

Missouri's 2022 NAEP Scores: Decades of Achievement Gains Erased, Unprecedented Achievement Gaps

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Better evidence, better policies, better schools.

Key Points

The National Center for Education Statistics (NCES) recently released the 2022 NAEP results. This no-stakes assessment measures the national and individual state performance of 4th and 8th grade students in reading and math. NAEP is administered to a representative sample of students from each state, allowing it to serve as a standard measure of student performance across states and time. This policy brief examines Missouri's 2022 NAEP results, which are the first look into NAEP performance after the pandemic. We focus on Missouri's performance changes over time, gaps between student groups, and comparison to national trends. We find:

1. Missouri's student performance on NAEP 4th and 8th grade math and reading assessments saw unprecedented declines from 2019 to 2022; 2022 scores are the lowest in decades.
 - a. Missouri's 4th grade NAEP math and reading scores lag behind border states.
 - b. Missouri's 8th grade NAEP score declines in math and reading mirror national trends.
2. Missouri has fewer NAEP Proficient or Advanced students than in prior years and lags behind the majority of other states and the national average.
 - a. Approximately two of five Missouri students are Below Basic in 4th Grade Reading and 8th Grade Math.
 - b. Slightly less than one in four (24%) Missouri's 8th graders achieved proficient or advanced on the NAEP math assessment.
3. Missouri's achievement gaps, by race and family socioeconomic status, widened during the pandemic with most reaching unprecedented score gaps.



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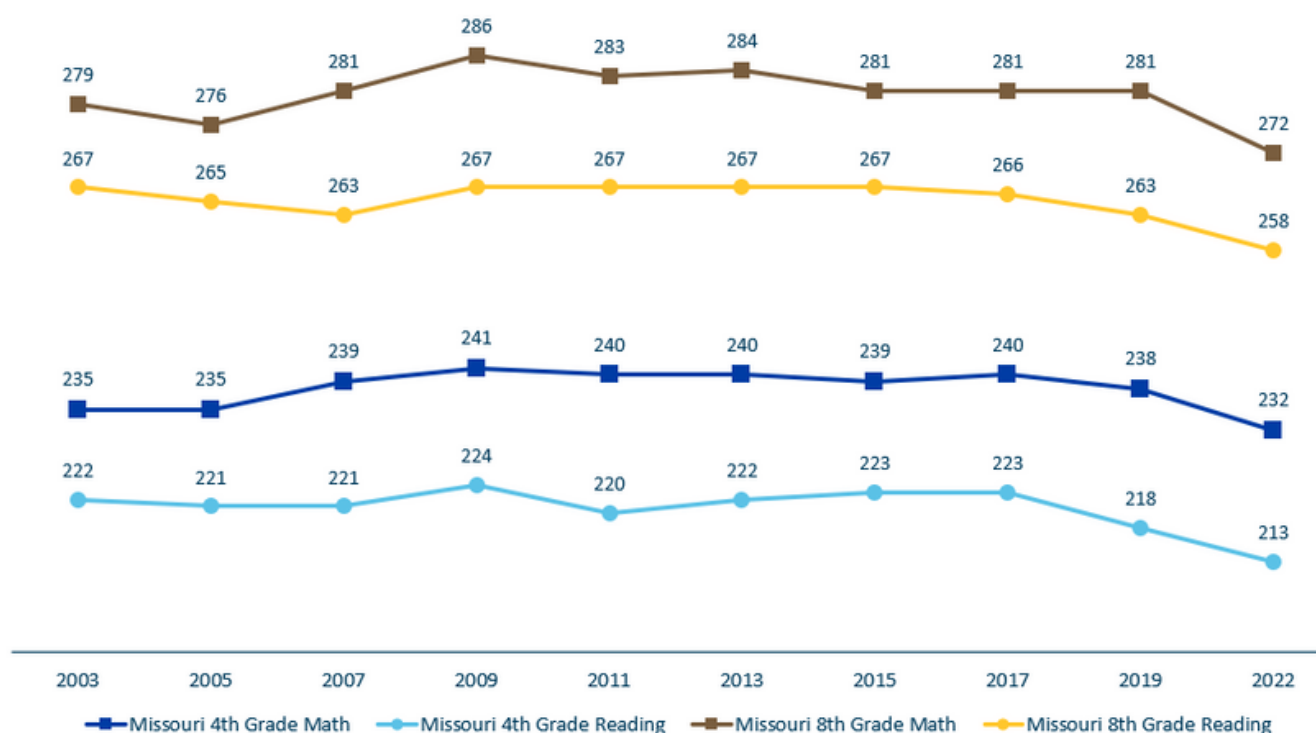
Introduction

The National Assessment of Educational Progress (NAEP), often referred to as the “Nation’s Report Card,” is the largest nationally representative and continuous assessment of public and private school students. Normally administered every two years, the 2021 iteration of the assessment was delayed until 2022 due to the COVID-19 pandemic. Administered through a congressional mandate, NAEP provides a common measure of student achievement in 4th and 8th grade, across the nation and in each state, in subjects including mathematics and reading, among others. NAEP results are reported as scale scores, ranging from 0-500, and cannot be compared across subjects or grades. These results are aggregated to the national, state, and—in some cases—district level but cannot be tied back to individual schools, teachers, or students. Unlike most K-12 standardized assessments, state-by-state and across-state comparisons are possible and results are reported by race/ethnicity, gender, and Free and Reduced-Price Lunch (FRL) eligibility, making NAEP an important tool for education stakeholders to increase student achievement and inform education policy decisions.

Missouri’s Statewide NAEP Results: Lowest in 20 Years

The 2022 NAEP results indicate Missouri’s scores¹ dropped significantly in 2022 from 2019, with declines ranging from five to nine scale score points (Figure 1). At present, scores are the lowest they have been in 20 years, representing an unprecedented decline in student achievement likely as a result of the COVID-19 pandemic.

Figure 1 : Missouri NAEP Scores, 2003-2022

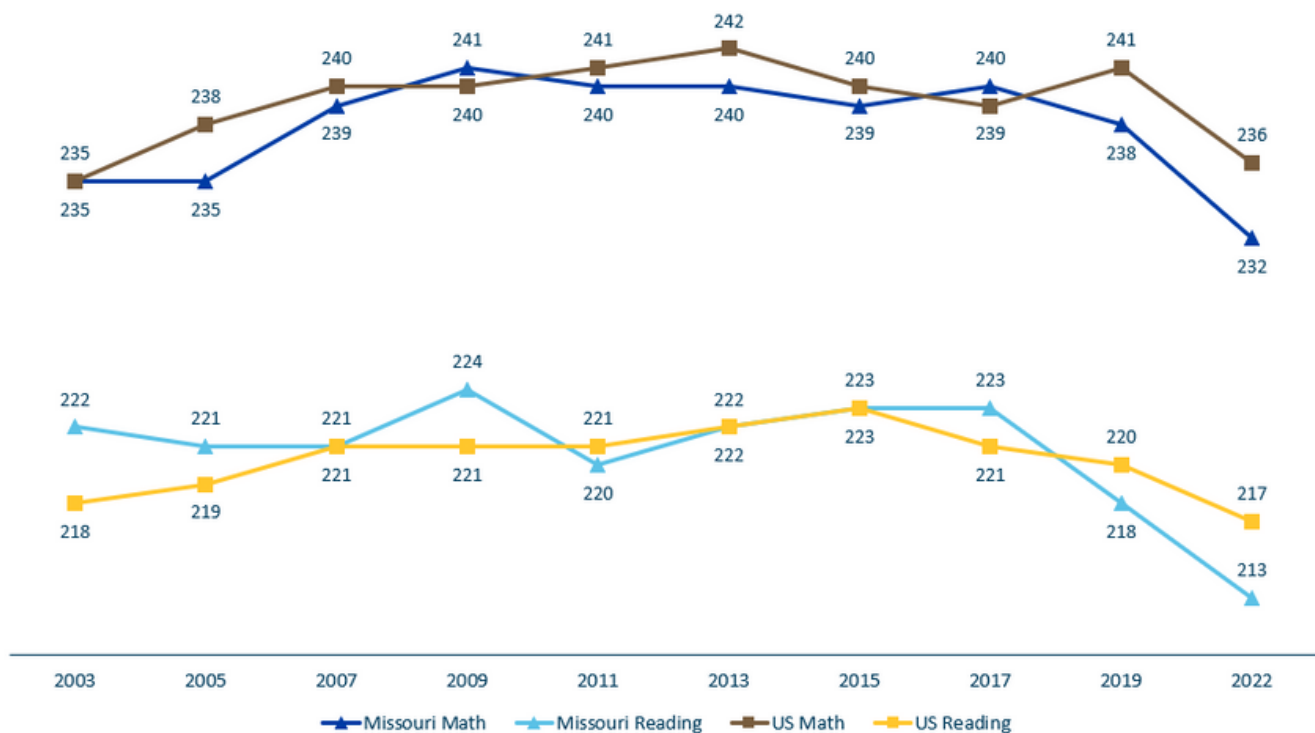


¹ For simplicity, we use "scores" to represent mean scale scores.

Missouri's 4th grade NAEP math and reading scores lag behind border states

Missouri's 4th grade math scores (232) are similar to the national average (Figure 2). Both declined between 2019 and 2022 at similar rates, by six and five scale score points, respectively. Notably, Missouri's 4th grade math scores previously declined by two points between 2017 and 2019, after being relatively stable between 2009 and 2017. Present scores are similar to those seen in 2003 when Missouri's average scale scores were 235, highlighting the recent erasure of score gains over the course of the last two decades.

Figure 2 : 4th Grade NAEP Scores, Missouri and US, 2022



Missouri students' scale scores in 4th grade reading are 213, representing a decline of five scale score points since 2019 which is on par with national-level scores and rate of decline. Contrary to the improvement observed with 4th grade math scores prior to 2019, reading scores had remained relatively stable between 2003–2017. However, reading scores declined drastically between 2017–2022; at present, 4th grade reading scores are the lowest in decades, similar to scores in 1992. Because reading is an essential skill, foundational for learning in other subject areas, this is a particularly troublesome finding.

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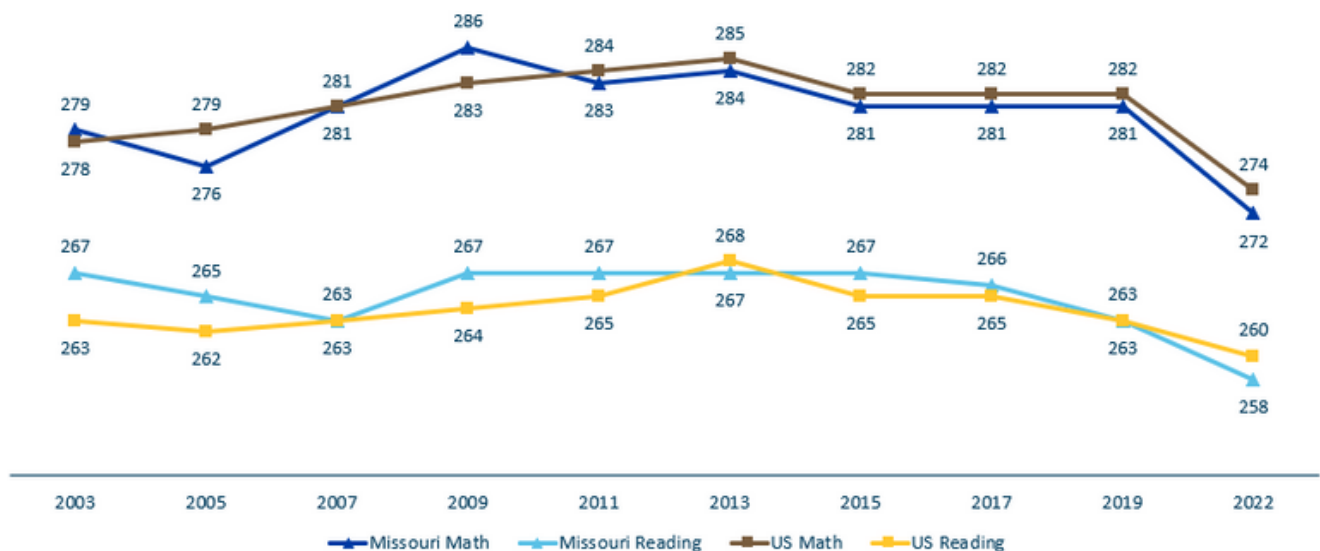
As compared to border states (Table 1), Missouri's 4th grade math and reading scores lag behind six of eight border states. In math, the lowest performing neighbor state was Arkansas with an average score of 228, while the highest performing neighbor state was Nebraska at 242. In reading, Oklahoma had the lowest average score at 208 while Nebraska, again, had the highest at 219.

Table 1 : 2022 4th Grade NAEP Scores, Missouri, US, and Border States			
4th Grade Math		4th Grade Reading	
National Avg	236	National Avg	217
Border State Avg	235	Border State Avg	215
Nebraska	242	Nebraska	219
Iowa	240	Iowa	218
Illinois	237	Illinois	218
Tennessee	236	Kentucky	217
Kansas	235	Kansas	215
Kentucky	234	Tennessee	214
Missouri	232	Missouri	213
Oklahoma	229	Arkansas	212
Arkansas	228	Oklahoma	208

Missouri's 8th grade NAEP score declines in math and reading mirror national trends

As demonstrated in Figure 3, 8th grade math scores declined substantially between 2019 and 2022 for Missouri students. The decline was almost identical to that of the rest of the United States. This decline essentially brought Missouri back to its 1992 achievement level when the average score from the state was 271. Missouri's score reduction of nine points to 272 was only slightly larger than the national decline of eight points to 274.

Figure 3 : 8th Grade NAEP Scale Scores, Missouri and US, 2022



Missouri's 2022 NAEP Scores

Missouri 8th grade reading scores (258) were negligibly lower than the national average (260). However, this similarity should not mask the substantial decline in reading scores for both Missouri and the United States between 2019 and 2022 of five and three points, respectively. This decline returns both Missouri and national scores to their lowest point since 1998.

Compared to border states, the performance of Missouri’s 8th graders in math and reading was the same or better than five border states (Table 2). The lowest border state math scale score was 264 for Oklahoma and the highest scale score was 279 for Nebraska. For reading performance, Missouri’s result of 258 was in between the low of 251 in Oklahoma and the high of 262 in Illinois.

Table 2 : 2022 8th Grade NAEP Scores, Missouri, US, and Border States			
8th Grade Math		8th Grade Reading	
National Avg	274	National Avg	260
Border State Avg	272	Border State Avg	258
Nebraska	279	Illinois	262
Iowa	277	Iowa	260
Illinois	275	Nebraska	259
Missouri	272	Missouri	258
Kansas	272	Tennessee	258
Tennessee	272	Kentucky	258
Kentucky	269	Kansas	256
Arkansas	267	Arkansas	255
Oklahoma	264	Oklahoma	251

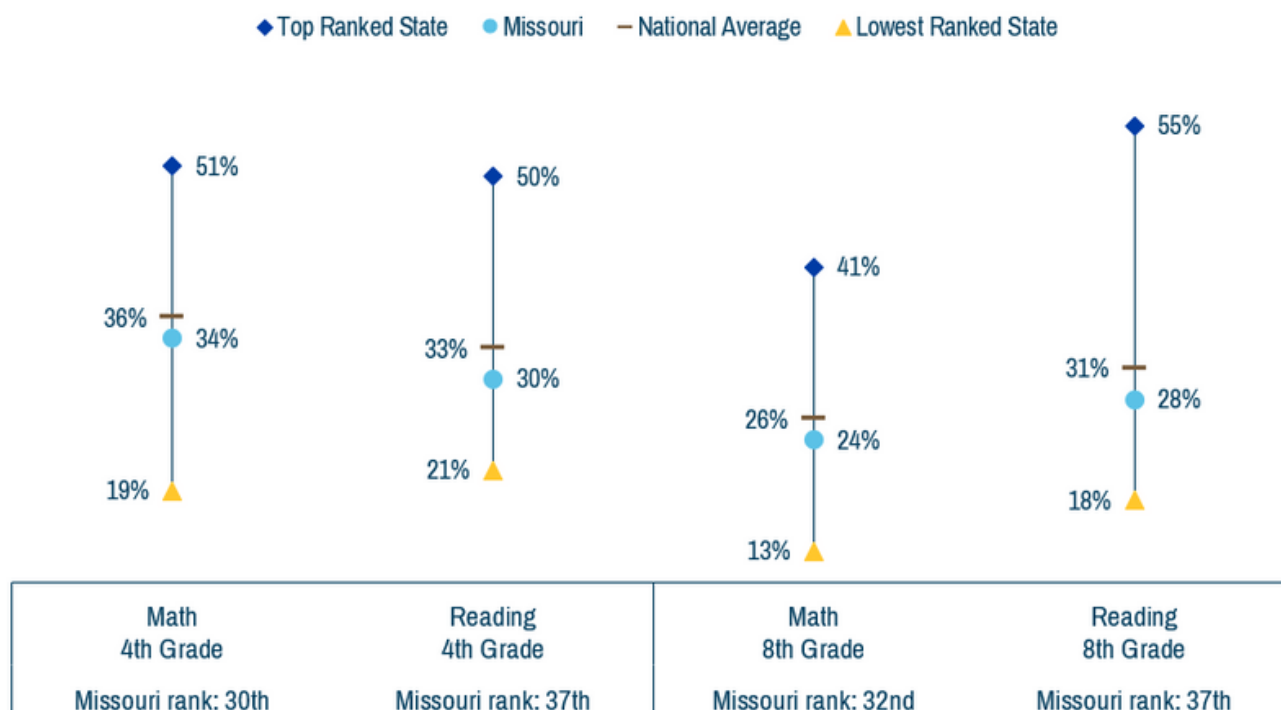
Missouri has Fewer NAEP Proficient or Advanced Students than in Prior Years

There are four levels of student achievement recognized by NAEP: Advanced, Proficient, Basic, and Below Basic. NAEP Proficient is arguably the most important category as this is essentially the target level of academic achievement. Specifically, the percentage of students who are NAEP Proficient represents the percentage of students who have an appropriate grasp of the relevant subject matter. However, unlike results from state-level assessments like MAP, NAEP Proficient does not represent grade-level proficiency. As such, NAEP Proficient cannot be interpreted as students who are performing at grade-level proficiency, but can rather be interpreted as students who have achieved a comprehensive proficiency in a specific subject matter unrelated to specific grade-level benchmarks.

NAEP Proficient is the target level of achievement as it represents the percentage of students who have an appropriate grasp of the relevant subject matter.

The percentage of Missouri students who are NAEP proficient or advanced ranges from 24% to 34% depending on grade and subject matter (Figure 4). Missouri consistently ranks below the national average and no higher than 30th compared to the other states in the nation. This indicates that Missouri, comparatively, is underperforming in preparing students to achieve competency in mathematics and reading.

Figure 4 : Percent of NAEP Students Scoring Proficient & Advanced, 2022

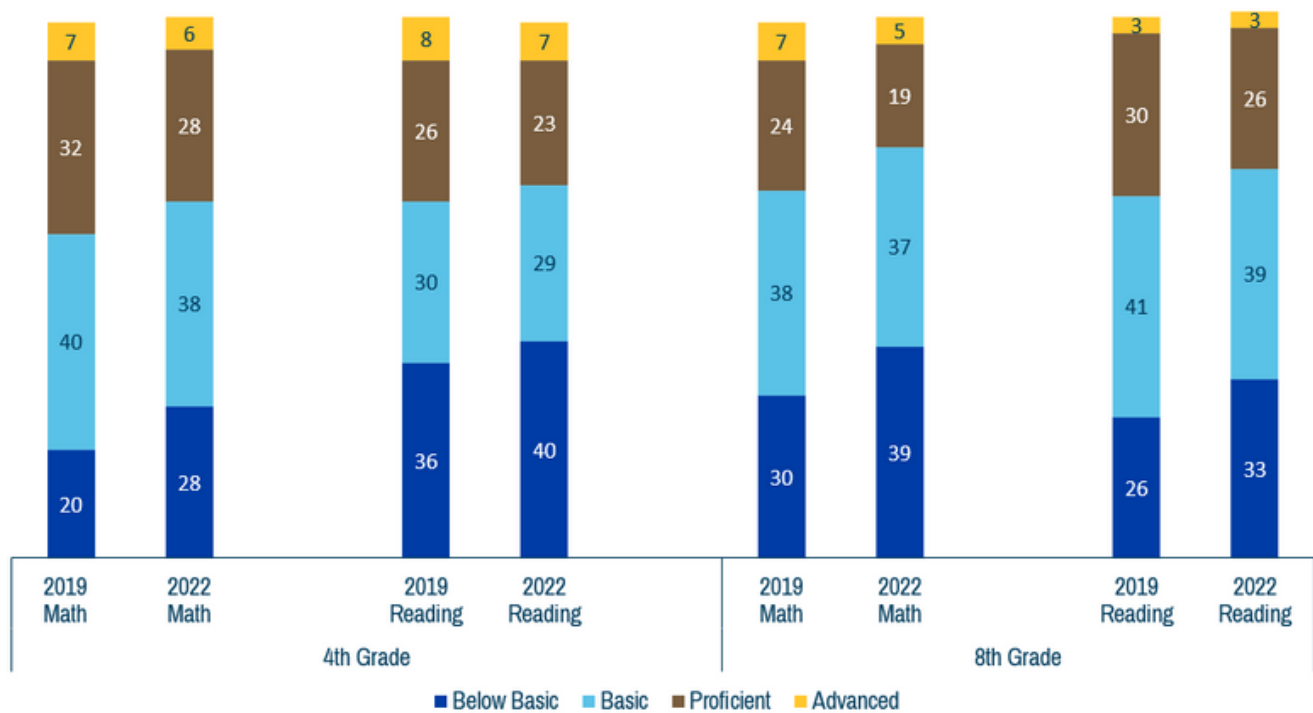


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Less than one in four (24%) Missouri 8th grade students achieved NAEP Proficient or Advanced in math

In addition to the comparatively below average proficiency results for the 2022 iteration of the NAEP assessment, the decline in the percentage of Missouri students who achieved proficient or advanced demonstrates the devastating impact of the COVID-19 pandemic on student achievement. As illustrated in Figure 5, the proportion of 4th and 8th grade students who achieved NAEP Proficient or Advanced status declined in both subjects between 2019 and 2022, with declines ranging from four to seven percentage points. Importantly, less than one in four (24%) 8th grade students achieved proficient or advanced in math.

Figure 5 : Missouri's Math and Reading Scores, by Achievement Level, 2019–2022



Approximately two of five Missouri students are Below Basic in 4th grade reading and 8th grade math

Notably, as the proportion of NAEP Proficient or Advanced students declined, the proportion of those who achieved below basic increased in all four categories while the proportion of students achieving basic results remained relatively unchanged. In 4th and 8th grade for both subjects, the proportion of students scoring in the below basic category increased by between four and nine percentage points. This shift is most apparent when looking at 8th grade math results. From 2019 to 2022, the proportion of 8th graders achieving at the below basic level on the math exam increased by nine points to 39 from 30. Thus, at present, two in every five Missouri students achieved below basic in 8th grade math. This uncovers a disturbing trend: more students are achieving unsatisfactory results on the NAEP assessment while fewer students are demonstrating a substantive grasp of the subject matter. As a result, schools are likely experiencing a larger remedial instruction burden.

Achievement Gaps Widened During the Pandemic

Missouri students are demographically somewhat different than students from the rest of the United States (Table 3). Missouri students are, on average, substantially more likely to be White (71%) compared to the United States (48%). Additionally, while the percentage of Black students is roughly on par with the rest of the country, the percentage of Hispanic residents (6%) is substantially less than the national average (27%). However, Missouri students are, on average, equally likely as the rest of the United States to be eligible for the Free and Reduced-Price Lunch (FRL) program (52%). Notably, FRL is used as a proxy for family poverty.

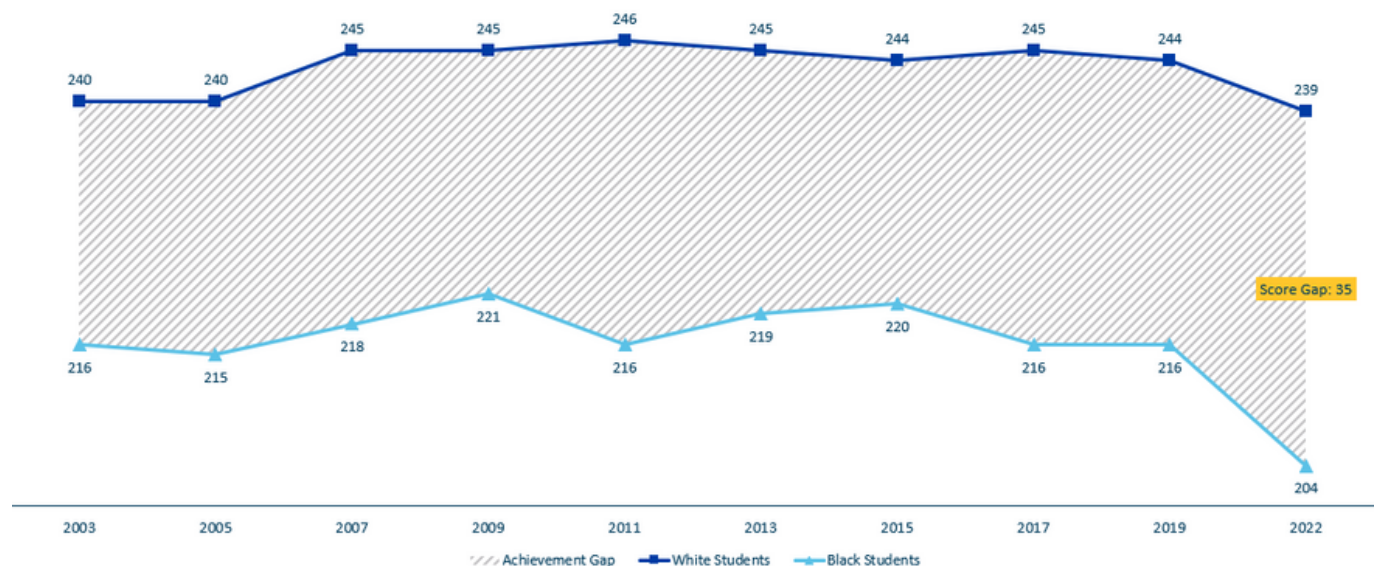
Table 3 : Demographics, Missouri and US					
	White	Black	Hispanic	Other Races	FRL-eligible
Missouri	71%	16%	6%	7%	52%
United States	48%	15%	27%	11%	52%

While we see an overall decline in NAEP performance after the pandemic, findings are even more troubling for specific student groups. In recent years, achievement gaps by race and family socioeconomic status have widened for 4th and 8th graders in math and reading. Missouri's student body consists of individuals from a variety of racial/ethnic backgrounds; we report trends in achievement gaps between White and Black students because they represent the largest racial groups in the state (71% and 16%, respectively).

Pandemic-related drops in scores were more pronounced for Black students than for White students

As shown in Figure 6, Black 4th graders had lower math achievement than their White peers from 2003 to 2022. While White students experienced an unprecedented decline in 4th grade math scores from 244 in 2019 to 239 in 2022, their scores were not much lower than seen in 2003 (240). Pandemic-related drops in scores were much more pronounced for Black students. In fact, the 4th grade math score gap between White and Black students was 35 points in 2022 (up from a 28 point gap in 2019), and Black students' math scores (204) dropped well below any level seen since 2003. This score gap between White and Black 4th grade students is the largest math difference ever recorded by the NAEP in Missouri.

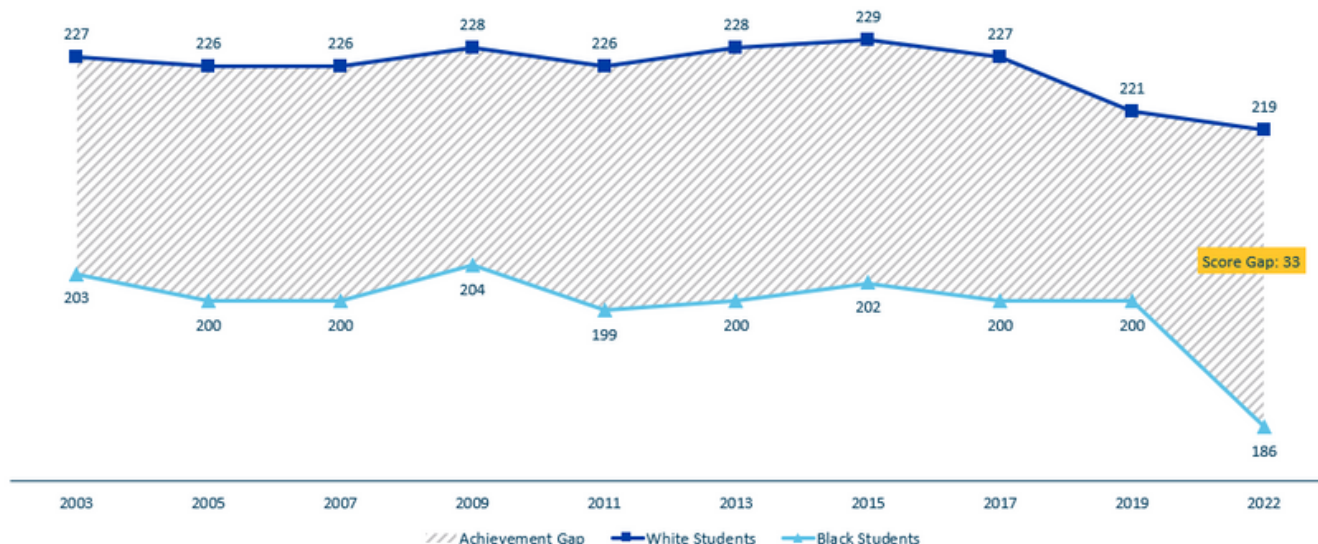
Figure 6 : NAEP 4th Grade Math Scores, White and Black Students, 2003 to 2022



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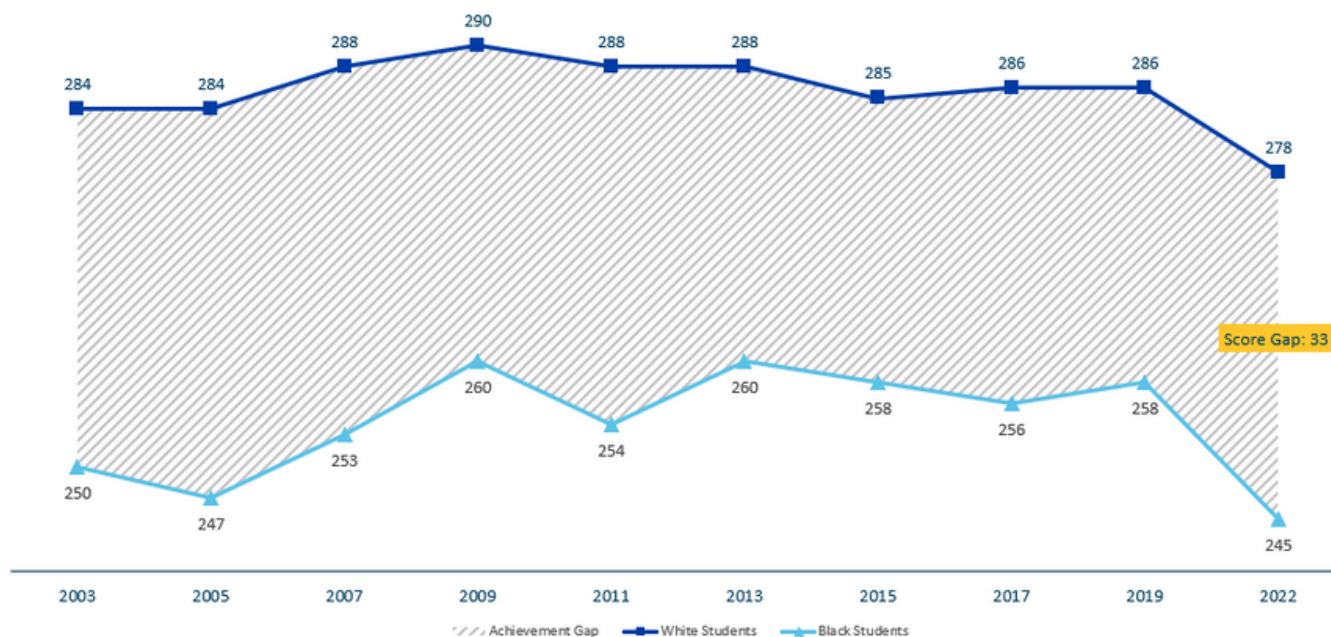
We see a similar story for 4th grade reading scores (Figure 7). White 4th graders, who had experienced a score drop from 227 in 2017 to 221 in 2019, saw a minimal reading score decline (2 point drop) during the pandemic. Black students were much more impacted by the pandemic, experiencing a 14 point decline from 2019 to 2022. The score gap between White and Black students in 2022 is 33 points; prior to this year, the largest gap was a 28 point difference in 2013.

Figure 7 : NAEP 4th Grade Reading Scores, White and Black Students, 2003 to 2022



The achievement gap between White and Black 8th graders has also widened (Figure 8). Historically, the 8th grade math achievement gap has been the largest compared to other subjects and across grade levels, showing already disturbing inequities in achievement that were exacerbated by the pandemic. White students experienced an 8 point drop in scale scores from 2019 to 2022, but Black students experienced a 13 point drop, resulting in a score gap of 33 points. Notably, the math score gap between White and Black 8th graders had not been this large since 2011 (34).

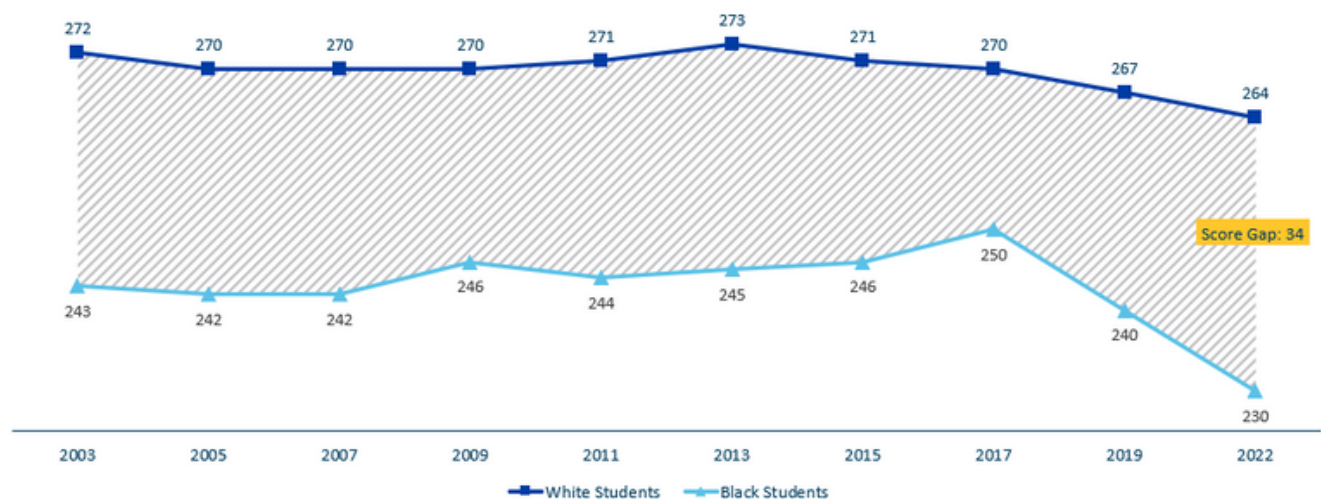
Figure 8 : NAEP 8th Grade Math Scores, White and Black Students, 2003 to 2022



Historically, the 8th grade math achievement gap has been the largest compared to other subjects and across grade levels. Notably, the math score gap between White and Black 8th graders had not been this large in math (34) since 2011.

In reading, we observed that White 8th graders had been experiencing a decline in scores even prior to the pandemic, but Black students' scores had gradually increased through 2017 (Figure 9). Unfortunately, starting in 2017 and continuing through the pandemic, this pattern of narrowing the achievement gap was reversed. While White students only experienced a three point decline in 8th grade reading scores from 2019 to 2022, Black students experienced a 10 point decline. The resulting 8th grade math score gap (34) is larger than seen in any other year during the observed time period.

Figure 9 : NAEP 8th Grade Reading Scores, White and Black Students, 2003 to 2022

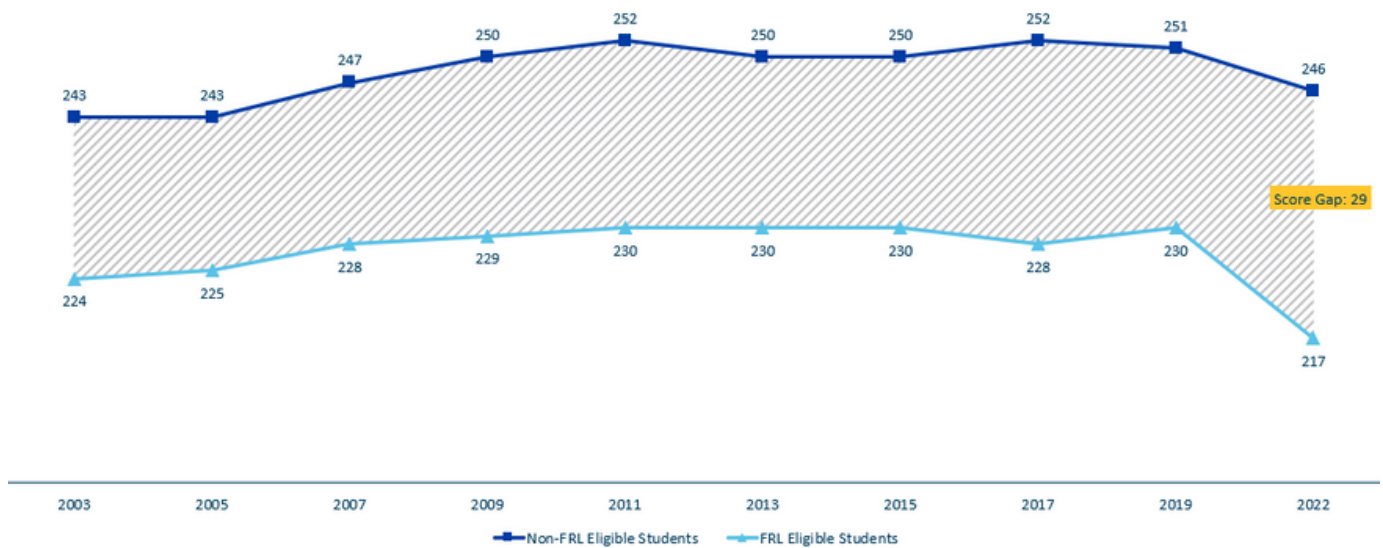


Pandemic-related score declines were more pronounced for FRL-eligible students than FRL-ineligible students

When looking at the achievement gap by family socioeconomic status, we see that achievement gaps between students who are FRL-eligible (more economically disadvantaged) and FRL-ineligible students were historically not as pronounced as achievement gaps by race. Still, FRL-eligible students typically score lower than their more economically advantaged peers. As shown in Figure 10, between 2003–2019, FRL-eligible 4th graders scored 18–24 points lower in math than their FRL-ineligible peers. In 2022, this gap widened to 29 points.

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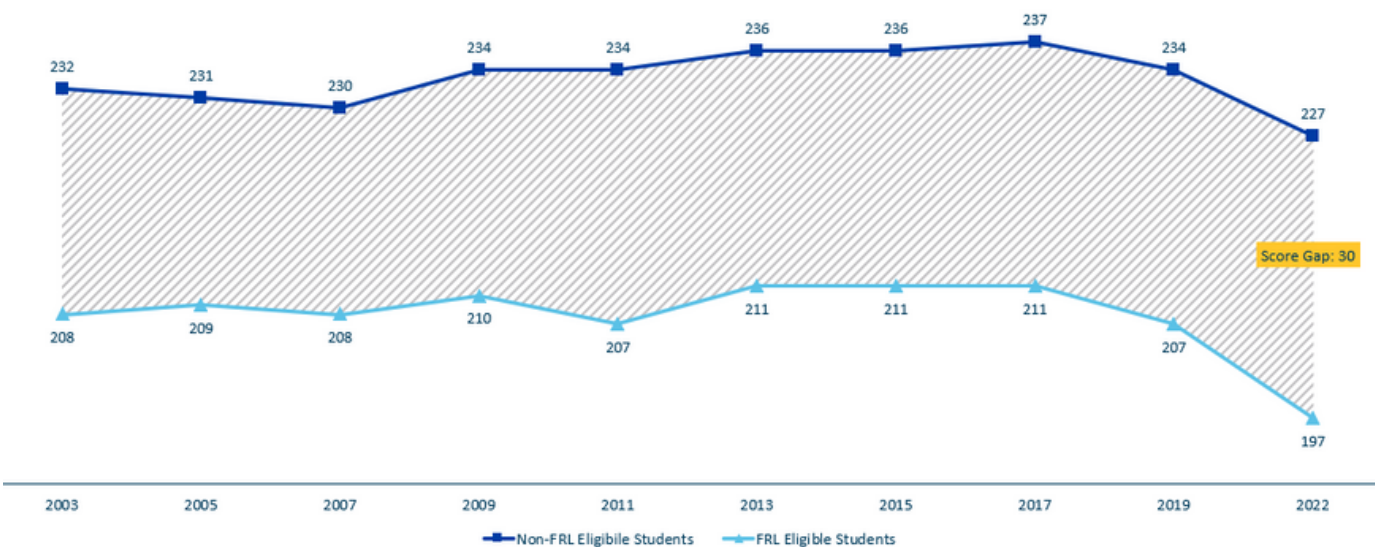
Figure 10 : NAEP 4th Grade Math Scores, FRL-eligible and FRL-ineligible Students, 2003 to 2022



Between 2003–2019, FRL-eligible 4th graders scored 18–24 points lower in math than their FRL-ineligible peers. In 2022, this gap widened to 29 points.

Figure 11 shows the 4th grade reading score gaps based on FRL-eligibility from 2003 to 2022. FRL-eligible 4th graders typically scored between 22 and 27 points lower than their more economically advantaged classmates. In 2022, economically advantaged 4th graders scored 30 points higher than their less advantaged peers.

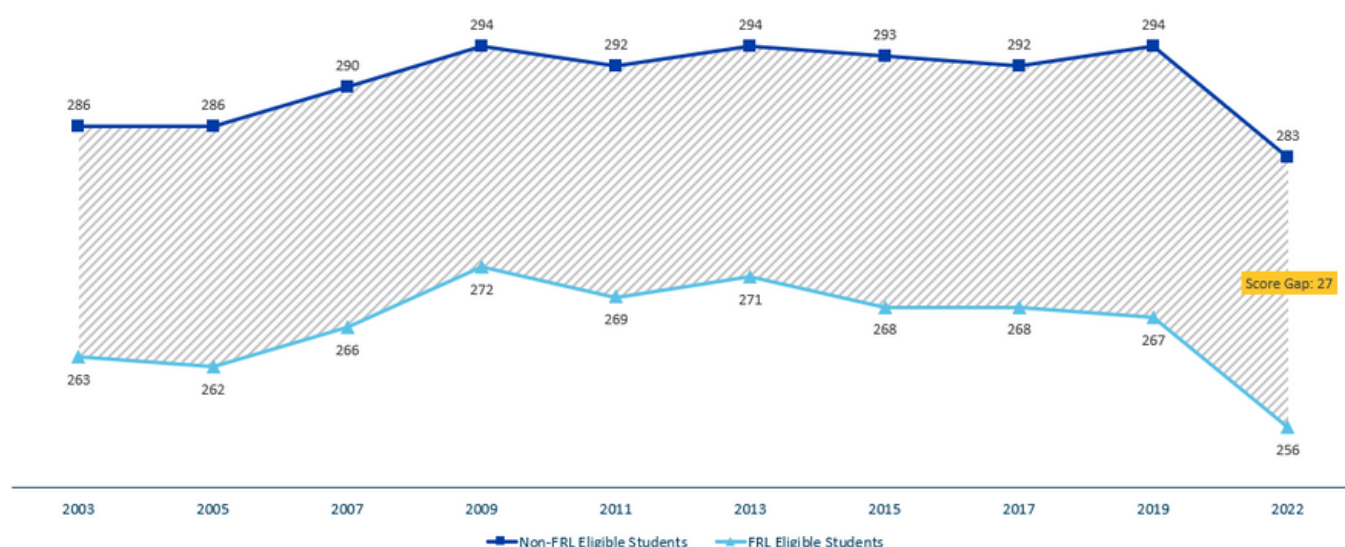
Figure 11 : NAEP 4th Grade Reading Scores, FRL-eligible and FRL-ineligible Students, 2003 to 2022



In 2022, economically advantaged 4th graders scored 30 points higher than their less advantaged peers in reading.

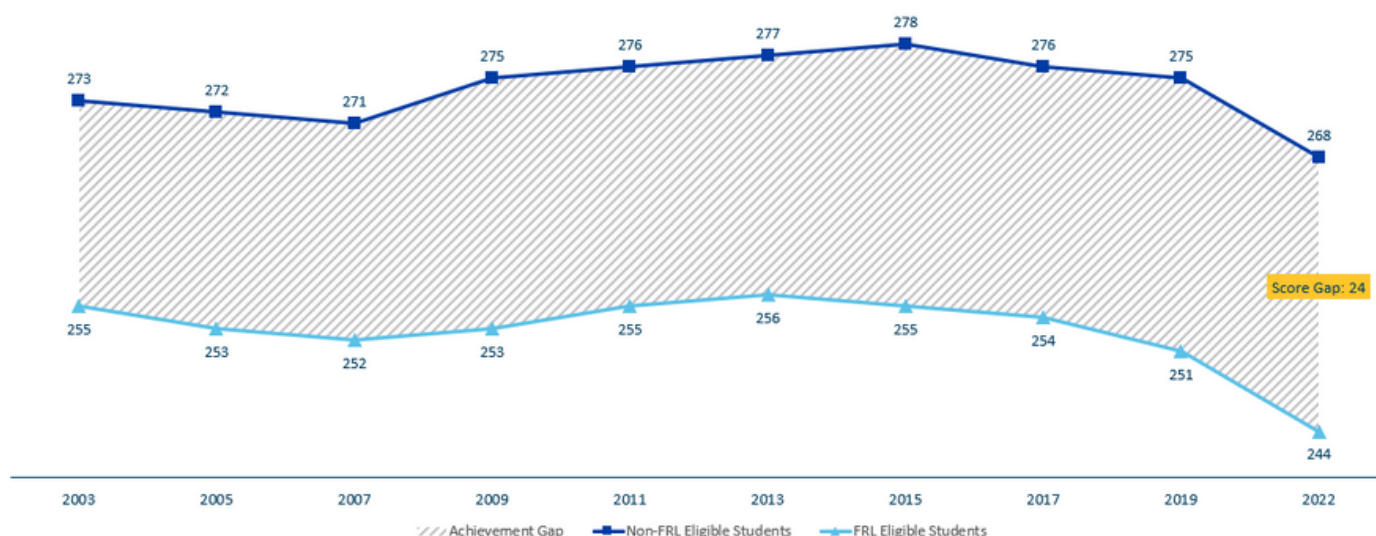
The achievement gap by family socioeconomic status was less stark for 8th graders than 4th graders. Between 2003–2022, economically disadvantaged 8th graders scored between 22 and 27 points lower in math (Figure 12). Because both FRL-eligible and FRL-ineligible 8th graders saw math score declines of 10 points in 2022, the 2022 score gap remained the same as in 2019.

Figure 12 : NAEP 8th Grade Math Scores, FRL-eligible and FRL-ineligible Students, 2003 to 2022



Achievement gaps by family socioeconomic status on 8th grade reading scores followed a concerning pattern. From 2003–2019, the achievement gap between FRL-eligible and FRL-ineligible 8th graders had been gradually increasing (from 18 to 24 points; Figure 13). Similarly to what we observed with 8th grade math scores, FRL-eligible and FRL-ineligible students experienced the same rate of decline from 2019 to 2022, so the achievement gap in 2022 remained the same (24 points) as in 2019.

Figure 13 : NAEP 8th Grade Reading Scores, FRL-eligible and FRL-ineligible Students, 2003 to 2022



Conclusion

While the results of the NAEP exam carry no consequences for the state, it is a metric to compare Missouri's achievement to the rest of the nation. In general, Missouri is performing on par with the rest of the country. However, the general decline in performance and the gaps in achievement for student groups show there is work to do across the state to ensure all students are being adequately academically prepared. Essentially, the pandemic has erased decades of student achievement gains for all students and exacerbated achievement gaps between subgroups (Black/White and by socioeconomic status). Our findings that 8th grade scores have declined are particularly concerning as it indicates that many of our students are entering high school underprepared. Without targeted supports to catch students up, we are likely to see a long-term impact on students' college and career readiness. We especially encourage school leaders to investigate the structural barriers that may contribute to the unequal effects of the pandemic on student achievement and ensure resources to "catch students up" are allocated accordingly.

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