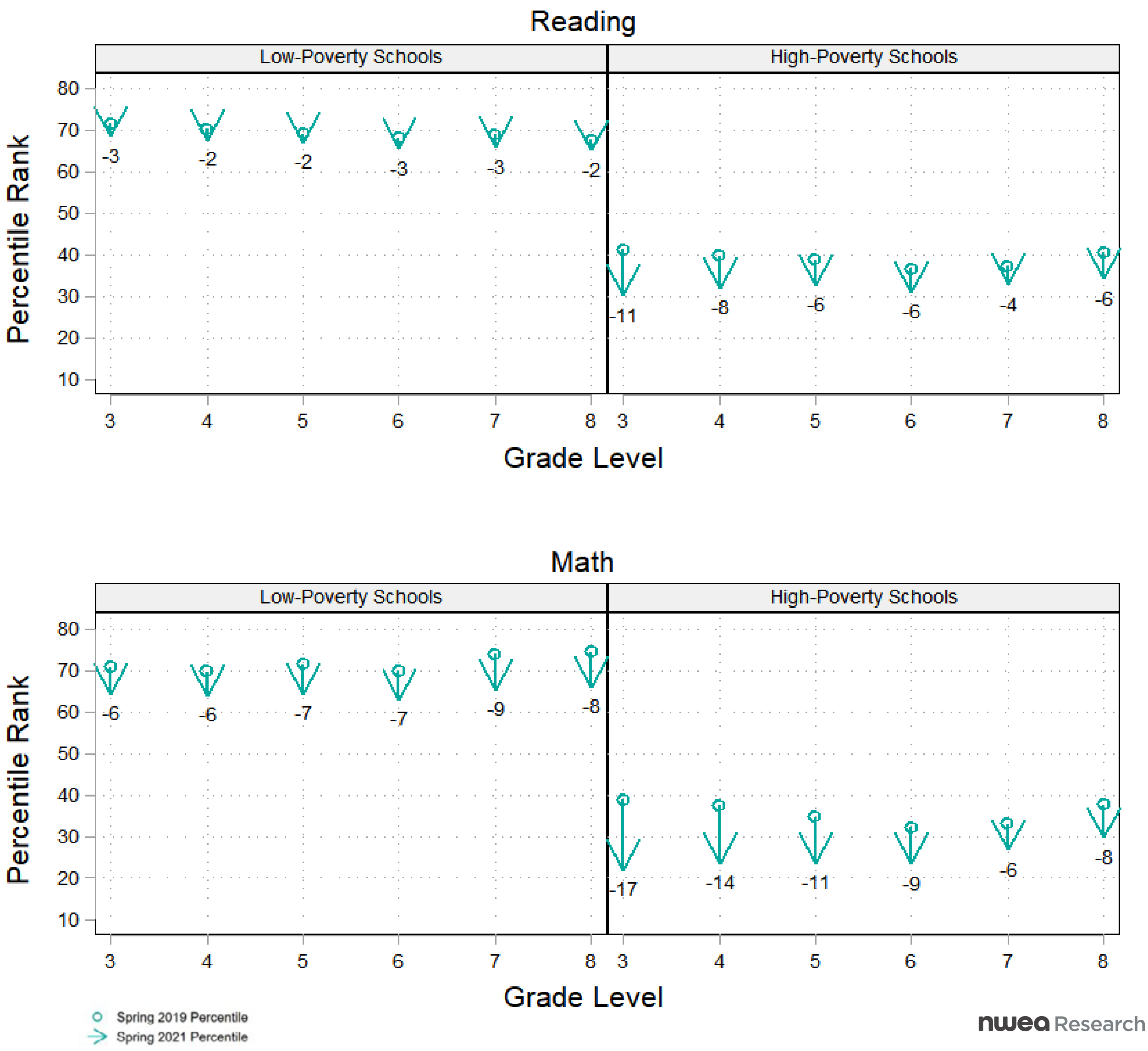

Figure 4. MAP Growth percentile rank change by school poverty level in reading (upper panel) and math (lower panel)

Note. The circles represent the median percentile rank for the pre-pandemic (spring 2019) cohort and the arrows represent the decline in median student percentile rank for the spring 2021 cohort.

Summary

Together, these findings suggest that students fared worse academically by the end of the 2020–21 school year compared to what we first reported in the fall. Reading achievement was a bright spot in the fall of 2020. However, we now see that reading achievement is no longer holding steady, but rather showing evidence of impacts, although these declines were not as dramatic as those in math. Math achievement was doubly impacted this year: students started the school year with lower achievement than prior years and made less than typical gains over the course of the year. As a result, spring 2021 math achievement fell even further behind historical trends—the difference of 5 to 10 percentile points in fall of 2020 widened to a difference of 8 to 12 percentile points in spring of 2021.

Early learning experts worried that younger students would be more severely impacted by disruptions to traditional instruction and the transition to online learning.[viii] Our data show some evidence in support of these concerns in that we see larger achievement impacts for the lower grades in our sample. These differences are small, but the trend is consistent across reading and math.

Overall, students made some gains in reading and math during the 2020–21 school year; however, these gains were lower relative to a typical year and the rate of average gains stalled more between winter and spring. Our data cannot explain the causes, but one possible explanation is increasing pandemic fatigue. A recent study from California's CORE districts[ix] found that students reported improvements to their online learning environment over the past academic year (which underscores the heroic efforts of educators to improve virtual instruction); but the continued strain of the pandemic took its toll on students and their families throughout the school year. One indicator of this is that students reported liking school less in the winter compared to the beginning of the year. This point is especially relevant given that schools began remote instruction in spring 2020, and by the end of winter 2021, many students had nearly a full academic year of remote schooling.

Finally, and most importantly, our findings help us understand where the education impacts of the pandemic have been most acute. As we summarized in a recent paper,[x] the pandemic has exacerbated longstanding educational inequalities for marginalized students: over the last year, students of color were less likely to be learning in person and more likely to encounter obstacles in accessing instruction compared to white students. The unequal impacts of the pandemic extend beyond education: communities of color were more likely to bear the economic and health consequences of the pandemic. The compounding toll of these burdens appears to be borne out in our findings. We report the largest achievement declines for AIAN, Black, and Latinx students, and for students attending high-poverty schools. These declines are of greater magnitude in math than reading and for younger students. Altogether, these results highlight that the COVID-19 pandemic impacted marginalized students more, and as a result, exacerbated pre-existing inequities in educational opportunities and outcomes.

CALL TO ACTION

Academic achievement is only one dimension of students' education, and these data alone cannot paint a complete picture of how young people fared this past year. For instance, our results cannot speak to the many ways students, families, and teachers have shown incredible resiliency and adaptability in the face of immense challenges that completely upended normal life. We look forward to learning from these bright spots in the coming months.

In the meantime, our latest findings underscore that there is much work to be done on the path to recovery. As daily life increasingly returns to "normal," we must confront what this means in the context of education. As our findings show, even if recovery is swift and students return to pre-pandemic levels of achievement, significant inequities will persist. Thus, our collective call to action is clear: **next year cannot be a "normal" year.** We cannot return to the classroom and do things the same as they have always been done and expect to see a different outcome. Instead, we must use this critical moment in education to radically rethink how programs, policies, and opportunities are designed and fiercely commit to prioritizing the communities most impacted by the pandemic and distributing resources accordingly. We hope that our findings equip education leaders and policymakers with the evidence needed to do this and we look forward to being a partner in the hard work ahead.

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Details on the methodology behind these analyses can be found in:

Kuhfeld, M., Ruzek, E., Lewis, K., McEachin, A. (2021). Technical appendix for: Learning during COVID-19: Reading and math achievement in the 2020–21 school year. NWEA.

Suggested citation:

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Guided reading reimagined: How to close reading gaps with differentiation and scaffolding

Lynne Kulich

My earliest reading memory is of my three-year-old self seated on my grandma's lap in her living room while she read and reread *Old Hat New Hat* by Stan and Jan Berenstain. I don't recall why I was so fond of that book, but I'm guessing the repetitive text with picture cues, which made it easy to decode and comprehend, had something to do with it. In addition, I love the main idea gleaned from the story: the perfect hat just might be that old hat made new again.

Guided reading is like that old hat/new hat notion; sometimes what's old can be dusted off, be made new, and become a perfect fit.

What we now know about guided reading

In the early 2000s, I taught first-, second-, and third-grade students, and guided reading was a weekly practice in my classroom. Each fall I administered reading benchmark assessments in search of data to help me group my students for guided reading based on instructional reading levels. Three days per week I rotated through reading groups and supported students while they often read text below grade level. I assumed students would become too frustrated trying to read text at grade level, and this frustration would impede meaningful reading. Were my assumptions valid? Well, let's just say I wish I could go back in time and redesign guided reading in my classroom.

According to NAEP data, only 35% of fourth-graders nationally are proficient or above on state summative reading assessments. While this data is daunting, what's even more frustrating is the data from two decades ago, which suggests fourth-grade proficiency scores haven't changed significantly. Why aren't we moving the needle for all students? The answer may surprise you.

> **[T]ext complexity is a matter of equity.**

While teachers, including myself, have certainly tried to implement best practices in hopes of closing reading gaps, we've also been limiting opportunities for students to be successfully engaged with complex, grade-level text. State proficiency exams require students to decode and comprehend text at—not below—grade level. If students are busy reading text at their instructional reading levels, albeit below grade level, how can we reasonably expect them to read grade-level text on the state summative exams and earn a proficient score? I wouldn't want to try swimming laps in the deep end of the pool if I've only been allowed to tread in shallow water. The jump from the shallow end to the deep end is best accomplished gradually, with scaffolding. The same can be said about reading grade-level text.

What about that frustration factor? Are grade-level texts too frustrating for some students? Well, they may be challenging, but research suggests students aren't "turned off" by complex text. Linda Gambrell and colleagues studied motivation and its relationship to reading in the '80s. They looked at the effects internal and external motivators have on student reading behaviors. Their studies of the relationship of text difficulty and motivation suggest either no relationship or a much more complicated one than we previously considered. When students are challenged and their learning is obvious, teachers won't need to worry about frustration or a lack of motivation. Instead, with appropriate support, students can successfully engage with grade-level text, and any frustration is mitigated.

How to help readers catch up

So, should teachers continue assessing for students' instructional reading levels? It depends. What's the purpose for leveling? If teachers use instructional levels to limit access to grade-level text, then no. Instead, seek out data shedding light on students' skills gaps, and use that data to differentiate instruction and provide appropriate scaffolds using grade-level text.

Imagine you're a second-grade teacher preparing for a new class of students this fall. More students may be reading below grade level due to interrupted or unfinished learning during the pandemic. In fact, some second-graders won't have secured phonological awareness or beginning phonics skills, all of which you don't teach because you won't find them in second-grade reading standards. Instead, based on Common Core Reading Standards, your students need to achieve the following: "By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 2–3 text complexity band proficiently, with scaffolding as needed at the high end of the range" (CCSS.ELA-LITERACY.RI.2.10).

The standards are clear: there's no time for remediation. So what's your plan? Here's what I would do, now that I know better.

- **Step 1: Administer a reading assessment** like MAP® Reading Fluency™ that provides a complete picture of a student's reading skills, from foundational skills, like phonological awareness and word recognition, to oral reading fluency.

- **Step 2: Use the assessment data** to determine students' skills gaps, and differentiate instruction and provide the scaffolding students need to read complex text at, not below, grade level. (Differentiation is the different activities students work on that are designed to meet diverse instructional needs. Scaffolding is the different supports students need to be successful.)

- **Step 3: Strategically plan guided reading with grade-level text.** Create guided reading groups based on common skills gaps and zone of proximal development (ZPD) levels. Ask the following questions: Which students need to improve their reading rate or their reading comprehension skills? Who needs work on decoding single syllable words? Who needs help segmenting phonemes or decoding CVC words? Let the answers help you group your students.

- **Step 4: Select your grade-level text.** Consider using a science or social studies passage; they're rich in vocabulary and expository content.

Put your plan in play

Let's walk through those steps in more detail. Imagine you have four second-graders performing below grade level who, based on their MAP Reading Fluency data, have Oral Reading Lexile® measures below the typical Lexile oral readability range for text in second grade, i.e., 380L–580L. Furthermore, they all need support decoding multi-syllable words. Resisting the temptation to select an easy text, you settle on a science text from Time for Kids about cicadas. (You can also search for complex text at Newsela.) Here's what your guided reading sessions can look like.

Guided reading session 1

First, review the text to determine the vocabulary and concepts you'll need to pre-teach. Focus on words like "rare," "emerge," "offspring," and "predation." Then read the passage aloud to the group, and model the components of a fluent read, i.e., rate, accuracy, and prosody. Be sure the students are following along with their own copy of the text while you read. Finally, ask some low-level inferencing questions to get a temperature check on their language comprehension skills. Engage students in word study activities and concept maps. Wrap up the session with a choral read.

Guided reading session 2

Continue to scaffold by reading the text aloud before asking the students to choral read. Next, have students partner read and provide strategic feedback on fluency skills. Ask students to choral read the text before asking for volunteers to read aloud sentences or paragraphs. (Notice how you're gradually removing scaffolds.)

Guided reading session 3

Begin with partner reading. Next, ask each student to independently read the passage while you listen to individual students and provide support as necessary, one student at a time. Lead a discussion to tap into those deeper comprehension levels, like application and synthesis. For example, ask your students, how old will you be when the offspring emerge? Why is their emergence so unique? Then assign a writing activity, because reading and writing are synergistic. Have students explain what Michael Raupp, the expert named in the article, means by, "There are going to be songs." Finish with a readers' theatre performance.

You're a change warrior!

When you look back on all you've had to change to make learning a reality for your students during the pandemic, you're probably eager to dust off some of those tried-and-true, comfortable instructional practices this school year. Who could blame you?! I would ask you to rethink guided reading. Be sure to assess for valid data and take note of any reading skills gaps. Group students based on ZPD levels, choose a complex, grade-level text, and implement scaffolds. Instead of selecting multiple texts below grade level, plan for the most effective scaffolding to allow students to experience success with grade-level text and standards, as noted in "Teaching children to become fluent and automatic readers." The scaffolds you choose will be different for each guided reading group.

State proficiency exams require students to decode and comprehend text at—not below—grade level.

Remember, text complexity is a matter of equity. For decades, we have assigned struggling readers text below grade level. This denies them the opportunity to successfully read grade-level text, develop rich vocabulary and complex syntax, and build content knowledge. We can't continue denying complex text to struggling readers and wondering why they can't keep up with peers and meet grade-level expectations.

Trust the process. You'll be amazed at the amount of growth your students make, and that "old hat" can become a perfect fit after all. **TLG**

Finding the right focus in math: A recipe for success

Mary Resanovich

My youngest daughter's adventures in the kitchen are a source of ongoing humor in our family. Her decision to bake something is often spontaneous and, as a result, she rarely has all the ingredients she needs. Her response when faced with a lack of required supplies is often more creative than logical. She has been known to double up on one seasoning to accommodate for not having another or to ignore the need for things like baking powder because, "The recipe only called for a little, so I didn't think it was that important."

Although some of my daughter's creations are delicious, others are flat (literally), tasteless, over-spiced, or just not quite right. Turns out that leaving out key ingredients, even when the required amount is small, or adding too much of another can have a pretty big impact. What is true for my daughter's cooking is true for many things, including math standards.

Resources can support teachers in planning instruction

As fall approaches, there is much concern over how to account for interrupted learning and learning loss due to COVID-19. With this comes concern that teachers may feel pressured to zero in on "focus skills" or "power standards" and skip standards that seem less important. Even in a more typical year, pressure to target standards that are more likely found on high-stakes assessments can lead to other standards being sped through or ignored.

When it comes to standards, as with recipes, proportions are important. Just as throwing together an equal amount of each ingredient or leaving some ingredients out altogether will not likely yield a tasty cake, giving all standards equal weight or skipping others will result in a disjointed student experience.

Although the most recent set of reforms produced deeper, more focused standards, districts and teachers still need to know how much time to devote to the various concepts and skills in a particular grade. Essentially, you need a recipe to guide how much of each standard to put into the mix. There are a host of resources that can help you appropriately prioritize standards. Achieve the Core's focus documents categorize Common Core State Standards (CCSS) for math at each grade as either major, supporting, or additional, for example. Many other standards have similar types of documents. In each case, the intent is that all standards should be taught, but these classifications help allot classroom time appropriately.

When used correctly, resources such as focus documents or the introductory materials for a standard set or grade level can help districts and teachers find the right balance. Well-thought-out documents can act as the recipe to support a deep, comprehensive, and cohesive understanding of mathematics. However, one must be cautious of using the idea of "power standards" to justify skimping on or skipping other standards completely.

Material can't be skipped

When faced with the task of catching students up on missed learning, it can be tempting to skip standards that are perceived, or sometimes explicitly named, as less important. Doing this risks eroding later mathematical understanding. To use the CCSS as an example, kindergarten and first grade each contain a standard about composing and decomposing shapes. While not major work of those grades, these standards develop the foundational idea that the area and volume of a figure are the sum of their (non-overlapping) parts, which are major understandings of third and fifth grade, respectively.

[T]he goal of mathematics is not to amass a collection of isolated pieces of understanding, but to cook up a rich, interconnected web of conceptual understanding and skills.

Frequently, foundational concepts such as the composition and decomposition of shapes are presented in an exploratory way. To offer another example, early fractions concepts are often introduced by having students explore equal shares; multiplication concepts are developed by initially exploring arrays. Because these standards are often standalones within their grade, they may be left off power standards lists. However, racing through or skipping these standards impedes sense making, breaks the coherence of the standards, and reduces math to a series of disconnected skills.

Understanding how everything connects

In addition to focus documents, which can support planning instruction, progressions documents and coherence maps can help you understand how standards relate within and across grades. Remember, as with a recipe, the magic happens not by compiling a collection of isolated ingredients, but in combining them in the right proportion. Simply gathering a bag of flour, a bag of sugar, and a carton of eggs does not give you a cake. Similarly, the goal of mathematics is not to amass a collection of isolated pieces of understanding, but to cook up a rich, interconnected web of conceptual understanding and skills.

Grade-level standards are parts of a whole that interact when combined with each other like the ingredients in a cake. Understanding how your grade-level standards relate to each other and fit within the entire standard set can highlight the foundation laid by certain standards and help determine how to provide the appropriate amount of focus to the most critical standards without sacrificing others. Knowing how the standards relate—how your ingredients influence one another—can help you determine efficient and appropriate ways to support unfinished learning.

The table below shows how Achieve the Core has categorized the fifth-grade CCSS math standards by cluster.

Grade 5 CCSS math standards

MAJOR WORK	**Number & operations: In base ten**	• Understand the place value system • Perform operations with multi-digit whole numbers and with decimals to hundredths
	Number & operations: Fractions	• Use equivalent fractions as a strategy to add and subtract fractions • Apply and extend previous understandings of multiplication and division to multiply and divide fractions
	Measurement & data	• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition
SUPPORTING WORK	**Measurement & data**	• Convert like measurement units within a given measurement system • Represent and interpret data
ADDITIONAL WORK	**Operations & algebraic thinking**	• Write and interpret numerical expressions • Analyze patterns and relationships
	Geometry	• Graph points on the coordinate plane to solve real-world and mathematical problems • Classify two-dimensional figures into categories based on their properties

You'll notice that the standards about representing and interpreting line plots are not the major work of the grade. They are, however, designed to support and provide application opportunities related to the major work of adding and subtracting fractions with unlike denominators. When considering how to use class time, the work with line plots should be incorporated into the major work with fractions and not taught in isolation.

Similarly, converting measurement units is also not the major work of the grade and is an extension of the work begun in fourth grade. However, adding conversion from a smaller unit to a larger unit to fifth grade allows this work to be incorporated into the major work of place value and computation with whole numbers and decimals. Unit conversions also develop foundational understanding of proportional relationships that will be learned in grades six–eight. Think of these supporting standards as the lemon zest of a recipe: they enhance the flavor of the other standards and add depth to the learning.

While the additional work of the grade may not immediately support the major work, the table below shows how one fifth-grade cluster of additional standards builds key conceptual understanding for later grades. You can see how skipping or skimping on the fifth-grade graphing standards would directly impact significant later work.

How CCSS math standards build on each other

GRADE 5 ADDITIONAL WORK CLUSTER	• Graph points on the coordinate plane to solve real-world and mathematical problems
GRADE 6 MAJOR WORK CLUSTERS	• Apply and extend previous understandings of numbers to the system of rational numbers • Understand ratio concepts and use ratio reasoning to solve problems
GRADE 7 MAJOR WORK CLUSTER	• Analyze proportional relationships and use them to solve real-world and mathematical problems
GRADE 8 MAJOR WORK CLUSTERS	• Understand the connections between proportional relationships, lines, and linear equations • Understand congruence and similarity using physical models, transparencies, or geometry software • Understand and apply the Pythagorean theorem

Slow and steady wins the race

In thinking about the various progressions within a standard set, be cautious not to overemphasize the end of the progression. The goal is not to race to the end point, such as rushing to fluency in a computation progression. This type of thinking reduces the progression to a single ingredient.

The end of a progression, whether it be application of concepts and understandings in problem solving or the development of procedural fluency, is the result of combining several ingredients that add depth and cohesion to the result. For example, the whole number multiplication progression ends in fifth grade when students are expected to fluently multiply multi-digit numbers using the standard algorithm. Underlying the algorithm are grasping multiplication as equal groups and comparisons, knowledge of basic multiplication facts, and an understanding of place value, arrays, and area models that were developed in previous grades.

Give yourself time to think

As you prepare to head back to school this year, give yourself time to take stock of all the “ingredients” in your standards cupboard. What is the role of each ingredient? Are they the base, like the flour in a recipe? These are the significant works of a grade. Are they a binder, like eggs? Perhaps these are the supporting standards. Are they a smaller ingredient, like the vanilla or the cinnamon? While these ingredients might not be technically required to make the cake, removing them will greatly affect the end result.

Knowing how each ingredient interacts with the other, what their role is in the overall creation, and what proportion is required of each is the difference between creating a delicious treat and eating one of my daughter’s over-spiced muffins. Similarly, understanding the structure and relationship of a standard set, and considering how each standard interacts, introduces, supports, or extends various other standards, is critical in developing a cohesive, connected, and rich understanding of mathematics.

This year, when there may be a stronger push to trim away all but what are deemed the most important, remember—even the smallest dash of spice can enrich the overall dish. **TLG**

About the researchers

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