# K-8 Pandemic Learning Trends

Reading & Math                    2017-2022

Sofía Bahena and Camila Morales

April 2023

## About E4

To improve K-12 education and address educational inequities, school districts need timely, rigorous analyses of student outcome data. Housed within Northwestern University's School of Education and Social Policy, the Center for Education Efficacy, Excellence, and Equity (E4) is a research-practice partnership that brings together Northwestern researchers, school districts, and the technology company Curriculum Associates to produce usable knowledge for educational practitioners. The E4 Center is generously supported by The Bill & Melinda Gates Foundation.

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# Letter from the Directors

This first research brief produced by the E4 Center offers important insights into national learning trends prior to and since pandemic-related learning disruptions began in March 2020. Importantly, this research draws attention to lagging student performance and disparate learning outcomes in high-poverty and racially diverse school settings where students were already struggling to meet grade level learning expectations prior to 2020.

These findings lay the groundwork for the E4 Center's effort to improve learning trajectories and opportunities for students across the country. Through the E4 Center's unique research-practice partnership model, which includes collaboration with the digital curriculum provider Curriculum Associates, we will advance educational excellence through further analysis of national student learning data, including a deeper examination of mathematics and reading domains. With the help of our school district partners, we will continue to refine our research questions and check our assumptions, asking: Are weeks of learning the strongest metric of student performance? What does it mean for students to be "behind" when the pandemic affected everyone?

These efforts support educators working directly with students and district officials tasked with making decisions around curriculum, interventions, and policy. We see great potential in the use of data generated by i-Ready and other digital curricular tools to better understand and address the challenges faced by practitioners.

A bright spot in this research brief is evidence of growth as we move forward from the beginning of the pandemic. The E4 Center looks forward to further exploration into the contexts in which student outcomes are improving, asking why and under what conditions. Answering these questions will be essential to building a path forward in which all students succeed.

**Paul Goren**
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**Amy Auletto**
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# Contents

# Introduction

The COVID-19 pandemic has had dramatic impacts on school districts across the United States. By mid-March 2020, public schools serving over 50 million students across 48 states had closed their buildings and soon after transitioned to remote learning.[1] This shift to virtual schooling—along with pre-existing inequities in technology and internet access, public health concerns, teacher turnover, limited childcare options, and the challenges associated with parents suddenly thrust into the role of teachers themselves—dealt a blow to the learning and social-emotional well-being of youth across the country.

Since the onset of the pandemic, average math and reading scores have declined for K-12 students, with steeper drops in math performance.[2] According to the National Assessment of Educational Progress (NAEP), also known as the "Nation's Report Card," these drops are the largest recorded since assessments began in 1969.

### NAEP Mean Score Difference, 2019 vs. 2022

|  | Math | | Reading | |
|---|---|---|---|---|
|  | Difference | Rough equivalent in learning time | Difference | Rough equivalent in learning time |
| 4th grade | ↓5 points | 15 weeks | ↓3 points | 9 weeks |
| 8th grade | ↓8 points | 24 weeks | ↓3 points | 9 weeks |

Points out of a total 500. Source: NAEP

While NAEP is the country's only nationally representative standardized assessment, similar patterns have emerged at the state and local levels[3], and in other national data available through curriculum and assessment providers.[4] Furthermore, reviews of existing research have found that not all students experienced the effects of the pandemic in the same way. For low-income students, Black and Latine[5] students, and students who were already struggling in school, this time was particularly challenging.

1. Education Week (2020) provides a detailed timeline of the pandemic related disruptions across the U.S.
2. The Center for Reinventing Public Education (2022) and Betthäuser, B.A., Bach-Mortensen, A.M., & Engzell, P. (2023) provide some of the most recent reviews of the literature.
3. See, for example, Sass & Goldring (2021).
4. See, for example, Dorn, E., Hanhock, B., Sarakatsannis, J., & Viruleg, E. (2021); Goldhaber, D., Kane, T.J., McEachin, A., & Morton, E. (2022); and Kuhfeld, M., Soland, J., & Lewis, K. (2022).
5. In the interest of including all gender identities in a manner compatible with Spanish language pronunciation, we are using the term "Latine" instead of Latino, Latina, or Latinx.

# As educators know, the pandemic has only exacerbated existing inequalities.

Citing the CDC, Kuhfeld and her colleagues (2022) highlight that "communities of color disproportionately bore the economic, social, and health consequences of the pandemic" (p. 503). Indeed, these communities were more likely to get sick and die from COVID.[6]

Educators and experts agree leaders should focus on recovery efforts well past the end of the pandemic, including via sustained investment and coordinated economic, health, and education policies at every level of government. The cumulative effects of these early trends have implications for the later academic experiences and lifetime earnings of our nation's youth.

Addressing these inequities, and supporting the academic and social-emotional development of all our country's youth, will first require an accurate and dynamic picture of the state of student learning and growth.

**In what follows, we examine score trends and gaps using data from the i-Ready spring diagnostic tests of 13.5 million students in grades 1-8.**

i-Ready tests are computer-delivered formative assessments administered by Curriculum Associates at participating schools throughout the school year. Unlike high-stakes assessments (like state standardized tests), i-Ready assessments are intended to serve as an iterative measure of student progress that school leaders and teachers can use to inform practice.

In Sections 2 and 3, we use i-Ready data to describe trends in student math and reading scores over time for first through eighth grade students across the United States. In Sections 4 and 5, we explore gaps in i-Ready scores by schools' socioeconomic and racial composition.

The data include scores from the 2016-17 school year through the 2021-22 school year and capture snapshots of students' math and reading growth over an academic year. Our findings align with prior studies and contribute insight into the trends and gaps at each grade level, starting from first grade.

6. See, for example, Kuhfeld, M., Soland, J., & Lewis, K. (2022) and Saenz, R. (2020, October 30).

# 02  i-Ready Score Trends: Reading  2017 - 2022

In the decades leading up to the COVID-19 pandemic, K-12 reading performance in the US had held relatively steady. The National Assessment of Educational Progress (NAEP) reports that average fourth grade reading scores, for example, had improved slightly—from 217 to 220 (out of 500 scale points)—between 1992 and 2019. Average eighth grade reading scores also improved by three points in the same time period. However, the most recent, post-pandemic assessment in 2022 shows a loss of these modest gains. For both fourth and eighth grade students, average reading scores in 2022 looked roughly the same as the scores from 1992.

Our analyses[7] of i-Ready reading diagnostic scores reveal similar national patterns. Reading test scores exhibited a modest upward trend in grades 1 through 8 from 2017 to 2019. As with the NAEP results, we find this slight improvement was derailed by pandemic-related disruptions.

## Early Elementary Grades

### 1st Grade



### 2nd Grade
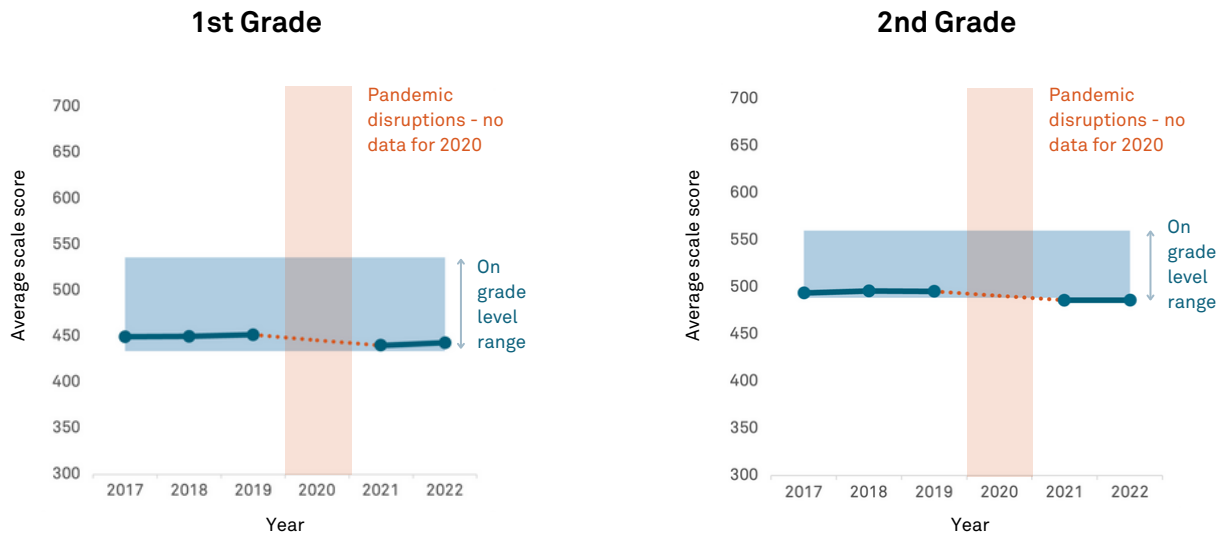


7. Reading analyses included a sample size of 13,484,746 students in 41,902 schools across the United States between 2017 to 2022. More details about our methodology can be found in our technical appendix.

As of 2022, performance in early grades had not fully recovered to pre-COVID levels. While first grade scores remain on grade level and show a slight increase, reading scores among second grade students remained as low as they were in 2021 and, on average, continue to fall just below grade-level performance.

| i-Ready Reading Score Declines from 2019 to 2021: Early Elementary | | |
|---|---|---|
| | Difference | Rough equivalent in learning time[8] |
| 1st grade | ↓11.4 points | ↓7 weeks |
| 2nd grade | ↓9.6 points | ↓7 weeks |

## Upper Elementary Grades
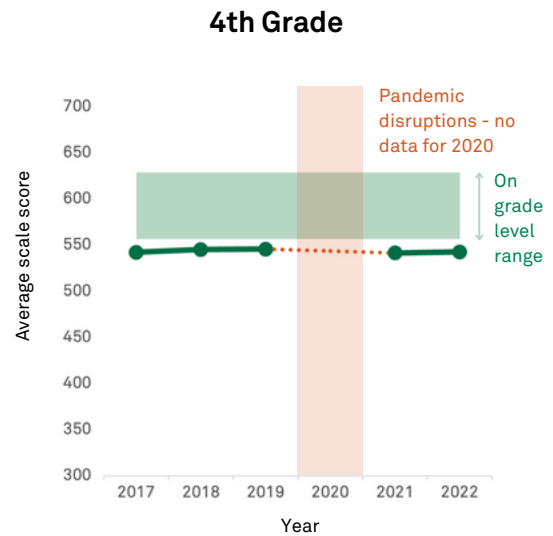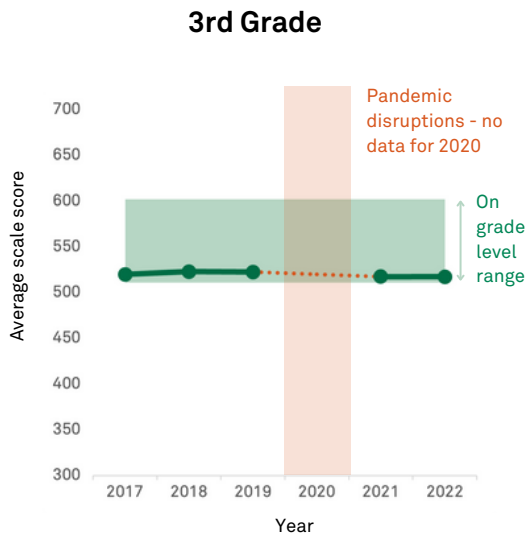
### 3rd Grade



### 4th Grade



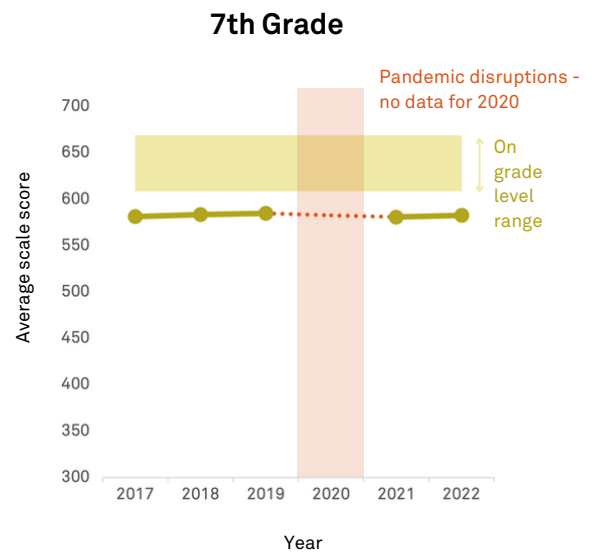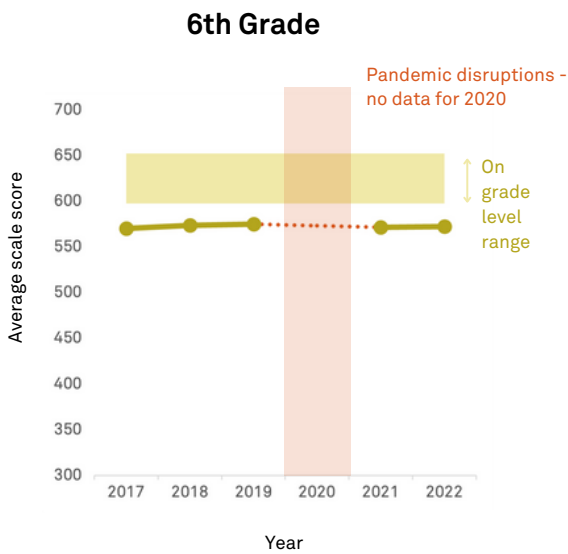| i-Ready Reading Score Declines from 2019 to 2021: Upper Elementary | | |
|---|---|---|
| | Difference | Rough equivalent in learning time |
| 3rd grade | ↓5.2 points | ↓5 weeks |
| 4th grade | ↓4.1 points | ↓6 weeks |
| 5th grade | ↓2.6 points | ↓4 weeks |

### 5th Grade
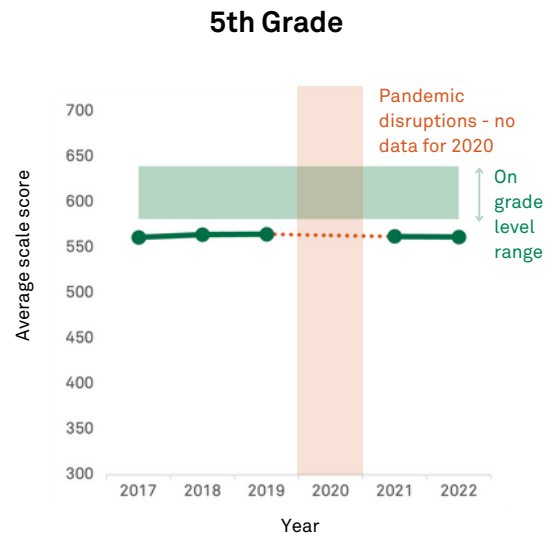


8. Please see our [technical appendix](#) for more details on how we calculated the weeks of learning estimates throughout this report.

Reading test scores for grades 3 through 5 showed a modest upward trend from 2017 to 2019. This small improvement over time was reversed following the pandemic-related disruptions, with fourth graders experiencing the greatest learning loss, an equivalent of six weeks. The average third grader in the sample experienced the greatest decline in raw scale score points, and yet, they continued to score on grade level.

As of 2022, reading scores in upper elementary grades had not recovered to pre-COVID levels. Indeed, there is evidence of a continued downward trend particularly among students in third and fifth grade.

## Middle Grades

### 6th Grade



### 7th Grade



### 8th Grade



| i-Ready Reading Score Declines from 2019 to 2021: Middle Grades | | |
|---|---|---|
| | Difference | Rough equivalent in learning time |
| 6th grade | ↓3.5 points | ↓7 weeks |
| 7th grade | ↓3.9 points | ↓9 weeks |
| 8th grade | ↓1.3 points | ↓3 weeks |
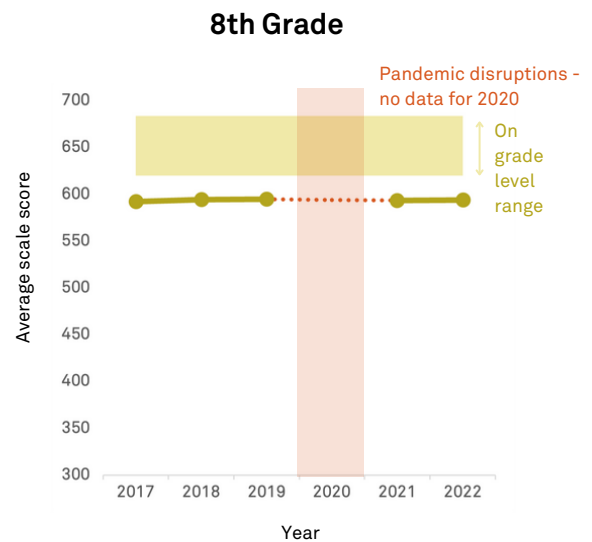
Reading test scores exhibited a modest upward trend in grades 6 through 8 from 2017 to 2019. This mild improvement over time then reversed, especially among sixth and seventh graders, after the onset of the pandemic. Seventh graders were particularly impacted, scoring the rough equivalent of nine weeks of learning below seventh graders in 2019.

As of 2022, reading scores among sixth and seventh graders had not fully recovered to pre-COVID levels; however, there is evidence of a slight upward trajectory. In comparison, reading scores among eighth graders were virtually unchanged compared to students in the same grade in 2019.

# i-Ready Score Trends: Math
## 2017 - 2022

Nationally, K-12 math performance had been steadily improving in the decades leading up to the COVID-19 pandemic. The National Assessment of Educational Progress (NAEP) notes substantial improvements in math scores from 1990 to 2019. Fourth grade math average scores, for example, had improved 27 points, from 213 to 241 (out of 500 scale points). And eighth grade math average scores had improved 19 points—from 262 to 282 (of of 500 scale points)—during the same time period. However, both fourth and eighth grade average math scores exhibited a substantial decline in 2022 compared to 2019.

Our analyses[9] of i-Ready diagnostic math scores reveal similar national patterns. We find that although math scores had been improving in grades 1-8, they declined across all grades after the pandemic and in most cases have not recovered to pre-pandemic levels.

## Early Elementary Grades

### 1st Grade
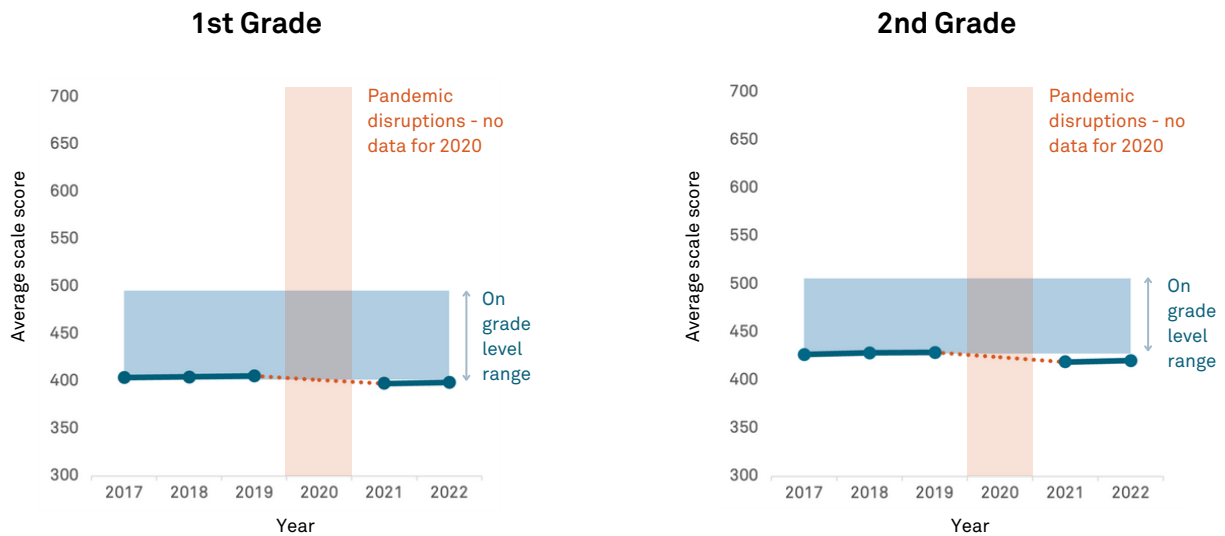


### 2nd Grade



Pre-pandemic, math test scores for first and second grade students had shown a modest but steady upward trend. However, these modest gains were interrupted by the pandemic-related disruptions of 2020. These drops meant that the average early elementary student was no longer scoring on grade level. In 2021 and 2022, first graders scored an average of

9. Math analyses included a sample size of 14,920,467 students in 46,243 schools across the United States between 2017 to 2022. More details about our methodology can be found in our technical appendix.

398 and 399 on math, respectively, both of which are below the minimum score required to be considered on grade level (402). Although scores in prior years were close to this minimum, they still met the grade-level threshold. For second grade students, the difference was more pronounced. In 2021 and 2022, second graders scored an average of 419 and 421, respectively—also below the minimum on-grade-level score (506).

| i-Ready Math Score Declines from 2019 to 2021: Early Elementary | | |
| --- | --- | --- |
| | Difference | Rough equivalent in learning time |
| 1st grade | ↓8 points | ↓8 weeks |
| 2nd grade | ↓10 points | ↓11 weeks |

## Upper Elementary Grades
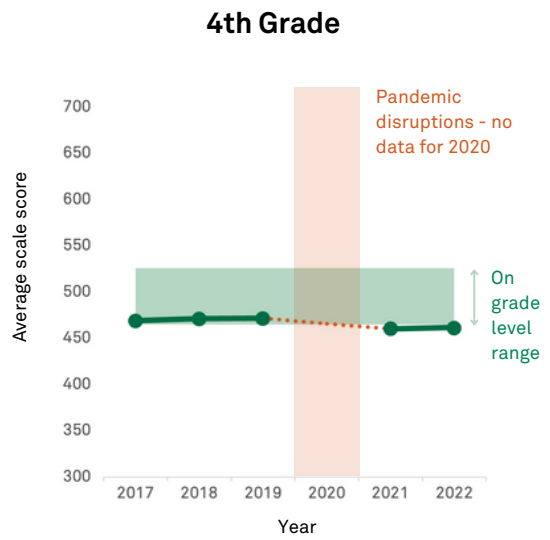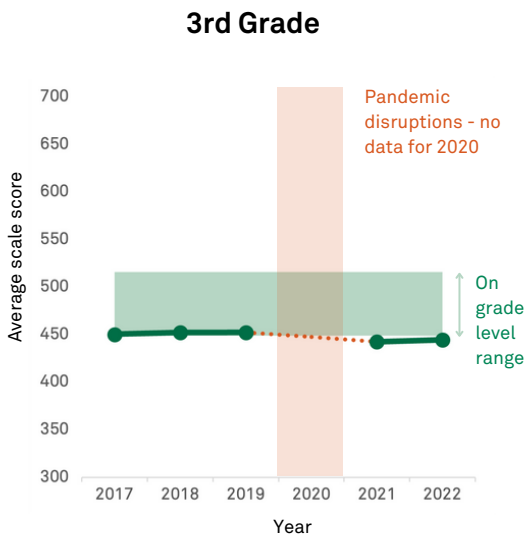
### 3rd Grade



### 4th Grade



| i-Ready Math Score Declines from 2019 to 2021: Upper Elementary | | |
| --- | --- | --- |
| | Difference | Rough equivalent in learning time |
| 3rd grade | ↓10 points | ↓11 weeks |
| 4th grade | ↓11 points | ↓15 weeks |
| 5th grade | ↓8.5 points | ↓13 weeks |

### 5th Grade
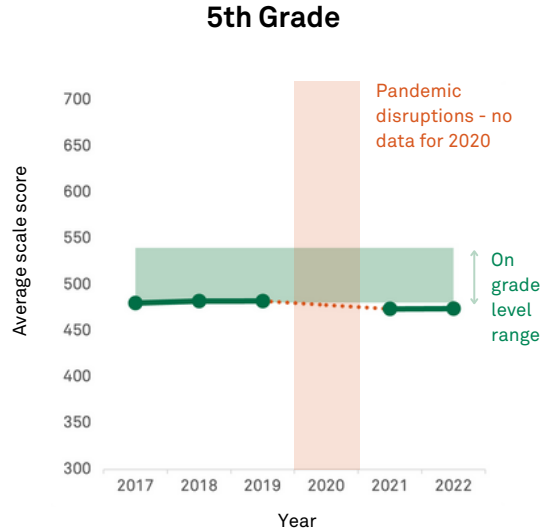
Just as we see in early elementary, upper elementary math test scores declined after the onset of the pandemic despite remaining steady in prior years. As of the most recent available data (academic year 2022), math scores had not reached pre-pandemic levels for any of the upper elementary grades.

This means that the average third, fourth, and fifth grader is not meeting the minimum standards to be considered on grade level in math. For example, the average math score for third grade students in 2021 was 442.5, below the on-grade-level minimum score of 449. This was still true for third graders in 2022. Similar patterns emerge for fourth graders and fifth graders. As of the spring of 2022, math scores in upper elementary grades had not recovered to pre-COVID levels.

## Middle Grades
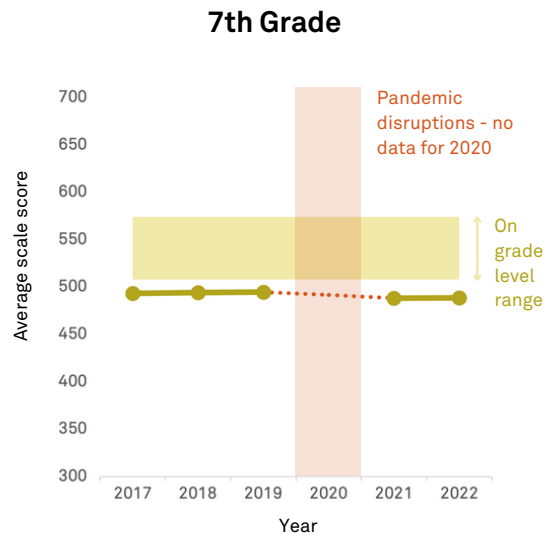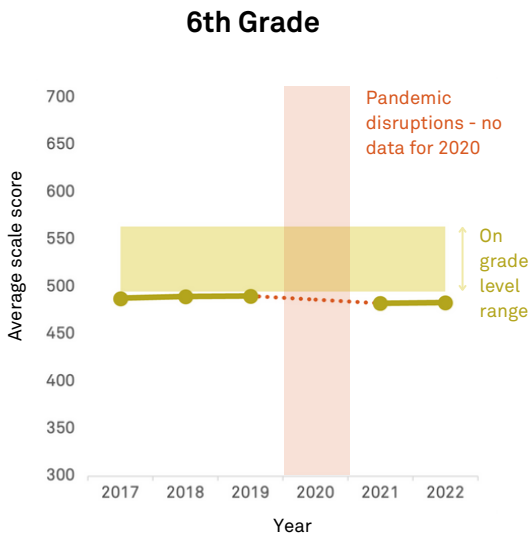
### 6th Grade



### 7th Grade



### 8th Grade



| i-Ready Math Score Declines from 2019 to 2021: Middle Grades | | |
|---|---|---|
| | Difference | Rough equivalent in learning time |
| 6th grade | ↓7.6 points | ↓18 weeks |
| 7th grade | ↓7 points | ↓19 weeks |
| 8th grade | ↓4.3 points | ↓12 weeks |
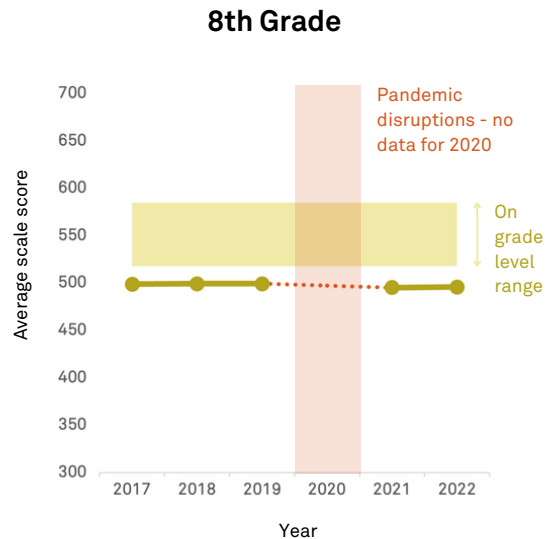
In the years prior to the pandemic, middle grade (sixth through eighth) math scores were slowly improving, before declining in the years after. These decreases have amplified the existing math challenges of middle grade students. Even before the pandemic, the average sixth, seventh, and eighth grade student was already placing below grade level. With the interruptions introduced by the pandemic, the difference between the average scores and the score required to be placed at grade level has widened.

# 04   i-Ready Score Gaps: Reading   2017 - 2022

While the pandemic had an impact on all students, existing research has documented a particularly strong negative effect on students of color and students from low-income families.[10] The National Assessment of Educational Progress (NAEP) reports that some of the greatest losses in reading scores were experienced by Black and Hispanic[11] fourth grade students.[12] Similarly, a report by McKinsey & Company estimates that students in majority-Black schools ended their 2021-22 school year about six months behind majority-white schools in reading, with majority-Hispanic schools about five months behind during the same time period. Additionally, the authors estimated that students in schools serving predominantly low-income populations also lost about six months of learning in reading.[13]



Our analyses[14] of i-Ready diagnostic reading scores reveal similar national patterns. We find that across all grade levels and all years (2017-2022), Title I schools that serve students from low-income backgrounds and schools that served the largest proportion of students of color reported particularly low average reading scores. Although the gaps already existed, they had been narrowing until the pandemic eroded the gains that had been made in previous years.

10. The Center for Reinventing Public Education (2022); Betthäuser, B.A., Bach-Mortensen, A.M., & Engzell, P. (2023); Education Recovery Scorecard (n.d.) https://educationrecoveryscorecard.org/
11. Here we use "Hispanic" rather than "Latine" because "Hispanic" is the category used by NAEP.
12. NAEP (2022) reports that the average score in reading, between 2019 and 2021, dropped five points for Black students, four points for Hispanic students, and three points for white students in fourth grade. Asian fourth-grade students did not substantially differ between the years. In eighth grade, only white students scored substantially lower (by 4 points) in 2021 than they did in 2019. There were no substantial changes for Black, Asian, or Hispanic eighth graders. https://www.nationsreportcard.gov/highlights/reading/2022/
13. The McKinsey & Company (2021) report disaggregated average household income, per school, into three categories: less than $25,000, between $25,000 and $75,000, and over $75,000. The lowest income category of "less than $25,000" was estimated to have been 6 months behind, compared to those in the middle category ("$25,000 to $75,000") and highest category ("over $75,000") who were four and three months behind, respectively.
14. Reading analyses included a sample size of 13,484,746 students in 41,902 schools across the United States between 2017 to 2022. More details about our methodology can be found in our technical appendix.

## Early Elementary: Grades 1-2

The learning losses in the aftermath of COVID also exacerbated existing learning gaps between students in high and low poverty schools[15], and those attending schools with a high and low proportion of students of color[16]. Between 2017 and 2019, students in schools with Title I status (a federal proxy measure for poverty) scored roughly 29 points below their counterparts in non-Title I schools. We see virtually the same difference in scores between students in schools serving a high proportion of students of color and students in majority-white schools.

These achievement gaps remained steady over the three years preceding the pandemic, but grew to the widest gaps seen over the entire sample period in the years after. For example, Title I status schools scored 28 points below non-Title I schools in 2019, but by 2021 the gap had grown to 31 points and even increased further to 32 points in 2022 (see figure at top right). Similarly, in 2019, schools serving the largest proportions of students of color scored 29 points below schools serving fewer students of color (see figure at right). By 2022, the gap had grown to 34 points.

**Reading Score Gaps Between Title I and Non-Title I Status Schools**

The bars above represent the difference between the scores of non-Title I schools (baseline) and Title I schools.

**Reading Score Gaps Between Schools with a High vs. Low Percent of Students of Color**

Here, the baseline is the average score at schools with the fewest students of color (the bottom quartile). The bars represent the difference between those averages and the average scores of schools with the most students of color (the top quartile).

**The pre-COVID learning gap by race/ethnicity, in 2019, already corresponded to an estimated 17 weeks of learning for first graders and 23 weeks of learning for second graders. This is more than twice the learning loss associated with the pandemic-related disruptions between 2019 and 2021.**

15. We used schoolwide Title I status as a proxy for income: https://www2.ed.gov/programs/titleiparta
16. To examine differences by race, we compared schools in the top 75th percentile in terms of proportion students of color versus the bottom 25th percentile (schools with a low proportion of students of color).
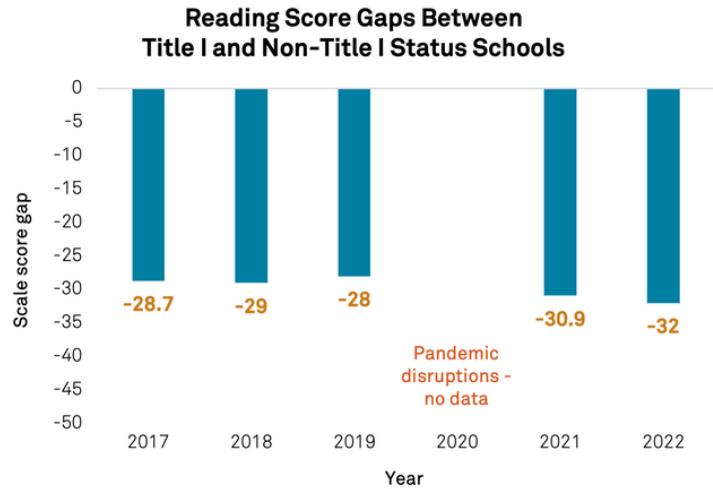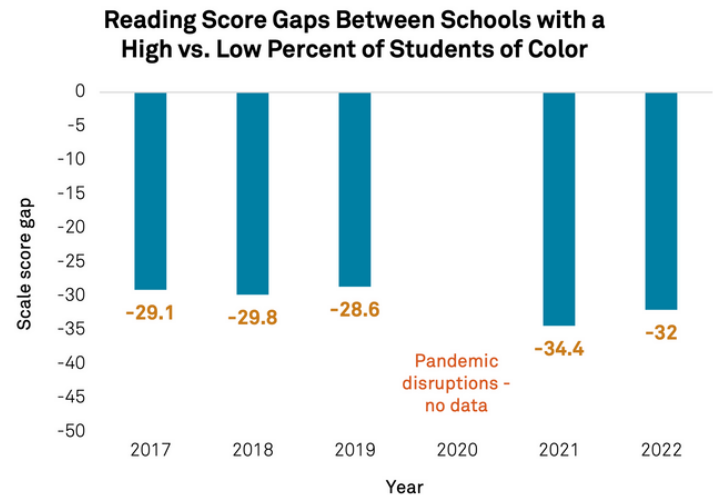
## Upper Elementary: Grades 3-5

Similar patterns emerge for students in upper elementary grades. Between 2017 and 2019, third through fifth graders attending Title I schools scored an average of 32 points below students who attended non-Title I schools. Notably, this pre-COVID learning gap eclipses the learning loss associated with the pandemic. For example, the score gaps (which ranged from 30.5 to 31.2 points) in 2019 are roughly the equivalent of 31 weeks of learning for third graders, 50 weeks of learning for fourth graders, and nearly 49 weeks of learning for fifth graders. Prior to the pandemic, students in grades 3 through 5 who enrolled in high poverty schools were, on average, more than one year behind in reading relative to students in low poverty schools. As alarming as this gap already was, the pandemic-related school disruptions increased the test score difference between high- and low-income schools to nearly 34 points by 2022.
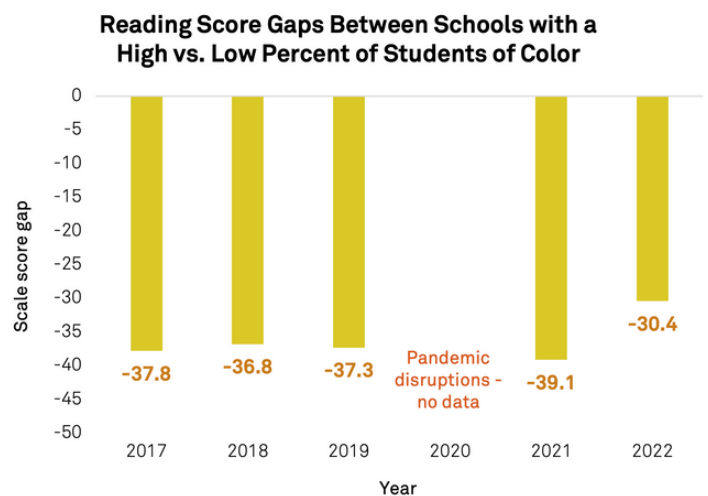
Students enrolled in schools that serve a high population of students of color also experienced a substantial decline in reading scores compared to students enrolled in schools serving a low proportion of students of color. By 2021, students in grades 3 through 5 who enrolled in schools serving a majority students of color scored nearly 39 points below students enrolled in majority-white schools; this was equivalent to roughly a five-point widening of the gap relative to 2019. Unlike the score trends by school Title I status, the data point to a shrinking gap from 2021 to 2022. By 2022, the reading score gap across schools serving a high vs. low proportion of students of color had rebounded to pre-pandemic levels. Taking a closer look at the trends, this change appears to be driven by a faster rebound in scores for students enrolled in schools that predominantly serve students of color.



**Reading Score Gaps Between Title I and Non-Title I Schools**

Year: 2017: −32.2, 2018: −32.2, 2019: −30.8, 2020: Pandemic disruptions - no data, 2021: −33.1, 2022: −33.7



**Reading Score Gaps Between Schools with a High vs. Low Percent of Students of Color**

Year: 2017: −34.1, 2018: −33.4, 2019: −33.3, 2020: Pandemic disruptions - no data, 2021: −38.6, 2022: −33.8
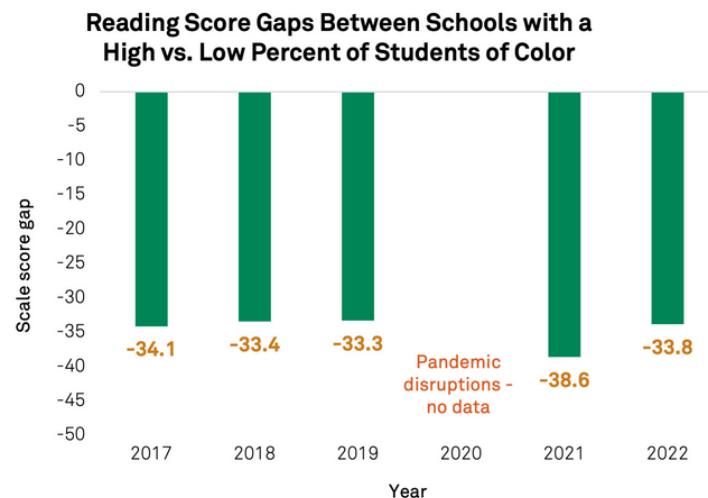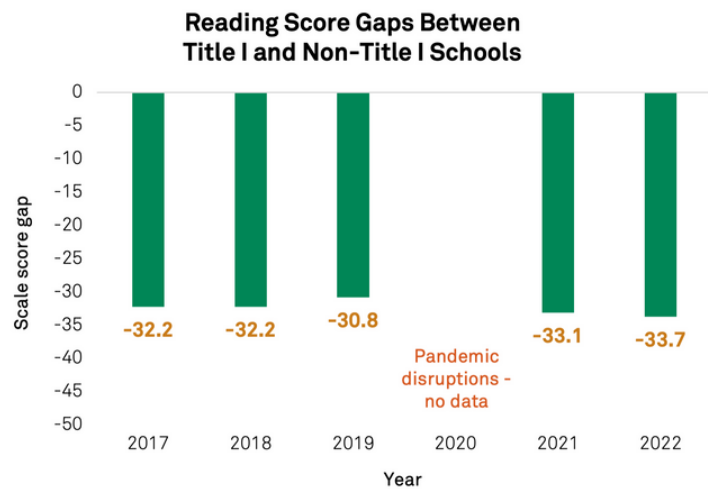
# Middle: Grades 6-8

Between 2017 and 2019, students enrolled in schools serving higher proportions of students of color scored an average of 37 points lower in reading compared to students in schools serving fewer students of color (see figure at bottom right). Notably, this pre-COVID learning gap eclipses the learning loss associated with the pandemic. For example, the score gaps in 2019 (which ranged from approximately 36 to 39) are roughly the equivalent of 72 weeks of learning for sixth graders, 90 weeks of learning for seventh graders, and 86 weeks of learning for eighth graders. In other words, prior to the pandemic, students in grades 6 through 8 enrolled in schools with higher proportions of students of color were, on average, more than two years behind in reading relative to students in schools with fewer students of color. Then pandemic-related disruptions increased the test score difference between these schools by over 39 points in 2021. Remarkably, the data indicates a narrowing of this gap between 2021 and 2022, reducing the score difference to roughly 30 points—the smallest this learning gap has been in the past six school years. Taking a closer look at the data, this change is driven by a faster rebound among schools that serve a larger proportion of students of color.

Students enrolled in high-poverty schools were less impacted, but extant learning gaps were already alarmingly wide. Between 2017 and 2019, sixth through eighth graders attending Title I schools scored an average of 26.5 points below students who attended non-Title I schools. In 2019, the score gaps (24.3-26.9 points) were roughly the equivalent of 52 weeks of learning for sixth graders, 63 weeks for seventh graders, and 57 weeks for eighth graders. Post-pandemic, the score difference increased slightly between high- and low-income schools and the learning gap remained steady up to 2022. It is also worth noting that the gap in reading scores by income is roughly 10 points smaller than the gap by race, a feature that appears to be unique to middle grades.



**Reading Score Gaps Between Title I and Non-Title I Schools**

(Scale score gap by Year)

- 2017: -27.6
- 2018: -25.8
- 2019: -26.2
- 2020: Pandemic disruptions - no data
- 2021: -27.9
- 2022: -27.3



**Reading Score Gaps Between Schools with a High vs. Low Percent of Students of Color**

(Scale score gap by Year)

- 2017: -37.8
- 2018: -36.8
- 2019: -37.3
- 2020: Pandemic disruptions - no data
- 2021: -39.1
- 2022: -30.4
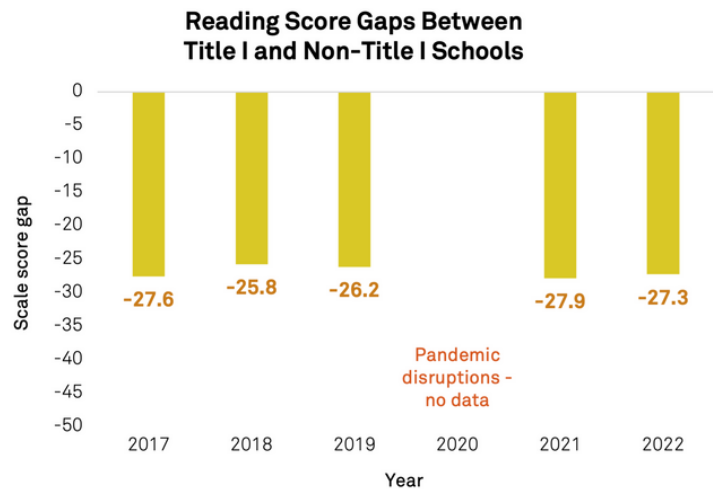
# i-Ready Score Gaps: Math          2017 - 2022

As discussed in Section 4, the pandemic had a particularly strong negative effect on students of color and students in low-income schools. The National Assessment of Educational Progress (NAEP) reports that some of the greatest losses in math scores were experienced by Black and Hispanic fourth grade students.[17] Similarly, a report by McKinsey & Company estimates that students in majority-Black and majority-Hispanic schools ended their 2020-21 school year about six months behind in math, compared to students in majority-white schools who were estimated to be four months behind. Additionally, they estimated that students in predominantly low-income schools also lost about seven months of learning in math.[18]



Our analyses[19] of i-Ready diagnostic math scores reveal similar national patterns. We find that across all grade levels and all years (2017-2022), schools with Title I status (a federal proxy for poverty) and schools that served the largest proportions of students of color reported lower than average math scores. While these gaps existed before the pandemic, they had been steadily narrowing until 2020, after which we see these modest gains start to erode.

17. NAEP (2022) reports that the average score in math, between 2019 and 2021, dropped seven points for Black students and seven points for Hispanic students. While Asian and white fourth grade students also experienced a decline in math performance, their scores only dropped by four and three points, respectively. There was little difference by racial group among eighth grade students, as all scored seven or eight points lower in 2021 than they did in 2019. https://www.nationsreportcard.gov/highlights/mathematics/2022/

18. The McKinsey & Company (2021) report disaggregated average household income, per school, into three categories: less than $25,000, between $25,000 and $75,000, and over $75,000. The lowest income category of "less than $25,000" was estimated to have been seven months behind, compared to those in the middle category ("$25,000 to $75,000") and highest category ("over $75,000") who were five and four months behind, respectively.

19. Math analyses included a sample size of 14,920,467 students in 46,243 schools across the U.S. between 2017 to 2022. More details about our methodology can be found in our technical appendix.
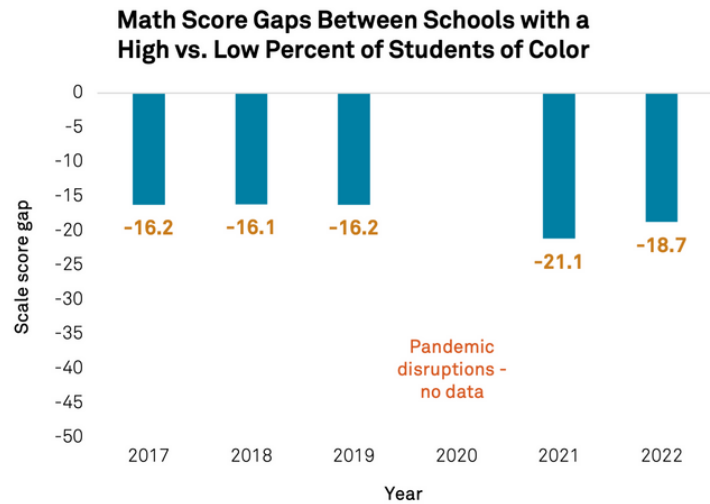
# Early Elementary: Grades 1-2

The learning losses in the aftermath of COVID exacerbated existing learning gaps between early elementary students in high- and low-poverty schools. Early elementary students in Title I schools scored lower in math than students who attended non-Title I schools, but the gaps had begun to narrow in the three years leading up to the pandemic. In 2017, the gap between Title I and non-Title I schools was almost 16 points and by 2019, the difference had decreased to just under 15 points. Even though the income-related gap had been shrinking, it is important to acknowledge that the pre-pandemic gaps (which ranged from 14 to 15 points in 2019), were still roughly the equivalent to 14 weeks of learning for first graders and 17 weeks of learning for second graders. However, in 2021, the first year after the onset of the COVID-19 pandemic, the gap had grown to 16.2 points and had only narrowed to 16 points in 2022—a difference that is still greater than the gaps in the years preceding the pandemic.

Similarly, the average math score gaps between schools with the highest and lowest proportions of students of color had held steady

**Math Score Gaps Between Title I and Non-Title I Schools**



The bars above represent the difference between the scores of non-Title I schools (baseline) and Title I schools.

**Math Score Gaps Between Schools with a High vs. Low Percent of Students of Color**



Here, the baseline is the average score at schools with the fewest students of color (the bottom quartile). The bars represent the difference between those averages and the average scores of schools with the most students of color (the top quartile).

until pandemic-related disruptions began. Between 2017 and 2019, schools with the highest proportion of students of color averaged between 16.1 and 16.2 points lower than schools with the lowest proportion of students of color. The pre-pandemic gaps roughly translate to 16 weeks of learning for first graders and 18 weeks of learning for second graders. By 2021, the gap had grown to 21.1 points, the rough equivalent of 21 weeks of learning for first graders and 23 weeks of learning for second graders. Fortunately, two
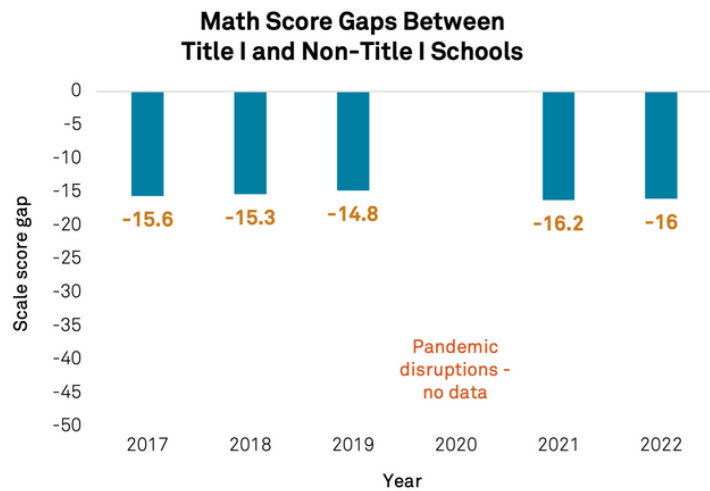
years after the onset of the pandemic schools the gap decreased to 18.7 points. Though this is still larger than the pre-pandemic gap, it shows substantial improvement in a single year.

## Upper Elementary: Grades 3-5

Similarly, the learning losses in the aftermath of the pandemic also exacerbated existing learning gaps between students i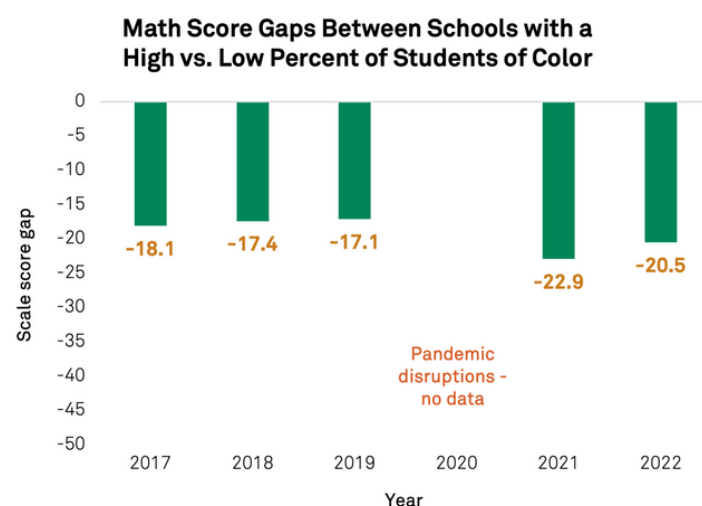n high and low poverty schools among upper grade levels. During the three previous years (2017-2019), students in Title I schools scored below students who attended non-Title I schools. For example, the learning gaps for upper elementary grades in the spring of 2019 ranged from 16 to 17 points. These differences are roughly equivalent to 17.8 weeks of learning for third graders, 23.3 weeks of learning for fourth graders, and 25.2 weeks of learning for fifth graders. This means that in some cases, students attending high poverty schools could be up to six months behind students attending low poverty schools. After the pandemic began, the test score difference between students in Title I and non-Title I schools grew to 19.1 points in 2021 and continued to grow to 20.2 points by spring 2022.

**Math Score Gaps Between Title I and Non-Title I Schools**

Scale score gap by Year:
- 2017: −18.4
- 2018: −18.2
- 2019: −16.9
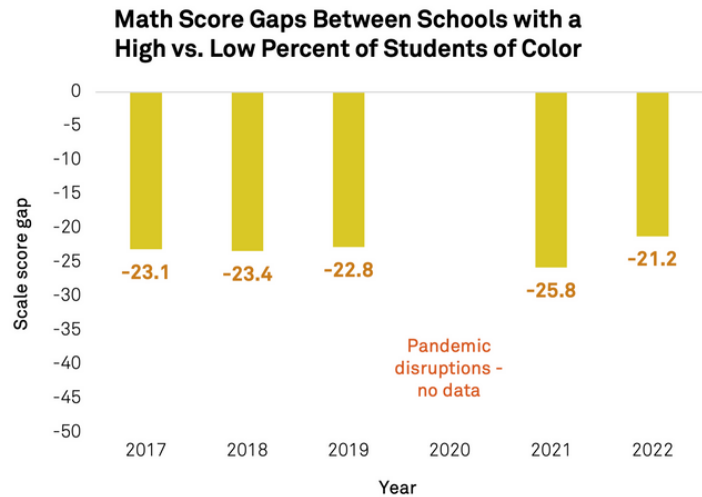- 2020: Pandemic disruptions - no data
- 2021: −19.1
- 2022: −20.2
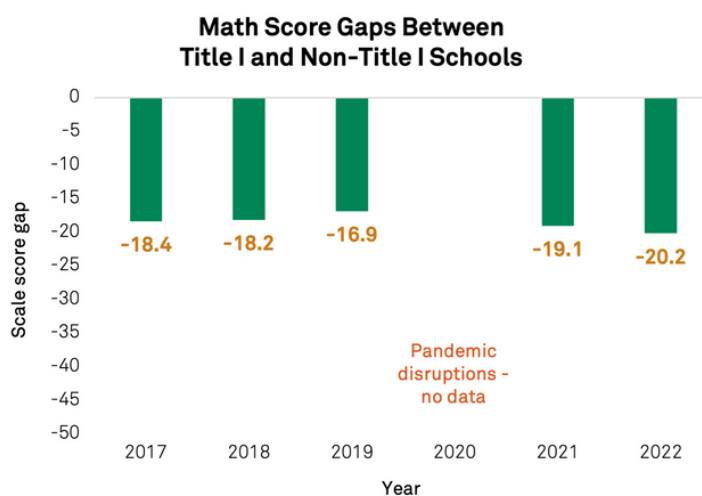
For upper elementary grades, the average math score gaps between schools with the highest and lowest proportions of students of color had been steadily improving. In 2019, schools with the highest proportion of students of color scored 17 points below schools with the lowest proportion of students of color, a rough equivalent of 18 weeks of learning for third graders, 23 weeks of learning for fourth graders, and 26 weeks of learning for fifth graders. By 2021, the gap had grown to 23 scale score points and improved slightly to 20.5 in 2022.

**Math Score Gaps Between Schools with a High vs. Low Percent of Students of Color**

Scale score gap by Year:
- 2017: −18.1
- 2018: −17.4
- 2019: −17.1
- 2020: Pandemic disruptions - no data
- 2021: −22.9
- 2022: −20.5

## Middle: Grades 6-8

At the middle grade level, the gaps between Title I and non-Title I schools ranged from 16 to 17.9 in the years prior to the onset of the pandemic. As with the previous grade groups, we see the gap between low- and high-income schools had been narrowing in the previous years. Between 2017 and 2019, the size of the gaps had shrunk from 17.9 points to 16 points. This pre-pandemic income gap roughly translates to 35.8 weeks of learning for sixth graders, 44.9 weeks of learning for seventh graders, and 42.7 weeks of learning for eighth graders. However, in the first full year after the onset of the pandemic, the gap grew back to 17.4 in 2021 and 17.9 in 2022, erasing the modest gains that had been made before the pandemic.

In the middle grades, we see the gap between schools with the highest and lowest proportions of students of color increase from 22.8 in 2019 to 25.8 in 2021. In other words, the pre-pandemic gap by racial composition translated to roughly 49 weeks of learning for sixth graders, 64 weeks of learning for seventh graders, and 65 weeks of learning for eighth graders. Compared to the other grade groups, though middle grade students exhibited some of the bigger gaps, they also demonstrated the most improvement. As with the other grades, the gap is reduced—and even lower—in 2022 than in all the previous years in our sample. This again points to substantial improvement in math for schools with the largest proportions of students of color.

### Math Score Gaps Between Title I and Non-Title I Status Schools

Scale score gap vs. Year

- 2017: −17.9
- 2018: −16.8
- 2019: −16
- 2020: Pandemic disruptions - no data
- 2021: −17.4
- 2022: −17.9

### Math Score Gaps Between Schools with a High vs. Low Percent of Students of Color

Scale score gap vs. Year

- 2017: −23.1
- 2018: −23.4
- 2019: −22.8
- 2020: Pandemic disruptions - no data
- 2021: −25.8
- 2022: −21.2
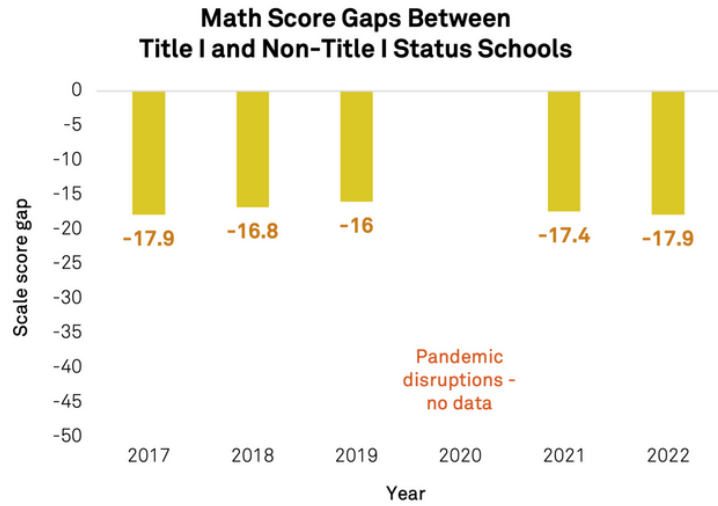
## 06 Conclusion

Following the onset of the pandemic, millions of children and families across the country experienced unprecedented disruptions to their everyday lives, including schooling and learning. With this brief, we add to the growing body of work that highlights the immediate impacts of the pandemic on student test scores and explore the extent to which these disruptions exacerbated existing gaps in achievement by both race and income.

In line with prior studies, we find evidence of a decline in student performance in both reading and math. On average, students in first through eighth grades fell or remained below grade-level standards and many have not recovered to pre-pandemic levels as of 2022. More remarkable, however, is the fact that learning gaps by race and income in years preceding the pandemic were several magnitudes larger than even the greatest declines in learning after the pandemic. This point is worth emphasizing because it underscores what educators already know: the impacts of the pandemic were not uniform across schools, and in some cases, it merely brought to the surface systemic inequities that warranted the attention and policy efforts seen now in response to the COVID crisis.

For example, between 2019 and 2021, average scores in third through fifth grade saw a decline equivalent to roughly five weeks of learning in reading and 13 weeks in math. However, if we use this same conversion of score differences to learning time in 2019, before the pandemic, average reading scores in schools serving majority students of color were behind scores in schools serving majority white students by more than a year. We see a similar but less stark difference in math achievement.

**While the onset of the pandemic correlates with declines in achievement between 2019 and 2022, these declines are overshadowed by score differences along race and class lines that were present before the public health crisis ever began.**

These comparisons pose a crucial question for educators, school administrators, and policymakers: What should the country's educational "recovery" look like? What is—or should be—the goal for US public schools in the coming years? If we "get back to normal," we reinforce the pre-existing inequalities. Yet attempting to get every student on grade level—when some are estimated to be many months (or years) behind—poses its own set of practical challenges.

With so much attention being paid to K-12 schools in the wake of the pandemic, we have a unique opportunity to re-envision education: how we deliver instruction, how we define and measure achievement, and the degree to which we invest in public schools. The effects of the pandemic will likely be felt for generations to come. As we work to recover and then improve in this stage of the pandemic and beyond, sustaining the current level of investment in education and implementing comprehensive policies that will target resources to those in most need will be critical for a healthy and inclusive recovery.

# Let us know

If you're a school-based educator, central office administrator, education researcher, or other K-8 education stakeholder…

- How do you interpret these findings?

- What questions do you have?

- What other data or analyses would you like to see?

- What interventions do you believe are most urgently needed (at your school or in general) to reverse pandemic-related learning loss?

- What are some barriers to implementing these interventions?

- What support and resources do school districts and educational practitioners need to help their students?

**Get in touch at e4center@northwestern.edu and on Twitter at @E4Center_NU.**

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