Curriculum Associates® RESEARCH

STATE OF STUDENT LEARNING IN 2024

Reading and Mathematics Annual Report: August 2024

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SUMMARY

Following the fourth school year since initial school closures in March 2020, academic recovery at the national level remains stagnant. Yet, current and prior research identify disparate patterns in academic growth. As COVID-19 relief funds expire, it is critical to gain clear and accurate assessments of student achievement, determining what these varied growth patterns mean for grade-level attainment. The latest research from Curriculum Associates on the state of student learning in 2024 leverages a nationally representative sample to accurately speak to trends in the nation while offering insight into variation in these trends by school and student characteristics. Results, based on the *i-Ready Diagnostic* assessment, reveal limited progress toward pre-pandemic levels of achievement nationally, but small pockets in which specific groups challenge these trends. These data prompt a continued need to evaluate student performance from a nuanced and individualized lens, acknowledging there is not one global picture of recovery but varied experiences by student and school groups.

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INTRODUCTION

Four years after its onset, the impact of the COVID-19 pandemic on educational achievement persists. Student academic achievement remains behind pre-pandemic trends with limited evidence of recovery (Curriculum Associates, 2023a; Young & Young, 2024a; Lewis & Kuhfeld, 2024; US Department of Education, 2023). In fact, recent work shows that, in some cases, students are growing at a slower rate than similar students historically. In other cases, students are demonstrating comparable growth but entering school less prepared. With lower scores at school entry and equivalent growth, students are not making up lost ground, potentially exacerbating gaps in learning caused from pandemic-related disruptions (Young & Young, 2024a; 2024b). To contextualize these differences, it is necessary to understand what this varied growth means for student achievement relative to a stable benchmark. Are fewer students reaching grade-level standards as a result of these shifted growth trajectories?

Previous releases of this report identified substantial declines in the percentage of students achieving grade-level placement immediately post-pandemic and slow academic recovery in the years since (Curriculum Associates, 2021; 2022; 2023a). This year's data show similar trends to those seen in spring 2023, with only small increases in grade-level students in particular areas. Stagnant recovery nationally in tandem with varying patterns by students and schools provides further evidence of uneven academic recovery and a continued need for nuanced and data-driven approaches for assessing recovery.

This report is our latest research on achievement among students in Grades K-8 who took the *i-Ready Diagnostic* for Reading and for Mathematics. The *i-Ready Diagnostic* was taken by approximately 13 million students in the 2023-2024 school year. This analysis is a comprehensive look at student achievement in the 2023-2024 school year, compared to 2022–2023, 2021–2022, and one year prior to the pandemic. We examine student grade-level achievement, fall-to-spring growth in scale score points, and student achievement in subject-specific domains to provide a deeper look at progress in reading and mathematics.

To provide an accurate snapshot of national performance, we created a nationally representative sample on key characteristics impacting achievement. Leveraging a nationally representative sample allows for: 1) trends that are representative of the nation and valid for making claims about national trends and 2) results disaggregated by these key characteristics—features not afforded by other sampling techniques. The total size of the nationally representative samples includes 10,471,920 students for reading and 12,000,140 students for mathematics (inclusive of all grades and school years).

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METHODS

Research Questions

1. By grade and subject, how does student achievement at the end of the 2023–,2024 school year compare to achievement in the years prior (i.e., 2021-2022, 2022–2023) and prior to the pandemic (i.e., 2018-2019)?

2. How does student achievement at the end of the 2023–2024 school year vary by the racial or ethnic makeup of schools and the median household income of schools' locations, and how does that compare to achievement in the years prior (i.e., 2021-2022, 2022–2023) and prior to the pandemic (i.e., 2018-2019)?

3. By grade and subject, how does fall-to-spring growth in the 2023-2024 school year compare to growth in the years prior (i.e., 2021-2022, 2022–2023) and prior to the pandemic (i.e., 2018-2019)?

4. By grade and subject, how does student achievement in subject-specific domains at the end of the 2023–2024 school year compare to achievement in the years prior (i.e., 2021-2022, 2022–2023) and prior to the pandemic (i.e., 2018-2019)?

Sampling Technique

To represent national trends in student performance, we created a nationally representative sample using a stratified sampling technique. Using data from the National Center for Education Statistics (NCES) and the US Census, we approximated the makeup of the US public school population based on region, locale, race/ethnicity, and median household income. This process involved three steps: (1) build a sampling frame of eligible students and schools, (2) set sampling targets to reflect the national public-school population, and (3) use stratified sampling to select a sample of schools that mimics the US population demographics.

To create a sampling frame, students were deemed eligible if they had completed a Diagnostic in the fall and spring testing windows, the Diagnostics were taken in English, and were not flagged for rushing. To identify eligible schools, we used schools with an established link between the *i-Ready* and NCES school IDs—more than 80% of the schools in *i-Ready*. To be included, schools had to have non-missing race/ethnicity, locale, and zip code data in NCES (US Department of Education, 2022). Additionally, we required the number of students in the sampling frame for a given school, subject, and grade level be between 75% and 150% of the NCES-reported enrollment for that school and grade level. This ensures the school-level demographic information could be used as a strong proxy for the demographics of those students in the sampling frame. Finally, the school zip code, as reported by NCES, had to have a matching row with the median annual household income from the US Census dataset (US Census Bureau, 2022).

To create the sampling targets (i.e., the demographic distribution of the target population), we calculated the percentage of Black, Hispanic, and White students as well as the percentage of students in each combination of geographic region (i.e., Northeast, Midwest, South, and West) and locale (i.e., City, Suburban, and Town/Rural) by grade level from the NCES data. Finally, we merged

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median annual household income data from the US Census with schools' zip codes to create median annual income averages.

The stratified sampling was conducted at the school level to select a sample of schools in which the frequencies of students in each of the demographic categories and the median household income matched within plus or minus five percentage points of the sampling targets. This was done as follows:

1. We compared the demographic distributions and median income of the sample against the sampling targets (starting with the sampling frame).

If the sampling criteria were not met:

2. We selected a stratified sample with the sample size equal to 98% of the sample from Step 1.

We repeated Steps 1 and 2 until we arrived at a sample in which the demographic distributions matched within plus or minus five percentage points of the sampling targets. In Grades 7 and 8, we could not select a sample within plus or minus five percentage points without losing a very large percentage of schools and students in the sample. To maintain sample size consistency across grade levels, we allowed region and locale to vary within plus or minus seven percentage points in Grades 7 and 8.

We repeated the sampling process 10 times (i.e., 10 iterations with different random seeds) per school year to select a total of 40 nationally representative samples per subject and grade level. After selecting the samples, we calculated the percentage of students who scored on grade level or above and the average spring scale score for each sample. Upon reviewing the results for the 10 iterations, we determined that the results were very consistent across the samples. The results reported represent unweighted averages across the 10 samples in each school year, subject, and grade level.

Sampling Description

The total sample included 12,000,140 students for mathematics and 10,471,920 students for reading across all grades and school years. Average sample sizes ranged from 90,171 to 775,048 across individual grade and subject samples. Table 1 lists the average sample size across the 10 samples and the percentage of the sampling frame included in these samples.

Table 1. Number and Percentage of Students in Sampling Frame and Sample by Year, Grade, and Subject

Grade	2018-2019		2021-2022		2022-2023		2023-2024	
	Sample *n*	% in Sample	Sample *n*	% in Sample	Sample *n*	% in Sample	Sample *n*	% in Sample
Reading								
K	90,171	41.2%	263,841	60.4%	351,865	90.2%	337,035	82.2%
1	180,472	48.1%	360,789	67.3%	542,556	94.5%	578,499	91.5%
2	214,471	49.3%	551,471	94.7%	512,450	95.2%	639,586	92.1%
3	188,587	42.1%	583,217	92.9%	579,742	93.8%	614,366	91.5%
4	293,585	65.7%	541,192	92.6%	559,850	93.1%	625,756	91.5%
5	371,492	83.8%	543,582	92.1%	538,706	92.4%	591,467	90.9%

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Grade	2018-2019		2021-2022		2022-2023		2023-2024	
	Sample *n*	% in Sample	Sample *n*	% in Sample	Sample *n*	% in Sample	Sample *n*	% in Sample
6	267,824	92.5%	376,025	90.3%	328,996	75.8%	426,128	86.8%
7	211,077	89.6%	293,466	91.7%	310,795	92.5%	362,658	90.3%
8	176,120	87.7%	274,675	91.7%	278,281	92.8%	299,290	90.4%
Mathematics								
K	44,123	32.6%	295,667	55.1%	461,225	91.1%	453,879	87.9%
1	191,281	51.4%	413,566	64.3%	659,491	93.2%	700,419	91.6%
2	189,294	40.2%	662,858	93.6%	649,736	93.5%	775,048	92.1%
3	167,234	34.3%	675,692	93.2%	680,936	93.1%	728,049	92.1%
4	173,081	34.6%	642,364	92%	664,178	92.7%	738,846	91.5%
5	411,483	82.3%	651,844	91.6%	643,439	91.9%	704,313	90.9%
6	315,231	91.7%	487,941	90.8%	463,344	85.3%	540,666	90.9%
7	224,596	85%	374,033	90.8%	391,347	91.2%	435,493	90.2%
8	138,240	79.2%	309,659	90.5%	330,532	91.5%	341,230	90.9%

Measures

Student achievement was measured with Curriculum Associates' *i-Ready Diagnostic* for Reading and for Mathematics. The Diagnostic is an online, adaptive, and criterion-referenced assessment of student learning for reading and for mathematics in Grades K–8. It is built on college- and career readiness standards and provides grade-level placements. Most school districts administer the Diagnostic to students three times during the school year—in fall, winter, and spring. To learn more about the *i-Ready Diagnostic*, including a discussion of its reliability and validity, see the Appendix.

When students take the *i-Ready Diagnostic*, they receive a scale score that reflects their test performance and can then be used for comparison across grades and time. Scale scores are used to determine the student's criterion-referenced placement level relative to their chronological grade level. This placement level provides context for a student's performance that designates their performance as being on grade level, below grade level, or above grade level. For example, a Grade 2 student can place below grade level at the Grade 1 level (i.e., One Grade Level Below), at the Grade K level (i.e., Two Grade Levels Below), or above grade level at the Grades 3–8 level (i.e., Above Grade Level). See the Appendix for the *i-Ready* placement-level descriptors. Students who place Early On Grade Level have partially met grade-level college- and career-readiness standards, and students who are Mid or Above Grade Level have met or exceeded grade-level college- and career readiness standards. Students who are Two or More Grade Levels Below are not yet close to meeting grade-level college- and career-readiness standards and may need additional instruction to fill in gaps in foundational concepts and knowledge.

To best contextualize changes in academic achievement from pre- and post-pandemic, we report both changes in average scale score and the percentage of students by placement level. For the purposes of this report, students who placed Early On Grade Level or higher were designated as performing on grade level, and students who placed Two or More Grade Levels Below were designated as performing below grade level. The lowest Grade K students can place is One Grade Level Below or Emerging K. As such, they are not reflected in the below-grade level data.

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RESULTS

Reading

Percentage of On- and Below-Grade Level Students

Exploring the proportion of students on grade level in reading at the end of the 2023–2024 school year reveals comparable results to spring 2023 (Figure 1). The proportion of students on grade level remains below pre-pandemic trends but on par with prior years (i.e., spring 2022 and 2023). Changes from pre- to post-pandemic were larger in younger grades (i.e., Grades K–4), with more precipitous drops in percentages. Older grades (i.e., Grades 5–8) showed relatively stable proportions of students on grade level from pre- to post-pandemic. In some grades, namely Grades 1 and 2, there was small recovery from the 2021–2022 to the 2022–2023 school years, but limited increases since.

These trends were largely mirrored when examining the proportion of students below grade level (Figure 2). Immediately post-pandemic, there were increases in students ending the year below grade level in elementary school. These values have demonstrated very little change since. Any change in these proportions from spring 2023 to spring 2024 reflects small increases across every grade—a small but disheartening trend.

Figure 1. On Grade Level by Year—Reading

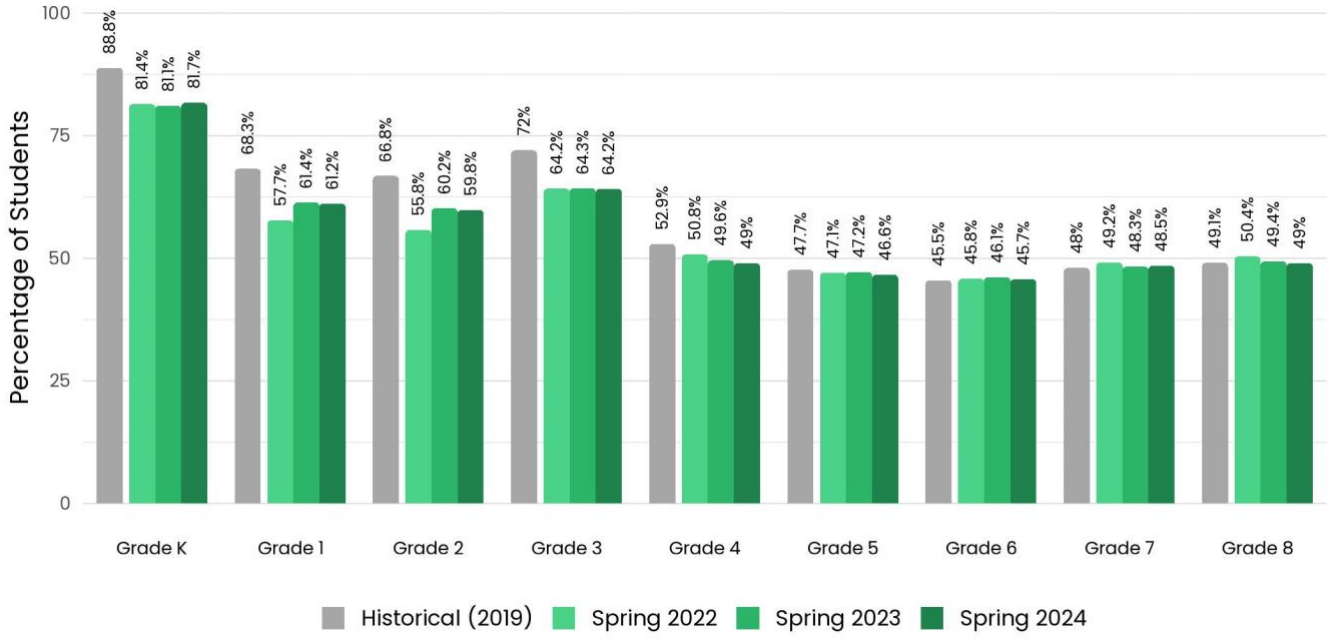

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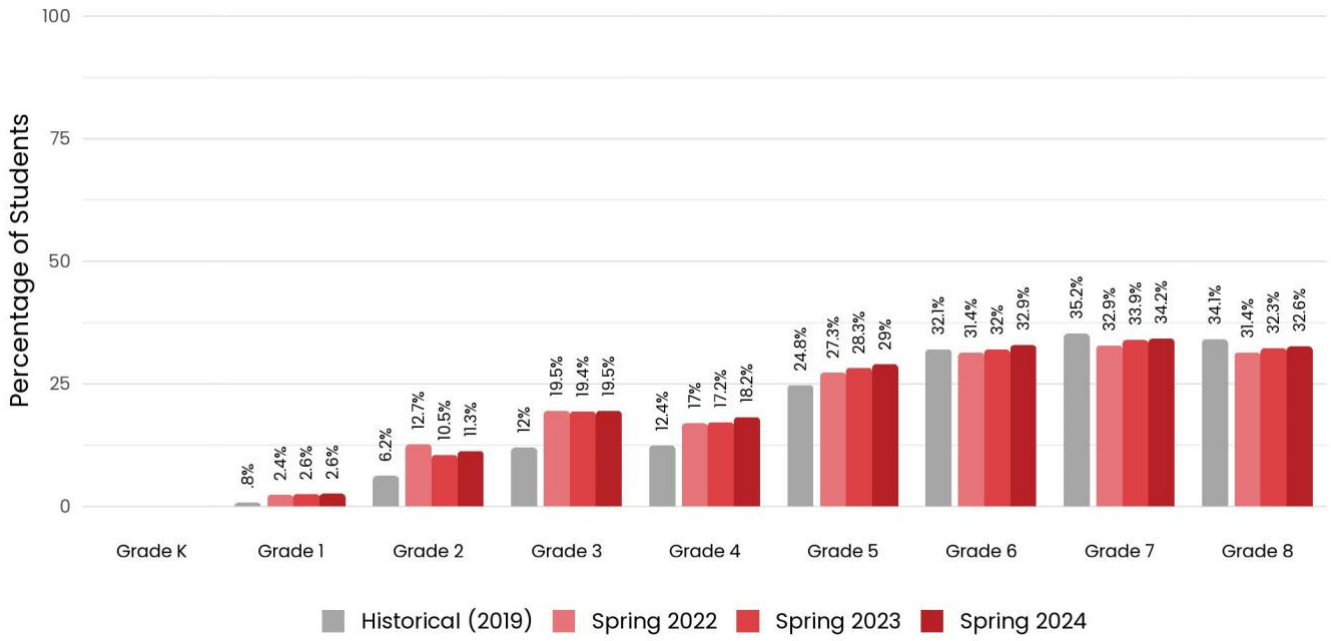
Figure 2. Below Grade Level by Year—Reading



Scores and Annual Growth

After a small decline in the amount of annual growth achieved in the 2021–2022 school year, student academic growth has largely rebounded to pre-pandemic levels (Figure 3). In some grades, the amount of annual growth achieved is exceeding historical annual growth averages. Scores at school entry, however, generally remain below pre-pandemic scores, especially for students in Grades K–5. Though annual growth has rebounded, or exceeded historical growth, this at most represents two scale score points above pre-pandemic averages. Initial fall scores, on the other hand, have declined up to 12 points in some grades. With lower scores in the fall and equivalent growth occurring across the school year, it has been challenging for students to show "recovery," or spring scores comparable to pre-pandemic averages. Examining Grade 3 specifically, students would need to demonstrate growth 12 points higher than current averages to achieve historical spring scores. These effects may compound over time and create larger gaps in academic growth (Young & Young, 2024a).

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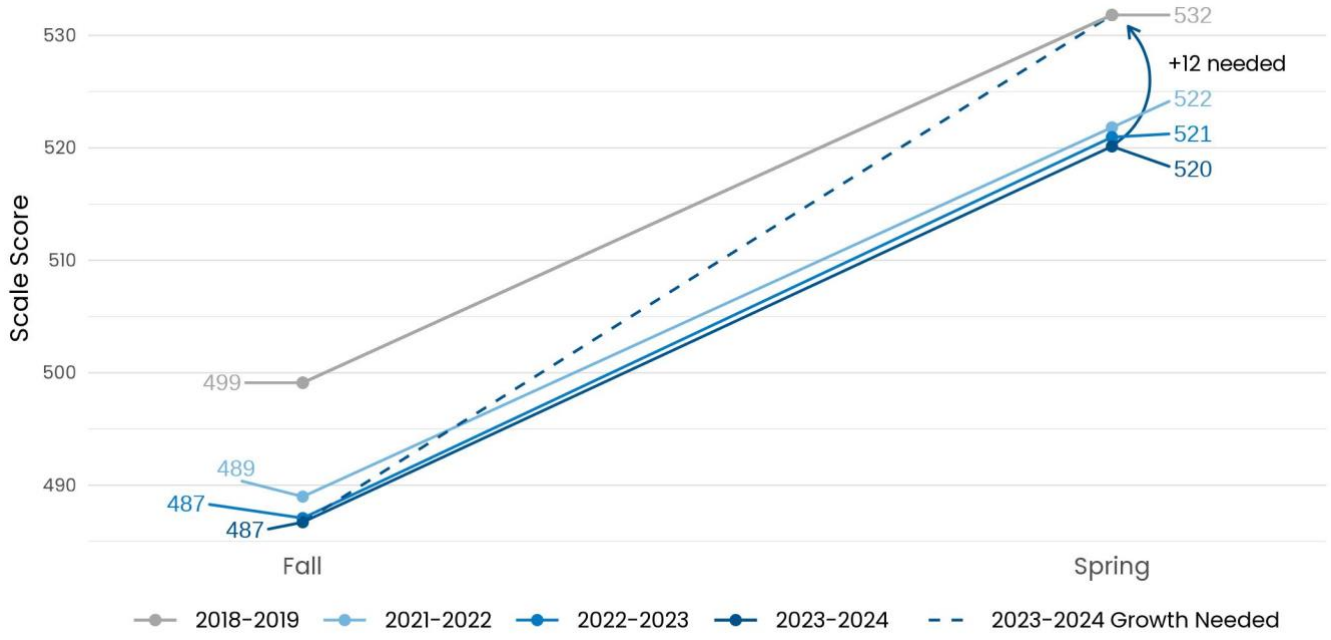
Figure 3. Fall-to-Spring Scales Scores—Grade 3 Reading



Average scores have not only declined post-pandemic but have also begun to show more variability, with larger standard deviations since the 2021–2022 school year. Previous work has identified differences in recovery patterns by student prior achievement (Dawson, 2022; Young & Young, 2024a), with gaps between students on and below grade level widening over time. In the current study, evaluating annual growth by starting placement level shows students who began below grade level are not making the growth needed to reach historical spring scores (Figure 4).

Students who began on grade level, on the other hand, have maintained very comparable growth and scores. These varied patterns suggest much of the decline in grade-level students results from students who are below grade level in the fall not demonstrating the growth needed to reach grade level in the spring. Examining Grade 3 reading specifically, there is an obvious shift in the lower half of the spread of spring scores, whereas the upper half—students above the 50th percentile—show a largely unchanged distribution of scores (Figure 5). The wider and more varied dispersion of scores provides more evidence as to the disparate and possibly inequitable recovery patterns.

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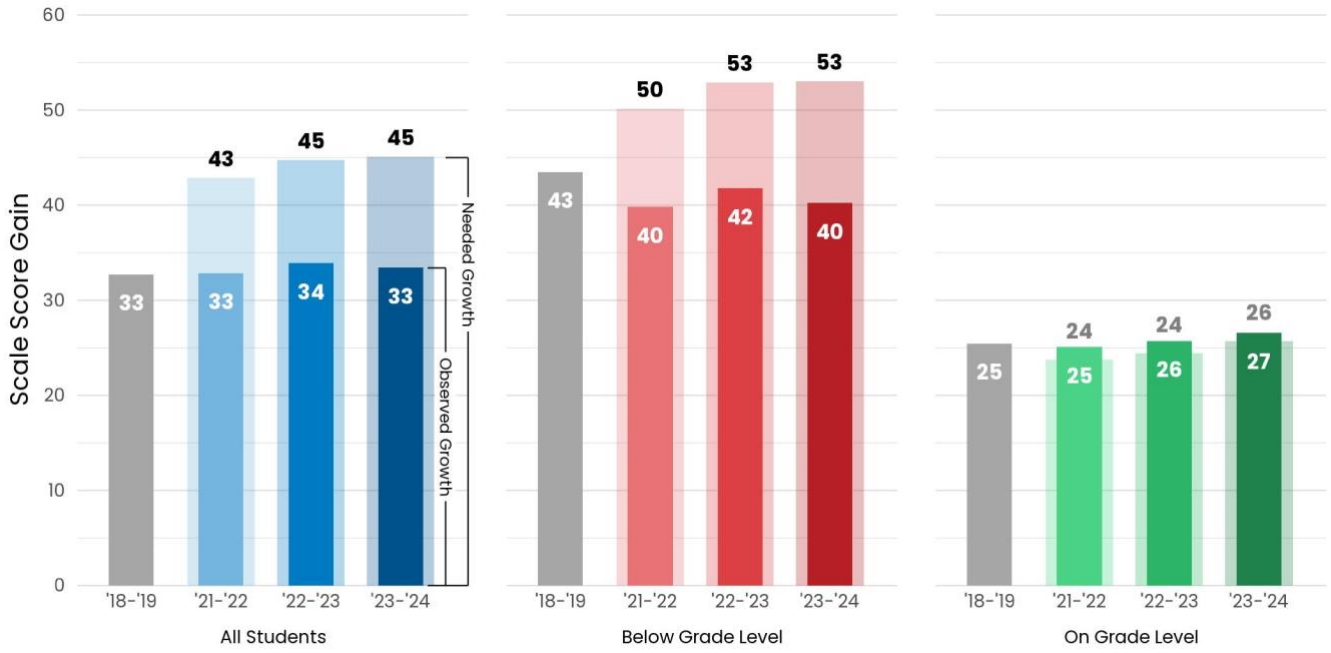
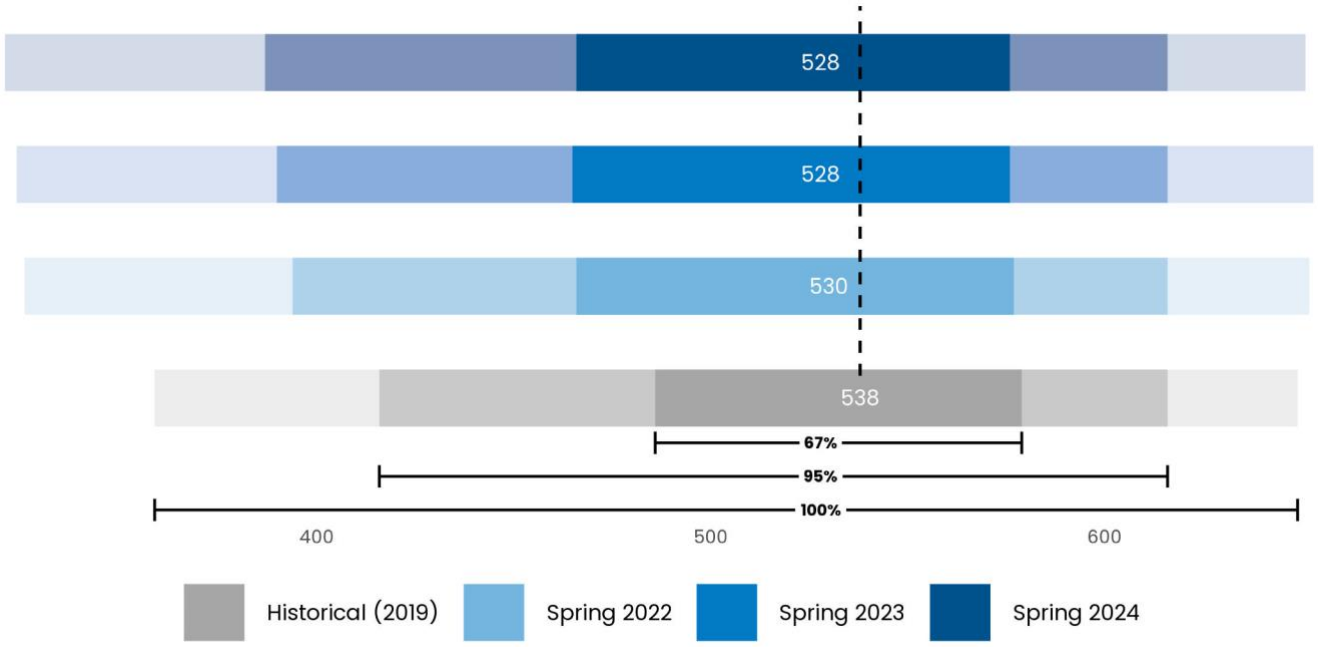
Figure 4. Fall-to-Spring Observed and Needed Growth by Grade Level—Grade 3 Reading



Note: Observed growth represents the average growth achieved for Grade 3 students in that respective year. Needed growth represents the average annual growth needed to achieve historical average spring scores. Data label values are rounded.

Figure 5. Spring Scale Score Variability—Grade 3 Reading



Note: Values represent the median of each distribution, with the historical median plotted across each with a dotted line. The shaded areas represent the ranges in which 67%, 95%, and 100% of the scores fall.

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Domain-Level Performance

Evaluating the proportion of students on grade level in one reading domain offers a small but encouraging trend. Students in Grade K ending the year on grade level in Phonics, a strong predictor of later reading ability (Crone et al., 2023), has slightly increased each year since return to in-person schooling (Figure 6). In just this past year, there was a 2.2% increase in students placing on grade level in Phonics in Grade K. Applied nationally, this would translate to nearly 75,000 more Grade K students reaching grade level in Phonics. All other grades show comparable proportions of students on grade level from the prior school year to the current, with recovery—or percentages mirroring pre-pandemic values—varying by grade level.

Similarly, examining trends in the proportion of students below grade level reveals stagnant numbers in years since the pandemic (Figure 7). With large increases immediately post-pandemic, small signs of recovery from spring 2022 to spring 2023, and limited change since, proportions of students below grade level remain above historical trends. As in overall reading performance, these trends were more pronounced for younger students, with older grades appearing less impacted overall, with smaller or non-existent increases in students below grade level immediately post-pandemic.

Figure 6. On Grade Level by Year—Phonics

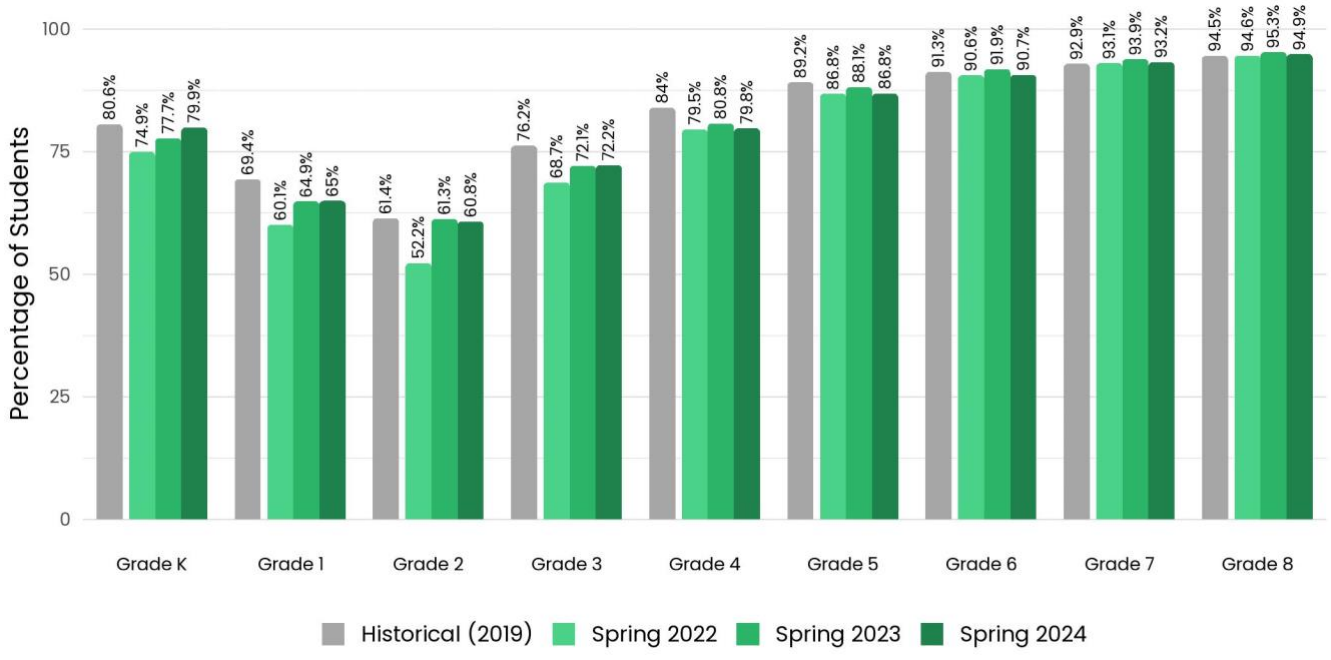

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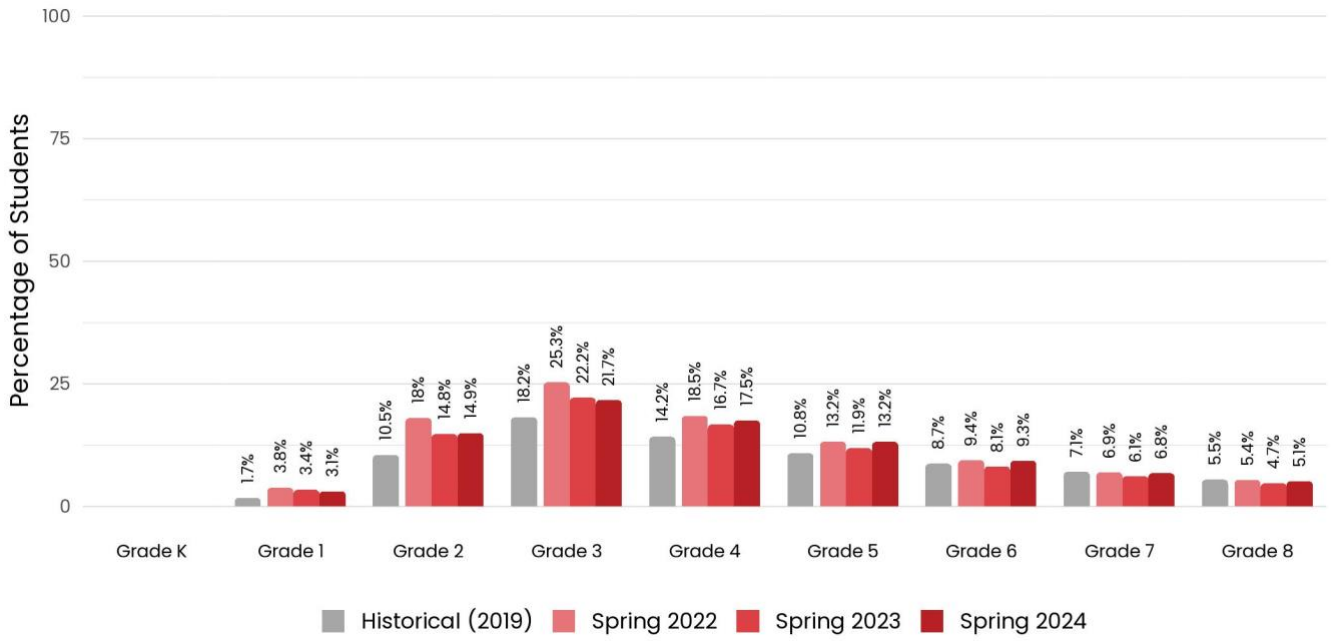
Figure 7. Below Grade Level by Year—Phonics



School Demographics

Examining students on grade level in reading by school demographics shows mostly stagnant trends from the prior school year to this most recent, with most groups still behind pre-pandemic trends (Figure 8). In schools serving majority Black students, though, there were some slight increases in the proportion of grade-level students. While small and relegated to certain grades, these increases over pre-pandemic levels of achievement are encouraging signs of a narrowing of disparities (Table 2).

Schools serving majority Hispanic students, on the other hand, do not see the same grade-level differences. Across all grades, students in these schools demonstrate very similar proportions of students on grade level as seen in 2023, which remain below spring 2019 values. This trend is comparable in schools serving majority White students as well. Despite stagnant performance, schools serving majority White students still demonstrate larger proportions of students on grade level than schools serving minoritized communities, indicating disparities persist.

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Figure 8. On Grade Level by School Demographics—Grade 3 Reading

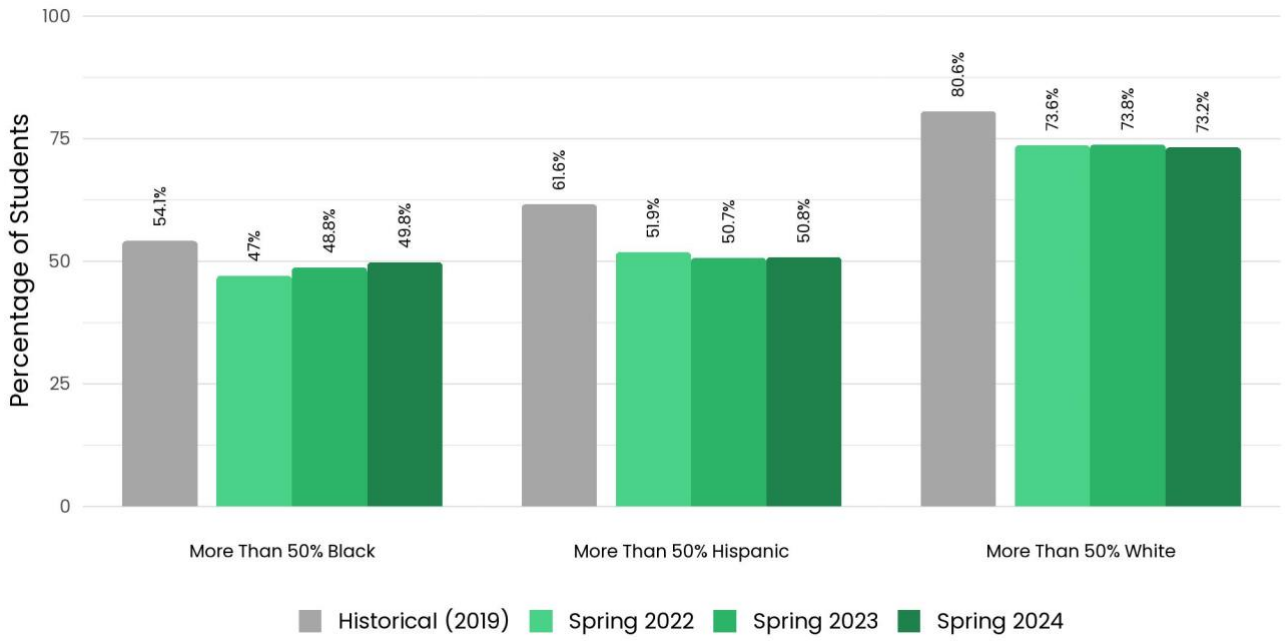

Table 2: On Grade Level by Schools Serving Majority Black, Hispanic, or White Students—Reading

Grade	More Than 50% Black				More Than 50% Hispanic				More Than 50% White			
	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024
K	81.3%	72.6%	74.2%	73.8%	83.7%	72.2%	71%	71.9%	93%	87.6%	87.3%	87.8%
1	54.5%	41.5%	47.6%	48.3%	58.7%	44.5%	47%	48%	75.3%	66.1%	70.7%	70%
2	49.9%	38.6%	45.8%	45.7%	56.6%	42.9%	45.9%	46.6%	74.9%	64.9%	68.6%	68.3%
3	54.1%	47%	48.8%	49.8%	61.6%	51.9%	50.7%	50.8%	80.6%	73.6%	73.8%	73.2%
4	34%	32.6%	32.6%	33.8%	41.8%	38.7%	35.3%	34.9%	62.4%	59.9%	58.5%	58%
5	30.1%	30.8%	31.1%	32.2%	38%	36.1%	33.4%	33%	57.1%	55.1%	55.8%	54.5%
6	30.4%	28%	28.8%	30.9%	35.8%	35.1%	33.4%	33.2%	54.5%	52.2%	52%	52%
7	33.2%	32.7%	32.6%	33.7%	38.7%	39.6%	36%	36.1%	57%	53.8%	53.2%	53.7%
8	35.6%	36.8%	32.9%	36.4%	41.1%	41.1%	37.6%	37.2%	56.5%	54.8%	54%	53.7%

Median Income

Evaluating the proportion of students on grade level by community income level shows continued gaps in achievement between lower- and higher-income communities (Figure 9). As in overall reading, these trends vary by grade level. Grades 5 and above demonstrated small changes in the proportions of grade-level students in reading from spring 2019 to post-pandemic across all income levels. These proportions remain very comparable in spring 2024 (Table 3). Younger grades, however, show proportions lower than pre-pandemic values across all income levels. Though patterns are comparable across income groups—younger grades show drops with limited increase in years' since—the relative proportion of students on grade level by median income remains much higher in higher-income communities, again suggesting continued disparities.

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Figure 9. On Grade Level by Median Household Income—Grade 3 Reading

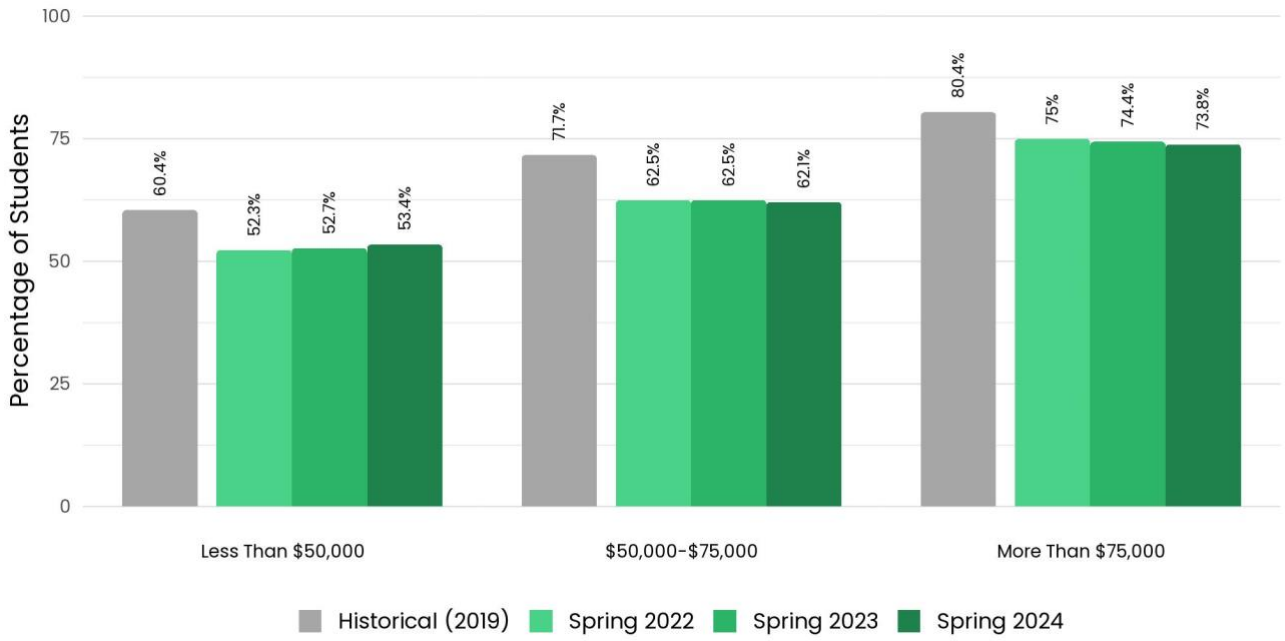

Table 3: On Grade Level by Median Household Income—Reading

Grade	Less Than $50,000				$50,000-$75,000				More Than $75,000			
	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024
K	84.5%	75.5%	76.2%	76.6%	89.3%	80.9%	80.3%	80.9%	91.9%	86.6%	86.7%	87.4%
1	58.3%	46.1%	51.5%	51.8%	66.9%	55.2%	59.2%	58.7%	76.7%	68.2%	70.4%	70.4%
2	55.2%	43.2%	48.9%	48.7%	65.6%	53.6%	57.7%	57.6%	75.7%	67.2%	70.5%	70.1%
3	60.4%	52.3%	52.7%	53.4%	71.7%	62.5%	62.5%	62.1%	80.4%	75%	74.4%	73.8%
4	40.7%	38.3%	37%	37.2%	51.7%	48.3%	46.8%	46.2%	63.7%	61.5%	60.7%	59.8%
5	36%	35%	35.5%	35%	46.8%	44.8%	44.5%	43.8%	58.7%	58.1%	57.8%	57.3%
6	35.6%	34.9%	35.3%	35.3%	45.1%	43.1%	43.5%	42.9%	54.4%	54.9%	55.3%	55.2%
7	38.1%	39.4%	38.2%	38%	47.7%	46.8%	45%	45.2%	56.3%	57.4%	57.1%	57.3%
8	40.1%	41%	40.6%	39.7%	48.7%	48.2%	46.8%	46.1%	56.5%	58.5%	57.3%	57%

Mathematics

Percentage of Grade-Level Students

Overall mathematics results show similar grade-level trends as in reading, with older students demonstrating less decline than younger students immediately post-pandemic (Figure 10). These declines were more pronounced, though, with older grades declining by an average of four points and some younger grades declining by nearly 15 points. These proportions have not demonstrated change from spring 2023 to spring 2024, so values remain well below pre-pandemic proportions for young students.

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Similarly, there were marked increases in the proportion of students below grade level, especially for younger grades (Figure 11). These values have also remained stagnant every year since, with almost no change from spring 2021 to spring 2024.

Figure 10. On Grade Level by Year—Mathematics

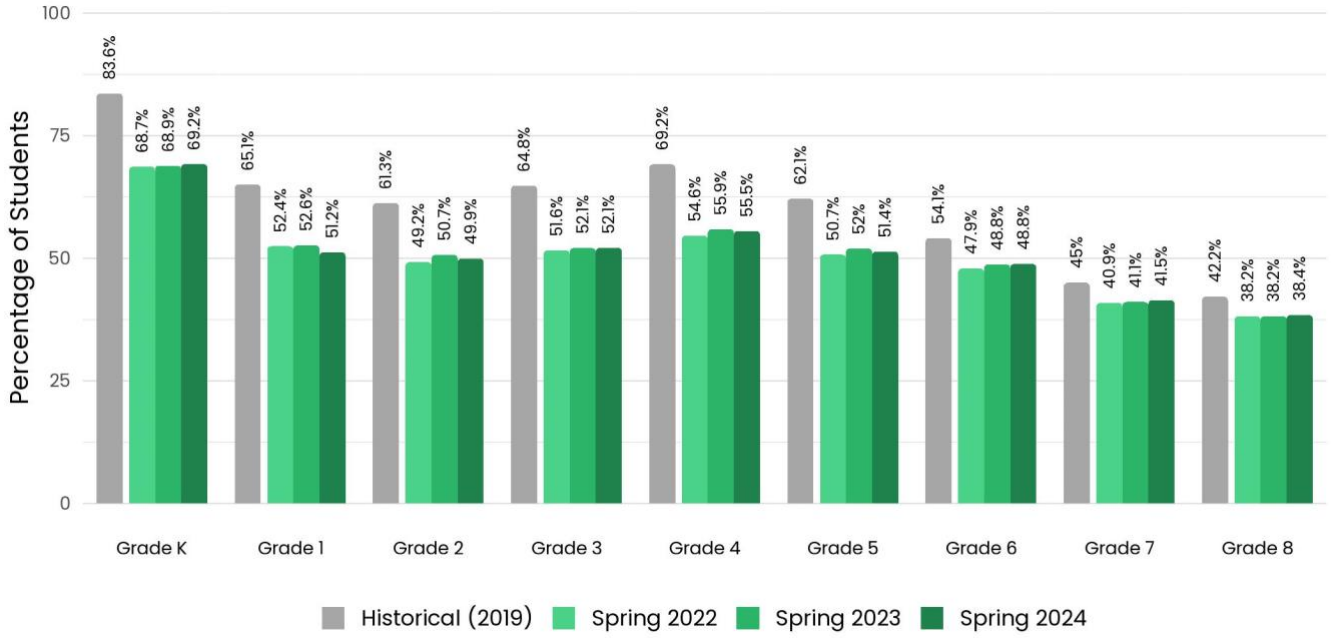
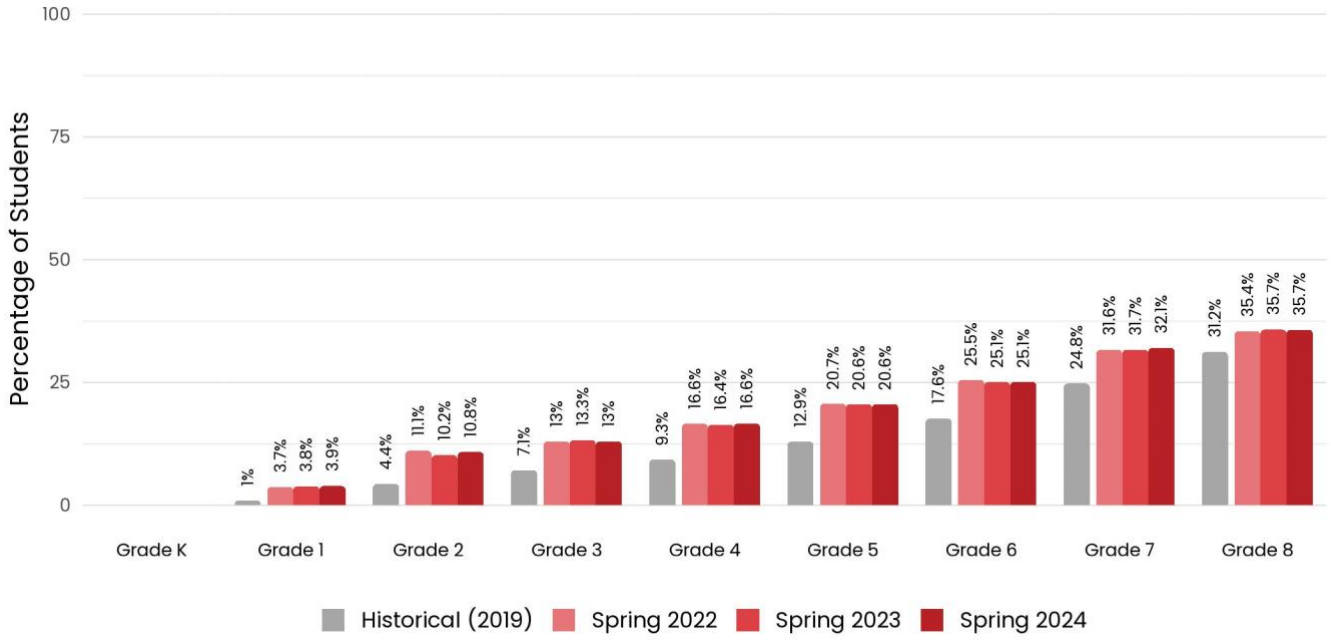


Figure 11. Below Grade Level by Year—Mathematics



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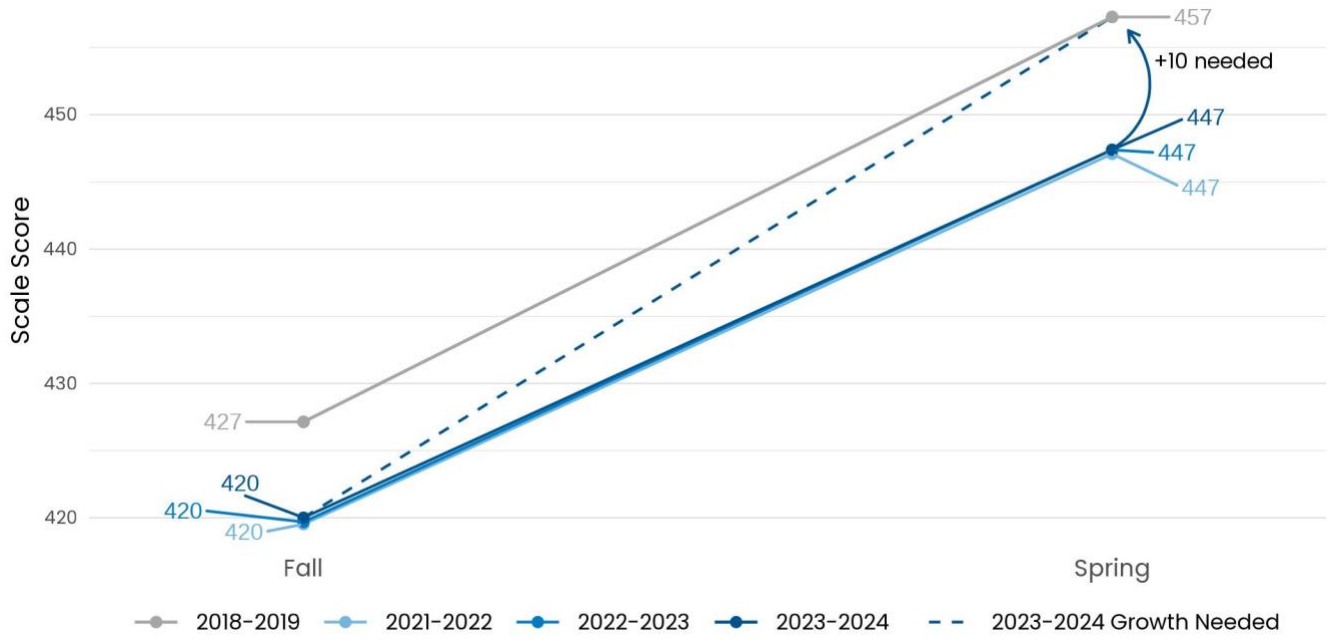
Scores and Annual Growth

Annual growth in mathematics showed declines immediately post-pandemic, specifically in Grades K–4, but has largely rebounded since (Figure 12). Annual growth now has come closer to historical growth for younger students. As in reading, growth was less impacted in older grades, remaining stable from before the pandemic and each year since. Scores at school entry and end of year, however, have been more impacted. In Grade K, for example, scores at fall entry are currently still eight points lower than before the pandemic. With comparable growth year over year, little progress has been made in end-of-year scores approaching spring 2019 averages. In Grade 3, students would need to grow an average of 10 points higher to reach these historical scores. Again, these gaps may compound over time, making it more challenging for students to reach grade level despite comparable growth.

Figure 12. Fall-to-Spring Scales Scores—Grade 3 Mathematics



Similar to those in reading, these scores also show increase in variability post-pandemic, with larger standard deviations beginning in spring 2022, suggesting a growing difference in academic achievement between on- and below-grade level students. Students who began the year on grade level demonstrate annual academic growth that keeps them on par with historical spring scores (Figure 13). For students who started the year below grade level, their academic growth falls short of reaching pre-pandemic levels of achievement. These differences are mirrored when examining the spread of spring scores from pre- to post-pandemic (Figure 14). Though the dispersion of scores has shifted more globally in mathematics than in reading (i.e., scores above the 50th percentile also shifted), the overall pattern remains similar, again suggesting greater variation in student performance.

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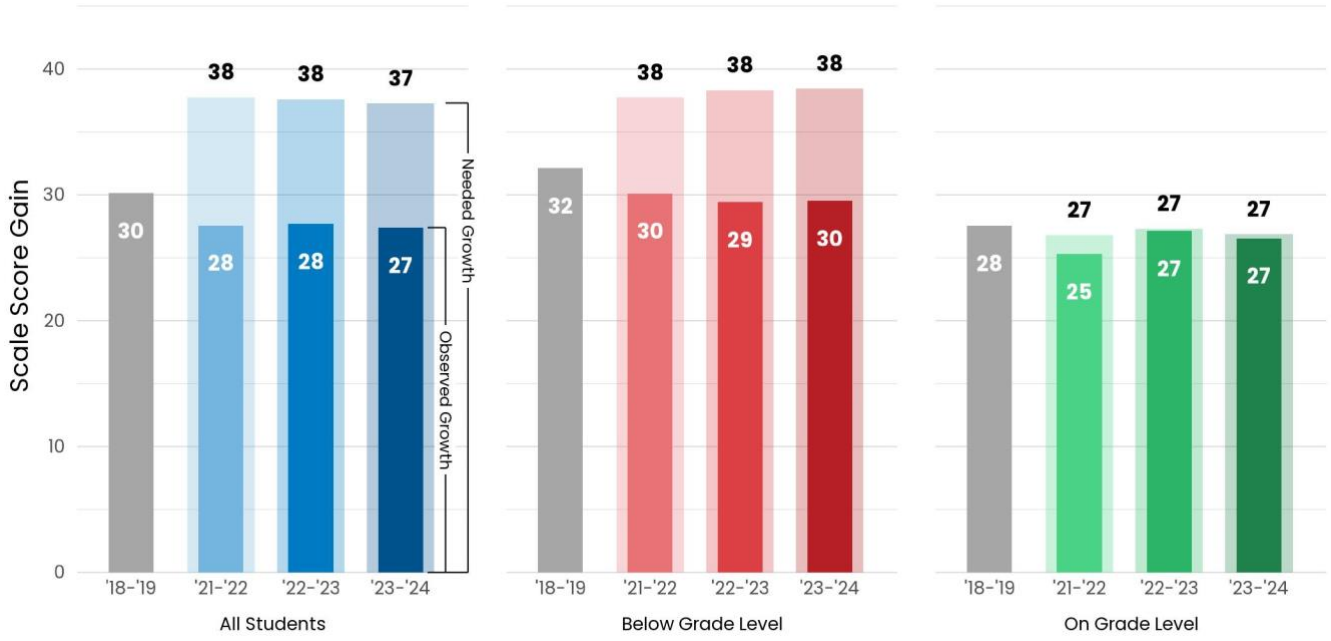
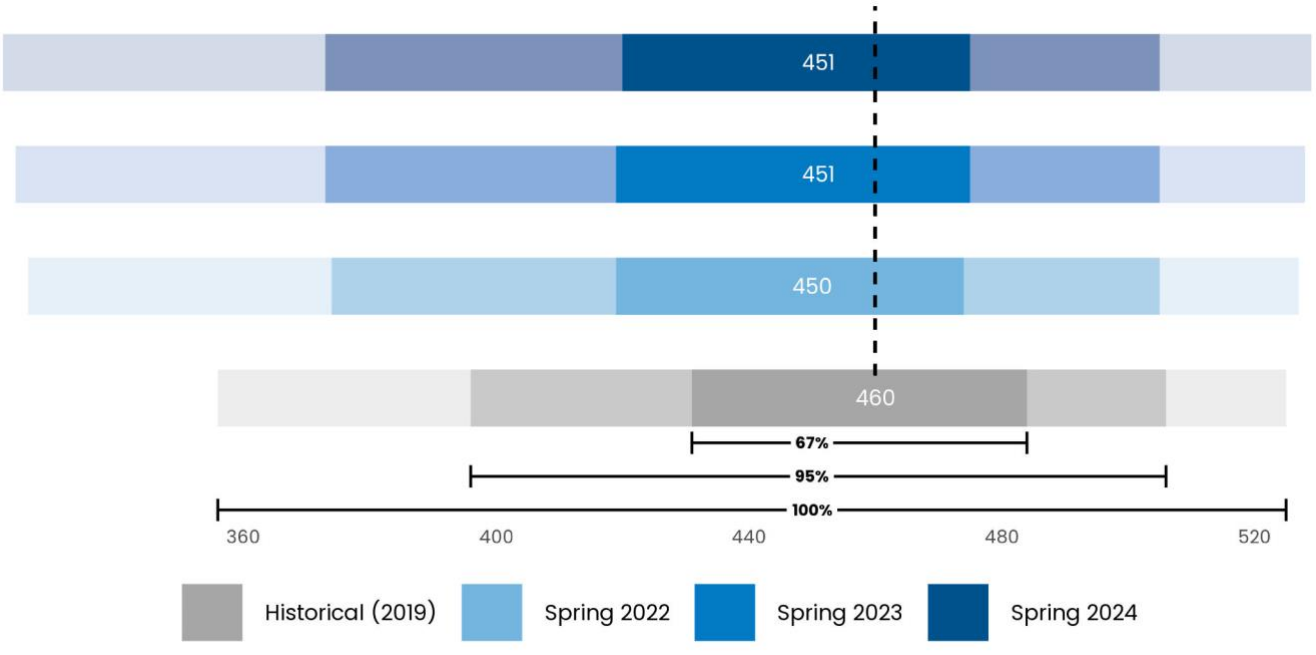
Figure 13. Fall-to-Spring Observed and Needed Growth by Grade Level—Grade 3 Mathematics



Note: Observed growth represents the average growth achieved for Grade 3 students in that respective year. Needed growth represents the average annual growth needed to achieve historical average spring scores. Data label values are rounded.

Figure 14. Spring Scale Score Variability—Grade 3 Mathematics



Note: Values represent the median of each distribution, with the historical median plotted across each with a dotted line. The shaded areas represent the ranges in which 67%, 95%, and 100% of the scores fall.

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Domain-Level Performance

To offer more insight to mathematics performance, we also evaluated the percentage of grade-level students in the Number and Operations domain (Figure 15). This domain is foundational to students' understanding and performance in mathematics. Defined by the National Council of Teachers of Mathematics, Number and Operations is the mathematical domain of understanding number systems, the relationships between numbers, mathematical operations such as addition, subtraction, multiplication, and division, and the skills of computation and estimation. Trends in student performance in this domain mirror overall trends in mathematics. The proportion of students on grade level, across all grades, remains very similar each year post-pandemic but still behind pre-pandemic levels. In some grades, there were small increases from 2021–2022 to 2022–2023, but proportions have been stable since.

These trends are mirrored in the proportion of students below grade level, with increases immediately post-pandemic and almost no change to these values in years since (Figure 16). Spring 2024 values remain nearly identical to spring 2023 values across most grades.

Figure 15. On Grade Level by Year—Number and Operations

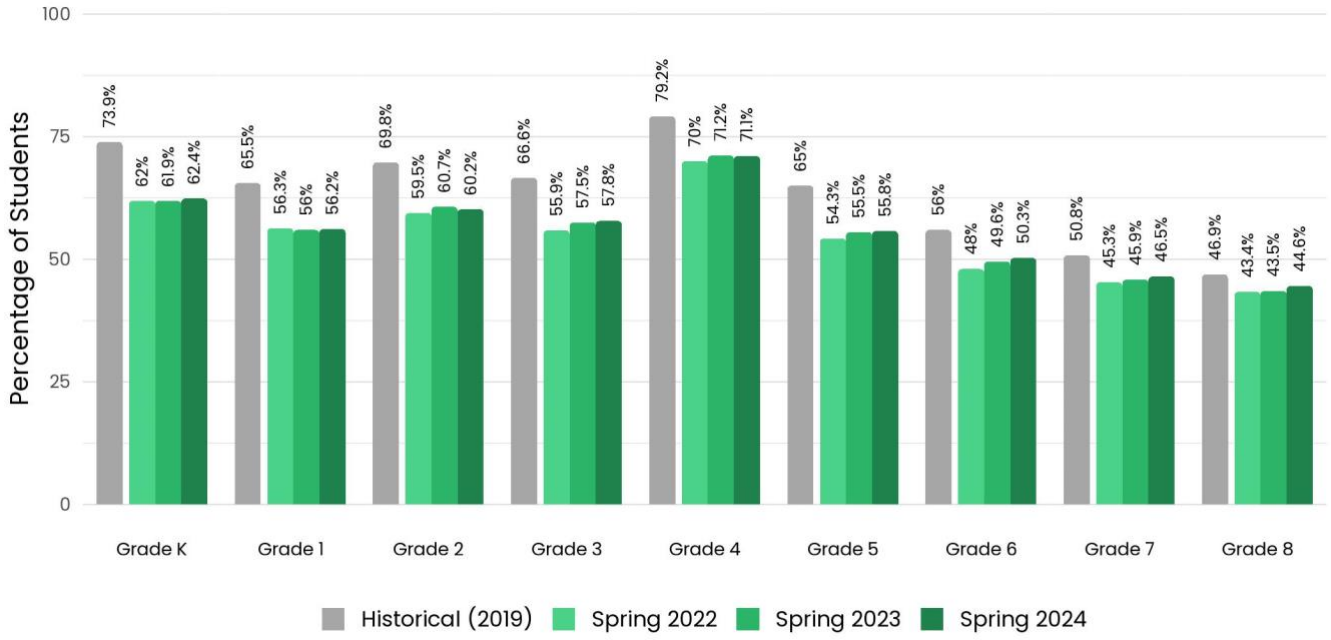

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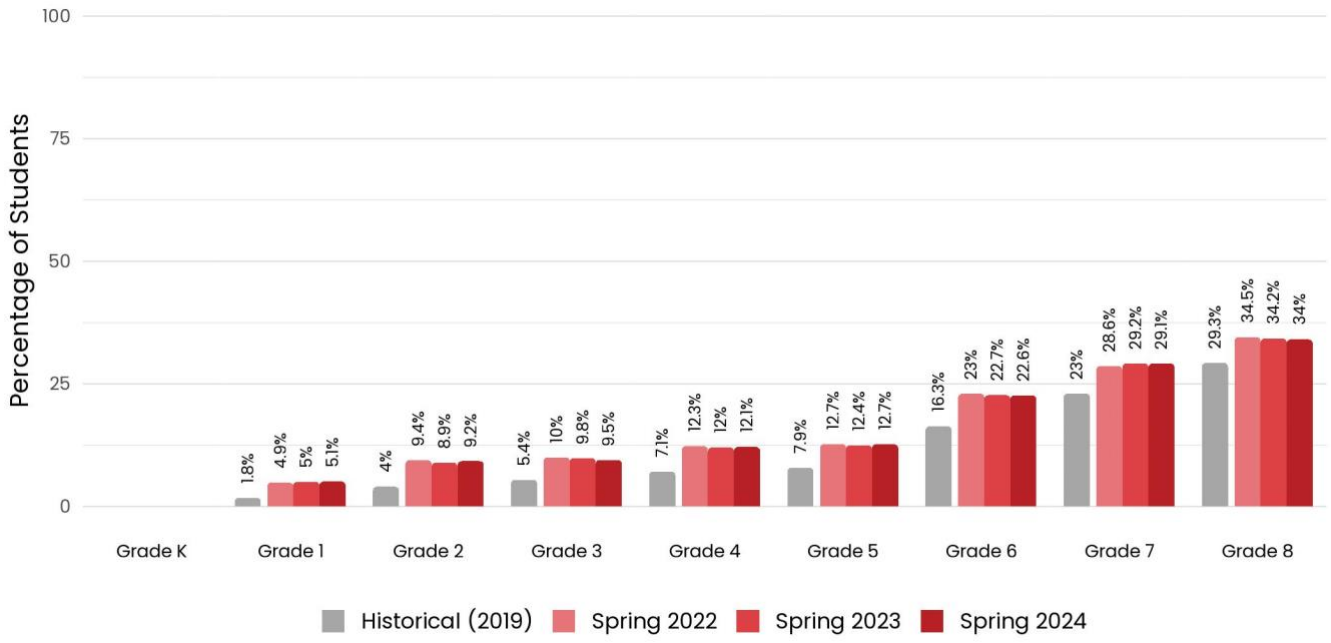
Figure 16. Below Grade Level by Year—Number and Operations



School Demographics

Evaluating the proportion of students on grade level in mathematics by school demographics reveals similar trends as in reading (Figure 17). In schools serving majority Black students, proportions from spring 2023 to spring 2024 demonstrate small but encouraging increases in many grades. Despite these increases, all grades remain below pre-pandemic levels of achievement, with younger learners again showing limited recovery. Grades K–2 students show almost no increase from 2023 to 2024 in grade-level students in majority Black schools. As in reading, schools serving majority Hispanic or White students show limited changes in the proportion of grade-level students across all grades. In these schools, proportions are largely similar from spring 2023 to spring 2024 but are still below pre-pandemic levels (Table 4).

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Figure 17. On Grade Level by School Demographics—Grade 3 Mathematics

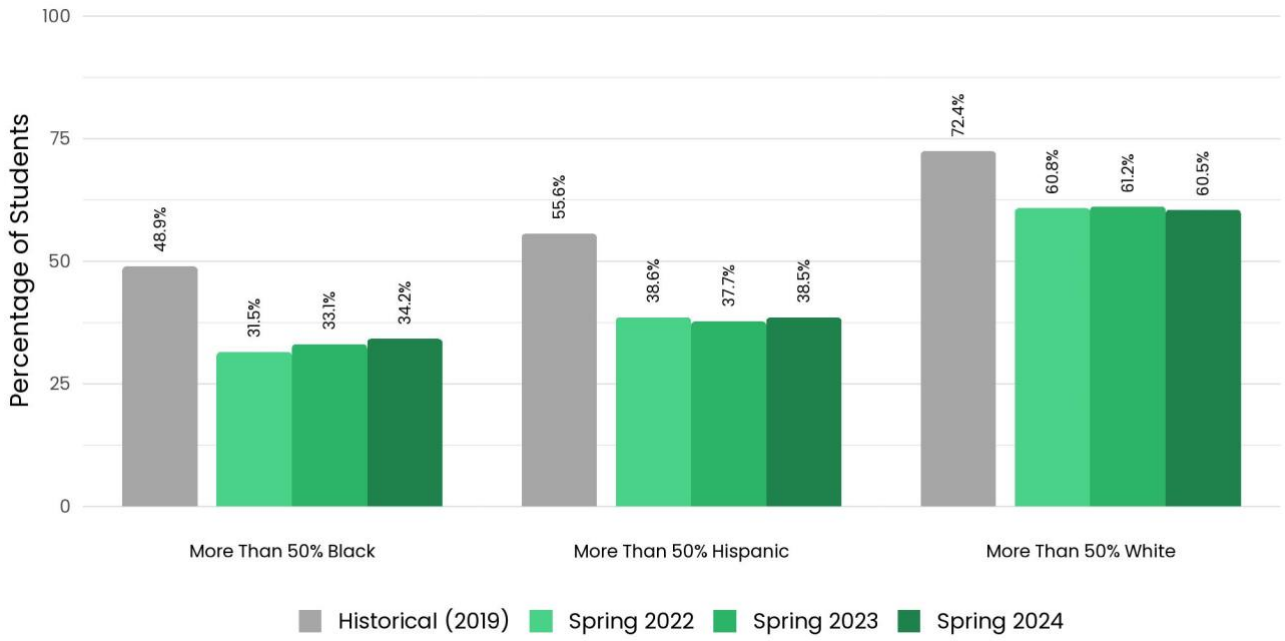

Table 4: On Grade Level by Schools Serving Majority Black, Hispanic, or White Students—Mathematics

Grade	More Than 50% Black				More Than 50% Hispanic				More Than 50% White			
	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024
K	75.7%	56.4%	57.8%	57.9%	77.5%	58.7%	57.4%	57.8%	87.8%	75.8%	76.1%	76.5%
1	50%	33.3%	35.9%	35.5%	55.2%	39.6%	38.3%	37.5%	72.6%	61.5%	61.7%	60.3%
2	44.1%	29%	31.6%	31.9%	51.4%	35.8%	34.6%	35.8%	69.2%	58.9%	60.1%	59.3%
3	48.9%	31.5%	33.1%	34.2%	55.6%	38.6%	37.7%	38.5%	72.4%	60.8%	61.2%	60.5%
4	53.9%	32.5%	34.7%	36.3%	60.8%	41.2%	40.9%	41.1%	76%	64%	65.2%	64.7%
5	45.5%	30.4%	30.4%	31.7%	52.9%	38.1%	37%	37.3%	70.4%	59.8%	61.6%	59.9%
6	38%	28.2%	28.2%	30%	43.7%	35.3%	33.6%	34.9%	63.3%	55.8%	56.2%	56.5%
7	30.2%	24.3%	26.1%	26.9%	32.6%	29.5%	26.8%	28.4%	54.4%	46.9%	47.5%	47.5%
8	31.7%	25.2%	24.9%	28.1%	29.3%	27%	26.6%	26.9%	49.5%	43.5%	43.6%	43.3%

Median Income

Trends by median income largely mirror those of the overall sample. There have been minimal changes year over year post-pandemic in the proportion of students on grade level, across all grades and income groups (Figure 18). Across each group, these values remain below pre-pandemic levels (Table 5). These patterns are again mirrored across income level—declines in grade-level students post-pandemic with limited recovery—suggesting students from all income levels were impacted. Yet, the relative proportions of grade-level students vary widely by median income, highlighting continued disparities between higher- and lower-income communities.

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Figure 18. On Grade Level by Median Household Income—Grade 3 Mathematics

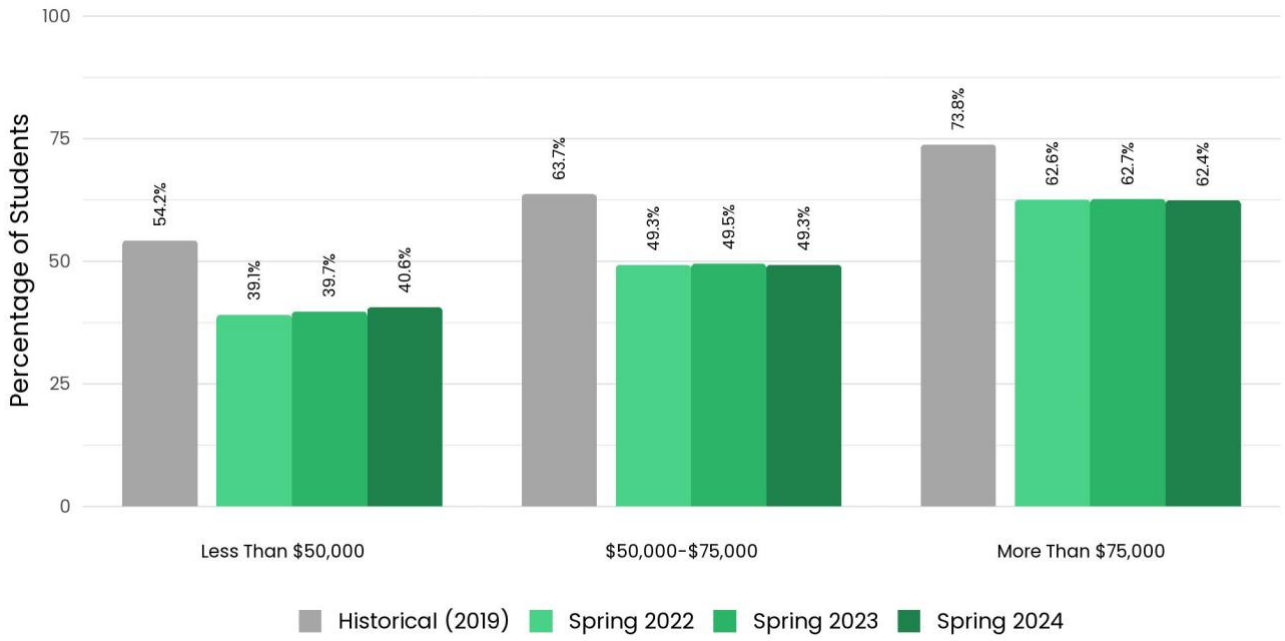

Table 5: On Grade Level by Median Household Income—Mathematics

Grade	Less Than $50,000				$50,000-$75,000				More Than $75,000			
	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024	Spring 2019	Spring 2022	Spring 2023	Spring 2024
K	78.3%	60.7%	62.2%	61.6%	83.4%	68%	68%	68.4%	88.2%	75.4%	76.1%	77.4%
1	55.1%	41.3%	42.2%	40.9%	64%	50.4%	50.3%	49%	73.5%	61.7%	62.2%	60.7%
2	50.1%	37.2%	39.2%	38.4%	60.2%	47.3%	47.9%	47.6%	70%	59.5%	60.7%	60.2%
3	54.2%	39.1%	39.7%	40.6%	63.7%	49.3%	49.5%	49.3%	73.8%	62.6%	62.7%	62.4%
4	59.7%	41.9%	43.6%	43.2%	68.4%	52.4%	53.3%	52.8%	77%	65%	66.3%	66.1%
5	51.8%	38.4%	39.6%	39%	61.5%	48.5%	49.4%	48.2%	71.7%	61.5%	62.7%	62.6%
6	44.8%	36.5%	37.2%	37.6%	54.3%	45.4%	45.5%	45.5%	62.4%	57.5%	59%	59.4%
7	36.1%	32.1%	31.9%	31.6%	44.5%	39.1%	38.4%	38.5%	53.1%	49.2%	49.7%	50.5%
8	35.4%	30%	30.8%	29.7%	41.5%	36%	35.9%	35.7%	48.6%	46.8%	46.2%	46.8%

DISCUSSION

Achievement results from more than 10 million students accurately representing the nation further highlight the lasting impact of the pandemic on academic performance. In most cases, achievement at the end of the 2023–2024 school year mirrors that of the 2022–2023 school year, indicating limited recovery since 2021. These averages, while helpful for assessing the high-level state of learning in the nation, hide trends that may offer insight into keys to recovery. Though proportions of grade-level students remained stagnant, there were very few drops, indicating a steadier level of achievement, and there were cases in which there were small increases. Grade K demonstrated increases in the proportion of students on grade level in Phonics, a predictor of later

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reading ability (Crone et al., 2023). With the focus on the Science of Reading and large efforts to reprioritize these foundational reading skills (Schwartz, 2022), this may have manifested into some recovery for these young students in certain domains. There were also increases in the proportion of grade-level students in schools serving majority Black students for Grades 3 and up. Though there were continued disparities post-pandemic, these small increases offer an encouraging sign of recovery for some minoritized communities.

Examining trends with a more nuanced lens also reveals much of the decline in scores and fewer students reaching grade level is driven by students below grade level. Patterns in growth show comparable amounts of annual growth for each placement level, but scores at school entry are much lower for students who began below grade level than those same students prior to the pandemic. Students beginning the year below grade level are not making enough growth throughout the school year to make up lost ground. Subsequently, fewer students are reaching grade level by spring. Students who were on grade level in the fall saw limited change in their annual growth and scores at school entry. Examining variability shows complementary results. The upper half of student achievement remains largely unchanged from pre- to post-pandemic, especially in reading, whereas the lower half—students below the 50th percentile—is extending further down. These shifts indicate students below grade level are likely falling further behind, while students on grade level are close to their own historical trends. By examining achievement variability, we gain a unique perspective on differing recovery patterns hidden by whole sample averages. These results further emphasize the need to review student performance with a more individualized lens, understanding which students require continued and potentially more targeted support.

Limitations

The results from the current study are descriptive. For this reason, we refrain from making any strong inferences. These results also do not offer causal evidence of the impact of the pandemic or recovery efforts taking place nationwide. Instead, we simply provide and describe trends in student performance across pre- and post-pandemic time frames. In addition, our stratified sampling techniques—although creating a closer representation of the nation—relies on school-level demographics as opposed to student level. Using school-level demographics is coarse and insensitive to variation compared with student-level data and therefore may diminish patterns at the student-level demographic group. Though the sample is nationally representative, we did not have the data required to report out on other demographic groups, including Multilingual Learners, students with disabilities, or other student populations inequitably impacted by pandemic disruptions. Despite these limitations, this report offers a pulse check on the academic performance of students nationwide.

Conclusion

Results from the current study offer two important reminders: Academic recovery is not done, and the path of academic recovery is not a universal experience. Though trends largely mirror those of the prior spring, there were places in which there were small but encouraging increases in the proportion of students on grade level. Similarly, prior research demonstrated pockets of recovery, suggesting alignment between intervention and population (Young, 2024; Young & Young, 2024a).

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Though many districts experienced challenges in implementing interventions at the appropriate dosage and scale, when implemented "successfully," students saw benefits (Carbonari et al., 2024; Nickow et al., 2024; Young, 2024). We also know from prior research that setting ambitious goals for students and supporting their growth toward said goals can help students achieve grade-level proficiency, even for students well below grade level (Rome & Daisher, 2023; Curriculum Associates, 2023c). Identifying places in which recovery may be occurring and practices that assisted this recovery are important next steps to encouraging recovery at a larger scale. Examining data with a more nuanced lens and detecting unique patterns in recovery can help support this endeavor.

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APPENDIX

Assessment Measure

The *i-Ready Diagnostic* was developed to serve several purposes: 1) establish a metric that will allow for an accurate assessment of student knowledge that can be monitored over a period of time to gauge student improvement, 2) accurately assess student knowledge for different content strands within each subject, 3) provide information on what skills students are likely to have mastered and likely need to work on next, and 4) link the assessment results to instructional advice (Curriculum Associates, 2018).

Upon completion of the Diagnostic, each student's results are reported as scale scores, placement levels, and norm-referenced percentile scores. *i-Ready Diagnostic* scale scores are linear transformations of logit values. For each assessment in reading and mathematics, an overall score is calculated, as are domain scores for each content strand. Scale scores can range in value from 100 to 800. In *i-Ready*, the placement is an on-grade level interpretation of the scale score (Curriculum Associates, 2018). When a student's scale score is within the range for their grade level, their placement level is designated as Early On Grade Level, Mid On Grade Level, or Late On Grade Level. If the scale score is below or above the range for the grade level, the placement level is designated as Grade X (with X corresponding to the appropriate grade level). The scale score ranges that correspond to each placement level by subject, domain, and grade are listed in the *i-Ready* scale score placement tables.

The mean standard error of measurement (SEM) for overall scores across grade levels is low in both the reading (e.g., 9.3–10.9) and mathematics (e.g., 6.3–6.5) assessments, with many approaching the theoretical minimum SEM. The item response theory analogue to classical reliability estimation is called marginal reliability and operates on the variance of the theta scores and the mean of the expected error variance (Samejima, 1977; Sireci et al., 1991). This marginal reliability uses the classical definition of reliability as a proportion of variance in the total observed score due to true score. The true score variance is computed as the observed score variance minus the error variance. Like a classical reliability coefficient, the marginal reliability estimate increases as the SEM decreases; it approaches 1 when the SEM approaches 0. The estimated reliability for reading is .97, and the estimated reliability for mathematics is .96 (Curriculum Associates, 2018).

The results from several linking studies support the strong external validity of the *i-Ready Diagnostic*. *i-Ready* scores correlate closely with Lexiles®, Quantiles®, and state assessments when the tests were taken within a short period of time, and the results on the fall and winter *i-Ready Diagnostic* correlations with spring state assessments also show high correlations (most at .90 and higher).

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Appendix Figure 1. *i-Ready* Placement-Level Descriptors

	Three or More Grade Levels Below	Two Grade Levels Below	One Grade Level Below	Early On Grade Level	Mid or Above Grade Level	
Placement Relative to Grade-Level College- and Career-Readiness Standards	Are not close to meeting			Only partially met	Met	
Instructional Recommendations	**Likely need intensive intervention of foundational concepts**	**May need intensive intervention** of material that is **two grade levels below** to help fill in gaps in students' foundational knowledge	**May benefit from review or remediation of material** that is **one grade level below**	**Will benefit from on-grade level instruction** to help them meet the expectations of college- and career-readiness standards for their grade level	**Mid On Grade Level:**	Will benefit from instruction in late on-grade level topics
					Late On Grade Level:	Will benefit from late on-grade level enrichment and will be ready for instruction focused on topics typically covered in the beginning of the subsequent grade level
					Above Grade Level:	Will benefit from above-grade level instruction

Appendix Table 1. Percentage of Students On Grade Level in Reading by Domain

Grade	2018-2019	2021-2022	2022-2023	2023-2024
High-Frequency Words				
K	79%	70.7%	70.5%	69.2%
1	78.9%	68.6%	72.7%	72.9%
Phonological Awareness				
K	86.2%	81%	81%	81.1%
1	77.2%	70.4%	66.4%	61.7%
Comprehension: Informational Text				
K	85.7%	78.4%	77.3%	77.9%
1	64.5%	55.8%	54.4%	53.9%
2	63.5%	51.7%	50.8%	48.8%
3	66.6%	57.8%	56.4%	55%
4	52.8%	48.5%	46.9%	45.9%
5	48.2%	46.6%	45.7%	45.4%
6	44.3%	44.4%	44.2%	43.5%
7	45%	47.4%	45.9%	46%
8	45.3%	48.6%	47.3%	46.8%
Comprehension: Literature				
K	87%	80.8%	79.5%	80.1%
1	65%	56.1%	55%	55.4%
2	64.6%	54.2%	53.5%	52.3%
3	69.4%	61.3%	60%	59.4%
4	59.1%	55.3%	54%	53.2%
5	54.1%	52.8%	52.6%	52%

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Grade	2018-2019	2021-2022	2022-2023	2023-2024
6	47%	47.7%	48.1%	47.3%
7	46.8%	49.1%	48.7%	48.8%
8	46.5%	49.5%	49.4%	49.3%
Comprehension: Overall				
K	79.1%	70.8%	80.3%	80.7%
1	55.8%	45.5%	54.4%	54.4%
2	54.6%	43.8%	52.9%	51.3%
3	60.2%	51.9%	58.8%	57.7%
4	45.1%	42.2%	50.2%	49.5%
5	40.5%	39.4%	49.2%	48.7%
6	36.9%	37%	46.4%	45.8%
7	37.2%	39.2%	47.8%	47.8%
8	36.3%	39.4%	49%	48.6%
Vocabulary				
K	79.7%	72.6%	72.3%	72.6%
1	60.5%	53%	52.6%	53.5%
2	57.8%	51.9%	53%	52.6%
3	66.2%	61.5%	60.8%	61%
4	50.2%	50.5%	50.3%	50.2%
5	44.4%	44.5%	45.1%	45.3%
6	45.2%	43.9%	44.5%	44.4%
7	49.3%	48.5%	47.8%	48.4%
8	51.8%	50.3%	49.1%	49.3%

Appendix Table 2. Percentage of Students Below Grade Level in Reading by Domain

Grade	2018-2019	2021-2022	2022-2023	2023-2024
High-Frequency Words				
K	0%	0%	0%	0%
1	2.3%	5.1%	5.4%	5.7%
Phonological Awareness				
K	0%	0%	0%	0%
1	1.7%	3.5%	3.6%	3.7%
Comprehension: Informational Text				
1	2.1%	4.5%	4.9%	5.1%
2	9%	14.7%	14.6%	15.9%
3	15.3%	23.6%	24.7%	25.5%
4	16.9%	21.6%	23.1%	24.3%
5	28.9%	30.8%	32.1%	33.1%
6	35.7%	34.9%	36.1%	37.3%
7	39.4%	36%	37.8%	37.9%
8	38.4%	34.5%	35.8%	36.6%

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Grade	2018-2019	2021-2022	2022-2023	2023-2024
Comprehension: Literature				
1	1.7%	3.7%	4.1%	4.2%
2	8.2%	14.4%	14.3%	15%
3	14.2%	21.7%	22.6%	23.1%
4	14.2%	18.9%	20.4%	21.3%
5	22.4%	25.4%	26.5%	27%
6	29.1%	29.5%	30.1%	31.1%
7	35.8%	33.7%	34.5%	34.8%
8	35.2%	32.5%	33%	33.6%
Comprehension: Overall				
1	3.2%	6.5%	3.5%	3.8%
2	12.2%	20.1%	13.4%	14.4%
3	19.3%	27.9%	22.9%	23.6%
4	20.4%	25.1%	21.1%	22%
5	33.6%	35.5%	29%	29.8%
6	41.2%	40.4%	32.6%	33.7%
7	45.1%	42.1%	35.4%	35.7%
8	44.2%	40.6%	33.5%	34.1%
Vocabulary				
1	2.4%	5%	5.2%	5.3%
2	8%	13.9%	13.6%	13.9%
3	13.8%	19.3%	20.1%	19.9%
4	13.3%	16.3%	17.5%	17.9%
5	24.3%	25.7%	25.9%	26.3%
6	31%	30.5%	30.3%	30.9%
7	33.1%	32.1%	33%	32.7%
8	31.5%	31.4%	32.2%	32.2%

Appendix Table 3. Percentage of Students On Grade Level in Mathematics by Domain

Grade	2018-2019	2021-2022	2022-2023	2023-2024
Algebra and Algebraic Thinking				
K	74.5%	67%	66.7%	67.7%
1	76.2%	65.4%	65%	64.2%
2	63.9%	54.5%	54.9%	53.8%
3	72.1%	60.7%	60.6%	60.7%
4	72.4%	58.6%	59.9%	59.4%
5	55.6%	48.2%	49.1%	48.7%
6	54.3%	48.5%	49.5%	49.3%
7	44.5%	40.2%	41.2%	42%
8	42.7%	38.4%	39.2%	40.4%

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Grade	2018-2019	2021-2022	2022-2023	2023-2024
Geometry				
K	84.7%	67.1%	69.2%	69.5%
1	68.2%	53.1%	55.4%	53.1%
2	65.9%	51.2%	53.8%	53.1%
3	57.2%	45.2%	43.5%	43.7%
4	63.6%	47.8%	47%	47.4%
5	59.4%	47.4%	49.1%	48.8%
6	51.5%	44.7%	43.7%	43.2%
7	43%	37.5%	37%	36.2%
8	42.5%	37.7%	37.8%	37.3%
Measurement and Data				
K	80.5%	64.1%	63.2%	63.1%
1	64.6%	52.6%	52%	50.6%
2	65%	54.1%	54.4%	53.5%
3	68.5%	55.8%	55.4%	55.6%
4	70.2%	55%	55.6%	56%
5	69.8%	56.7%	56.8%	56.3%
6	60.6%	51.9%	52.7%	51.9%
7	53.4%	49%	49%	48%
8	48.8%	46.4%	47.1%	45.9%

Appendix Table 4. Percentage of Students Below Grade Level in Mathematics by Domain

Grade	2018-2019	2021-2022	2022-2023	2023-2024
Algebra and Algebraic Thinking				
1	1.6%	4.2%	4.2%	4.3%
2	3.1%	7.7%	7.2%	7.7%
3	6%	11.6%	11.6%	11.7%
4	9.6%	16.5%	16.5%	16.9%
5	12.2%	18.8%	19.3%	19.3%
6	19%	24.6%	24.5%	24.9%
7	27.8%	32.6%	32.7%	32.8%
8	32.4%	37.6%	38%	37.4%
Geometry				
1	1.7%	5.9%	5.7%	5.8%
2	7.5%	14.9%	13.7%	14.5%
3	7.6%	13.1%	13.2%	13%
4	13.4%	22.4%	22.2%	22.2%
5	16.2%	24.5%	24.1%	23.9%
6	20.9%	29.5%	28.6%	28.7%
7	28.1%	35.8%	35.6%	36.1%
8	33.2%	37.6%	38.6%	39.7%

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Grade	2018-2019	2021-2022	2022-2023	2023-2024
Measurement and Data				
1	2.5%	6.6%	6.9%	7.1%
2	6.3%	12.5%	12.1%	12.9%
3	9.4%	15.6%	16.1%	16%
4	11.2%	19.5%	19.2%	19.3%
5	12.9%	20.3%	20.8%	20.9%
6	17.1%	23.8%	24%	24.5%
7	22.7%	28.8%	29.3%	29.8%
8	27%	32.5%	32.4%	33.1%

Appendix Table 5. Fall and Spring Scale Scores

Grade	2018-2019		2021-2022		2022-2023		2023-2024	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Reading								
K	348	406	346	396	342	397	343	398
1	405	460	398	447	396	449	395	448
2	461	504	448	491	449	495	449	493
3	499	532	489	522	487	521	487	520
4	530	554	523	549	521	547	520	546
5	551	572	547	568	547	568	546	567
6	569	585	568	583	568	583	566	581
7	583	596	585	598	584	596	583	595
8	596	607	598	610	596	608	596	607
Mathematics								
K	346	383	340	372	338	372	338	372
1	378	411	372	401	369	401	369	401
2	404	434	396	423	396	424	395	423
3	427	457	420	447	420	447	420	447
4	451	476	440	465	441	465	442	465
5	467	486	457	477	458	478	459	478
6	479	495	472	488	472	489	472	489
7	489	501	483	496	483	496	483	496
8	498	509	492	504	491	505	492	505

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Appendix Table 6. Fall-to-Spring Growth Overall and by Fall Grade-Level Placement

Grade	All Students				On Grade Level				Below Grade Level			
	2018-2019	2021-2022	2022-2023	2023-2024	2018-2019	2021-2022	2022-2023	2023-2024	2018-2019	2021-2022	2022-2023	2023-2024
Reading												
K	57	51	55	55	49	43	50	49				
1	55	49	53	53	48	44	48	46	68	56	58	58
2	42	42	46	44	30	31	36	34	50	45	51	51
3	33	33	34	33	25	25	26	27	43	40	42	40
4	25	26	26	26	18	17	17	17	35	35	36	35
5	21	21	21	21	15	12	12	12	28	29	28	29
6	16	15	15	15	9	8	7	7	22	23	22	22
7	13	13	12	12	6	6	5	5	20	20	20	20
8	11	12	12	11	3	5	4	4	20	20	20	20
Mathematics												
K	37	32	34	35	28	22	25	25				
1	33	29	32	32	28	18	23	24	44	40	41	42
2	29	27	28	28	22	18	21	21	33	31	33	32
3	30	28	28	27	28	25	27	27	32	30	29	30
4	26	25	24	24	24	24	24	24	28	25	24	24
5	19	20	20	19	18	20	20	19	22	20	20	19
6	16	17	17	16	16	18	18	18	17	16	16	16
7	12	13	13	13	13	15	15	15	13	13	13	14
8	11	12	13	14	10	12	13	13	12	12	14	14

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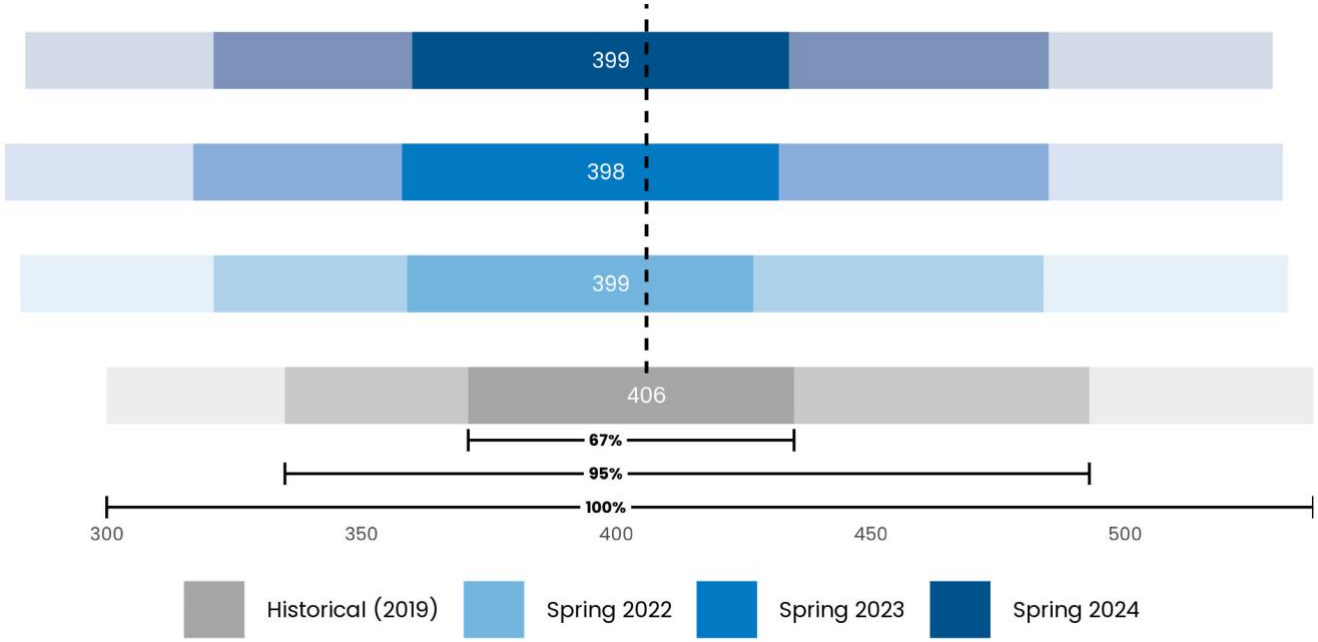
Appendix Figure 2. Spring Scale Score Variability–Grades K–8 Reading

Note: Values represent the median of each distribution, with the historical median plotted across each with a dotted line. The shaded areas represent the ranges in which 67%, 95%, and 100% of the scores fall.

Grade K Reading



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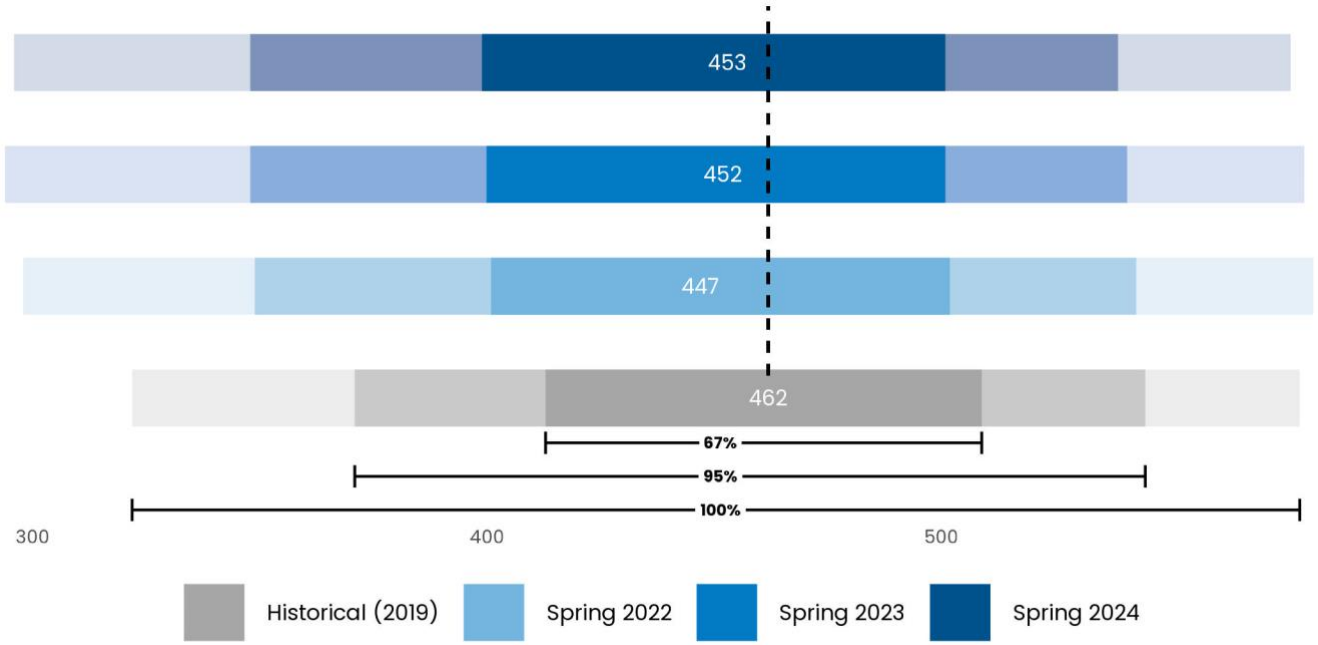

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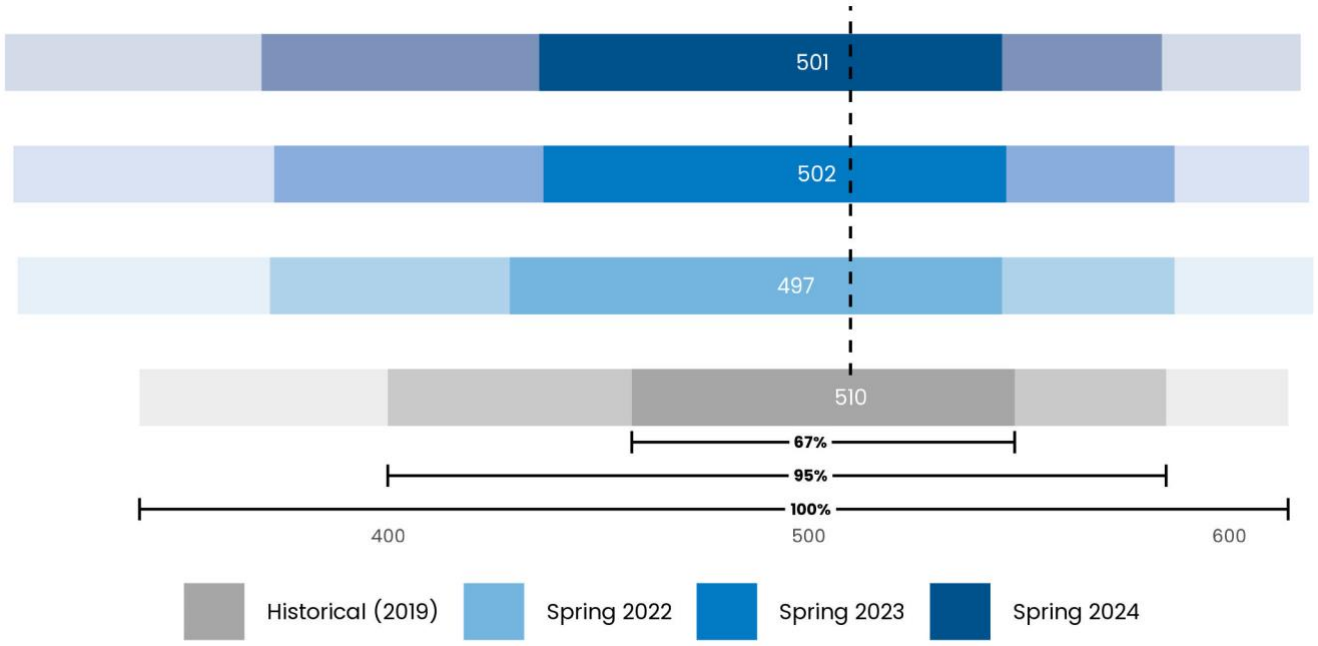
Grade 2 Reading



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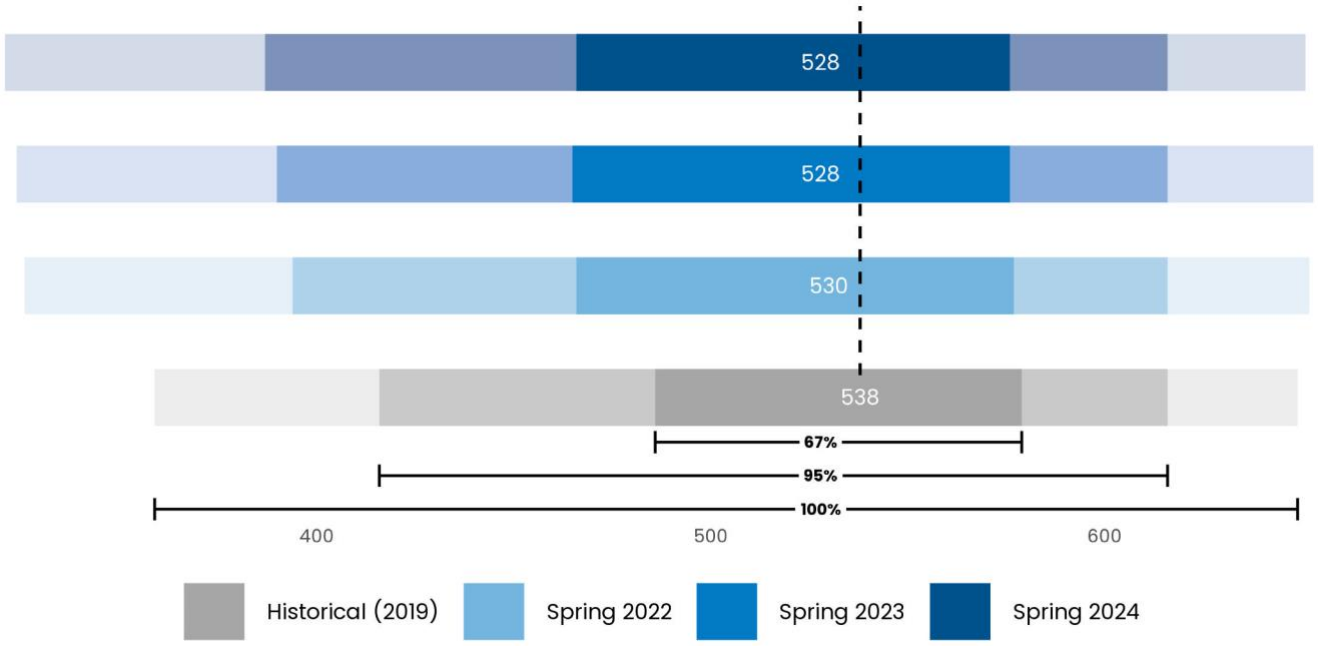

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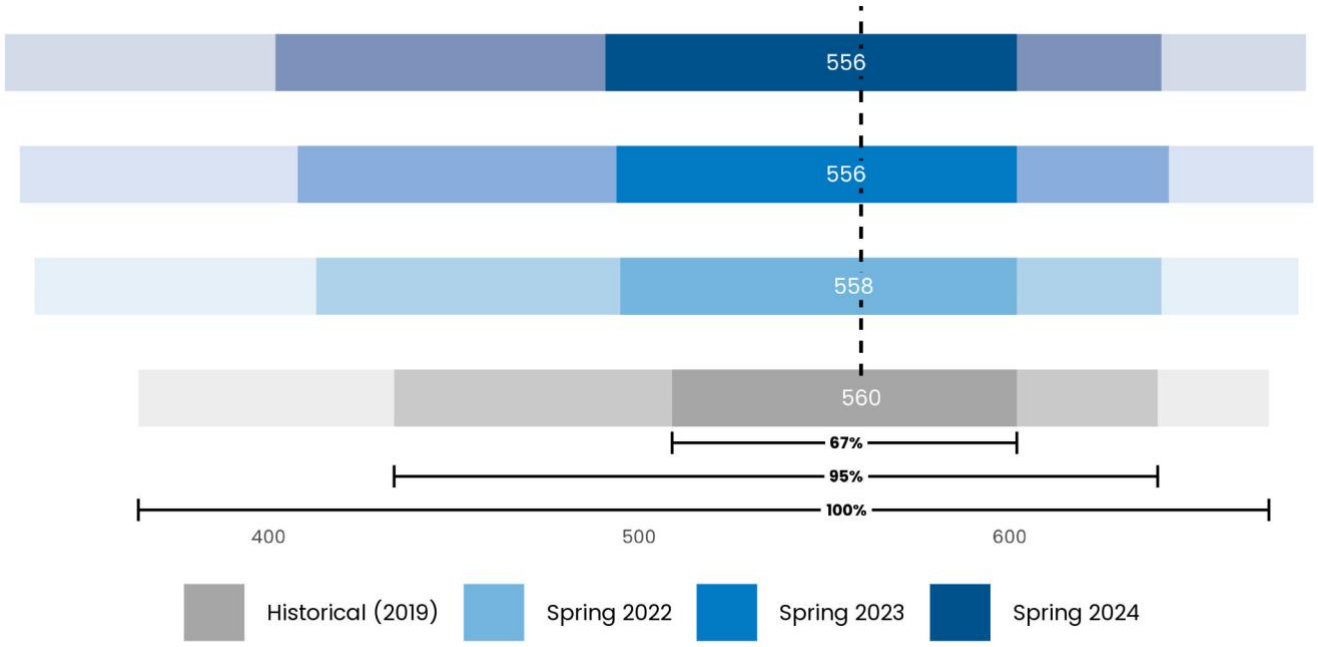
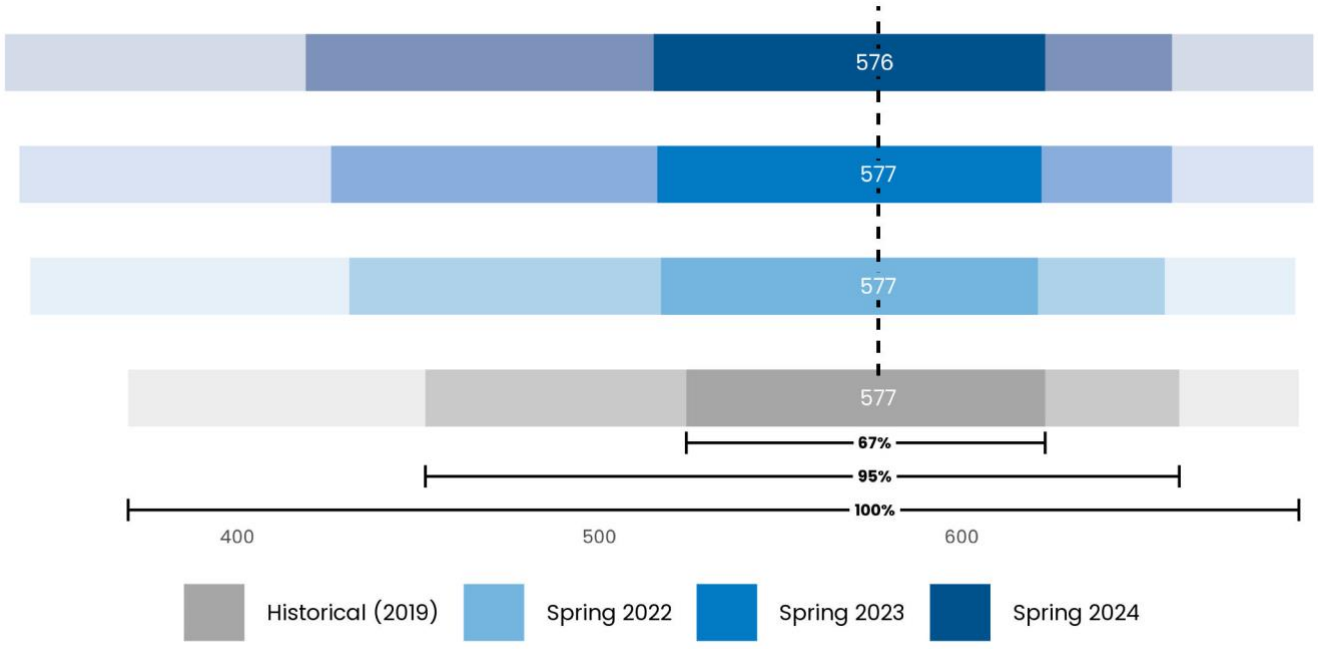
Grade 4 Reading



Grade 5 Reading



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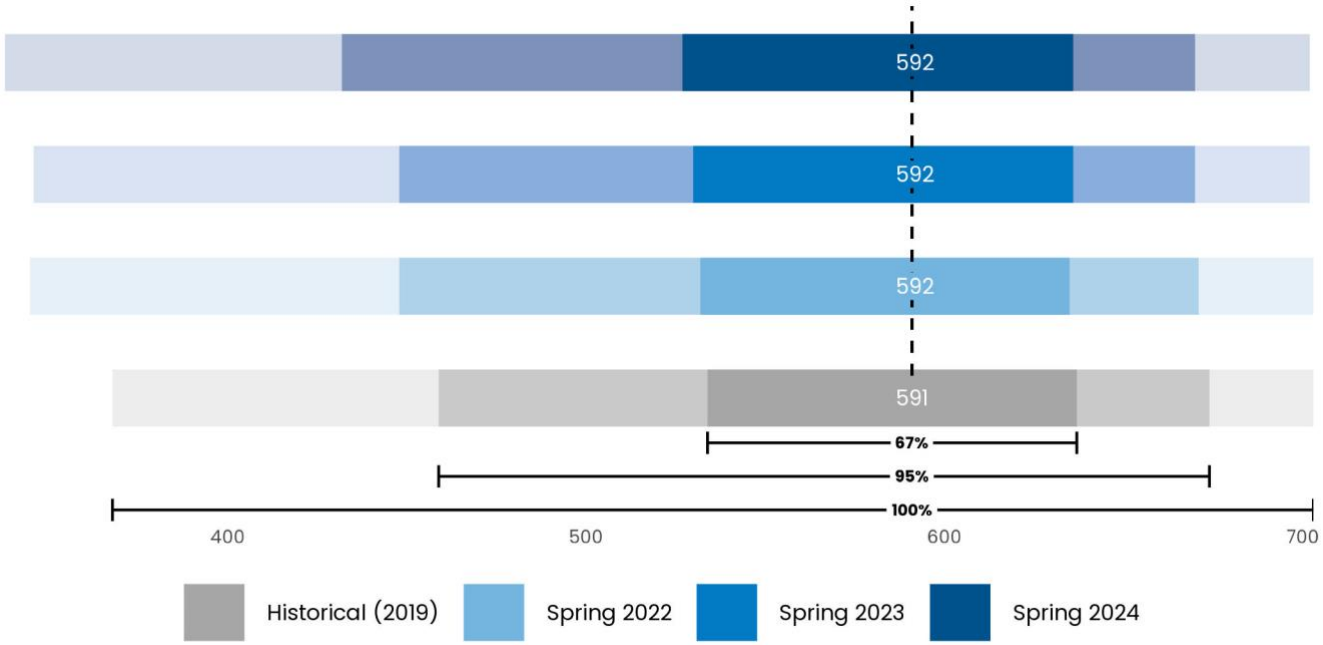
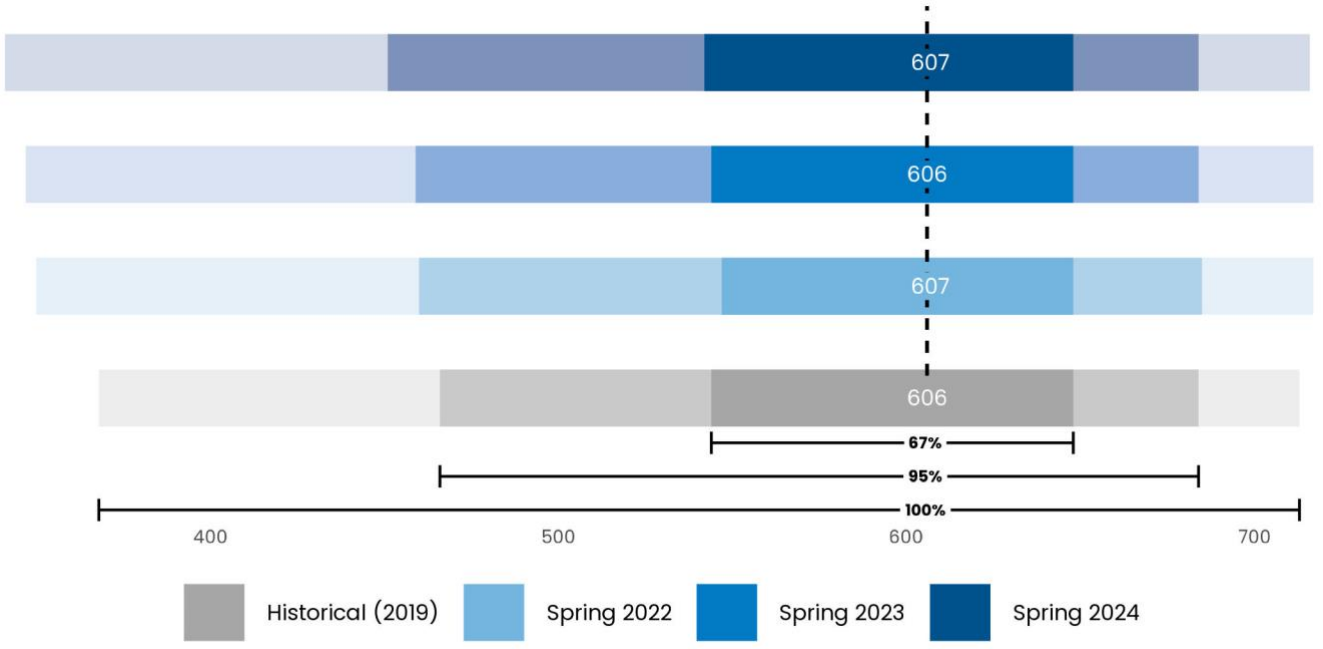
Grade 6 Reading



Grade 7 Reading



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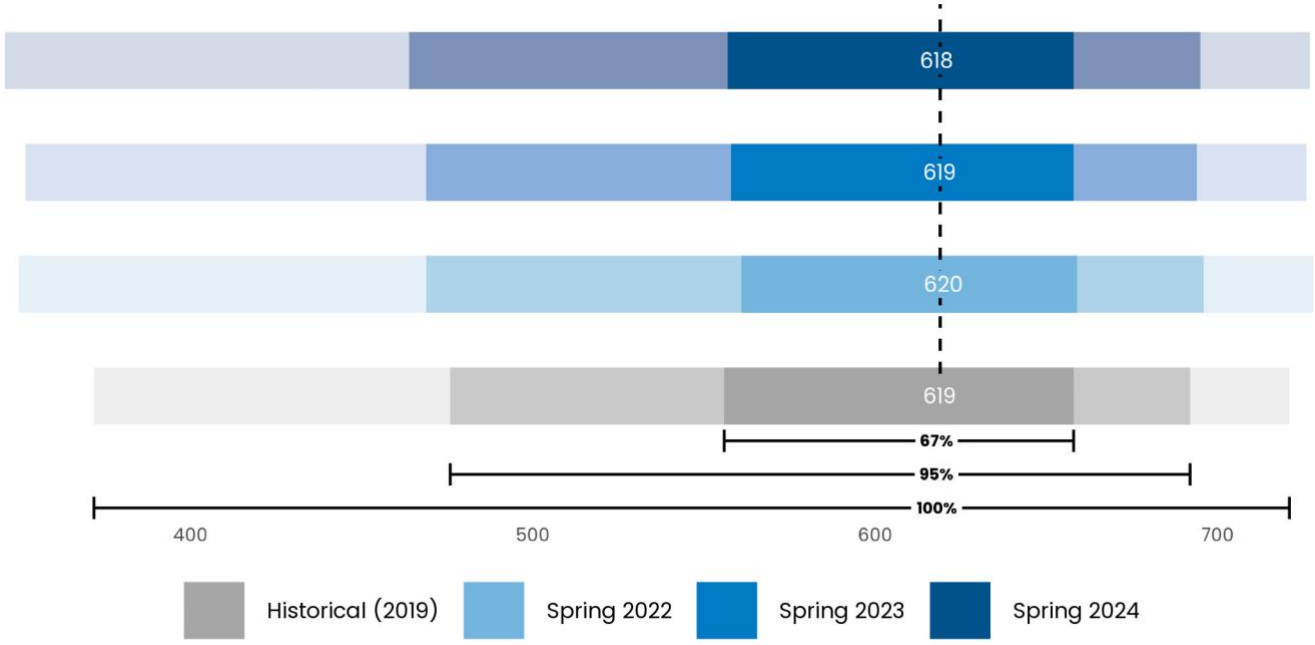
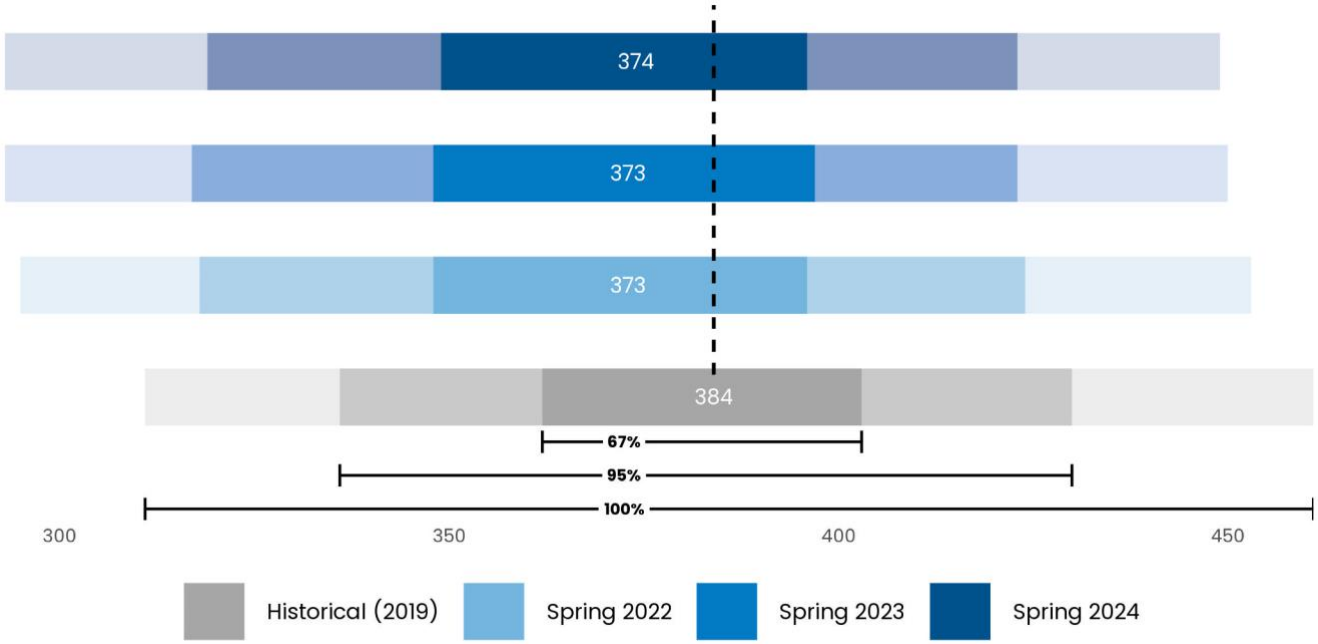
Grade 8 Reading



Appendix Figure 3. Spring Scale Score Variability–Grades K–8 Mathematics

Note: Values represent the median of each distribution, with the historical median plotted across each with a dotted line. The shaded areas represent the ranges in which 67%, 95%, and 100% of the scores fall.

Grade K Mathematics



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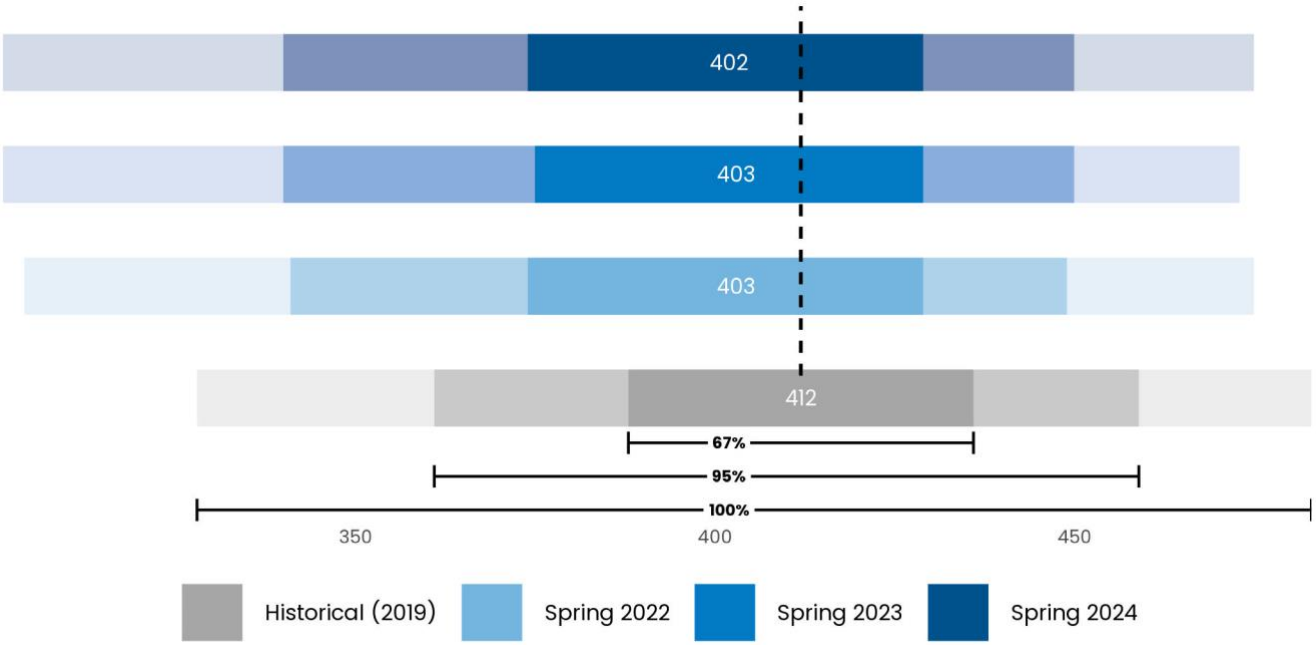
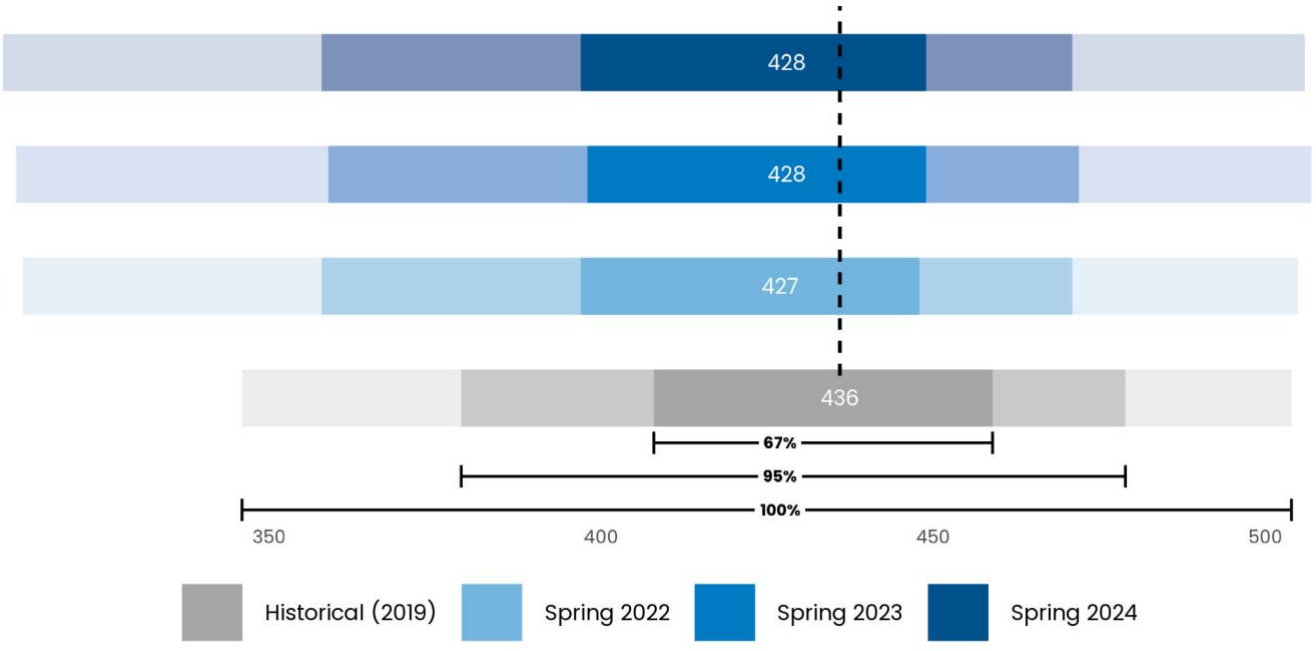
Grade 1 Mathematics



Grade 2 Mathematics



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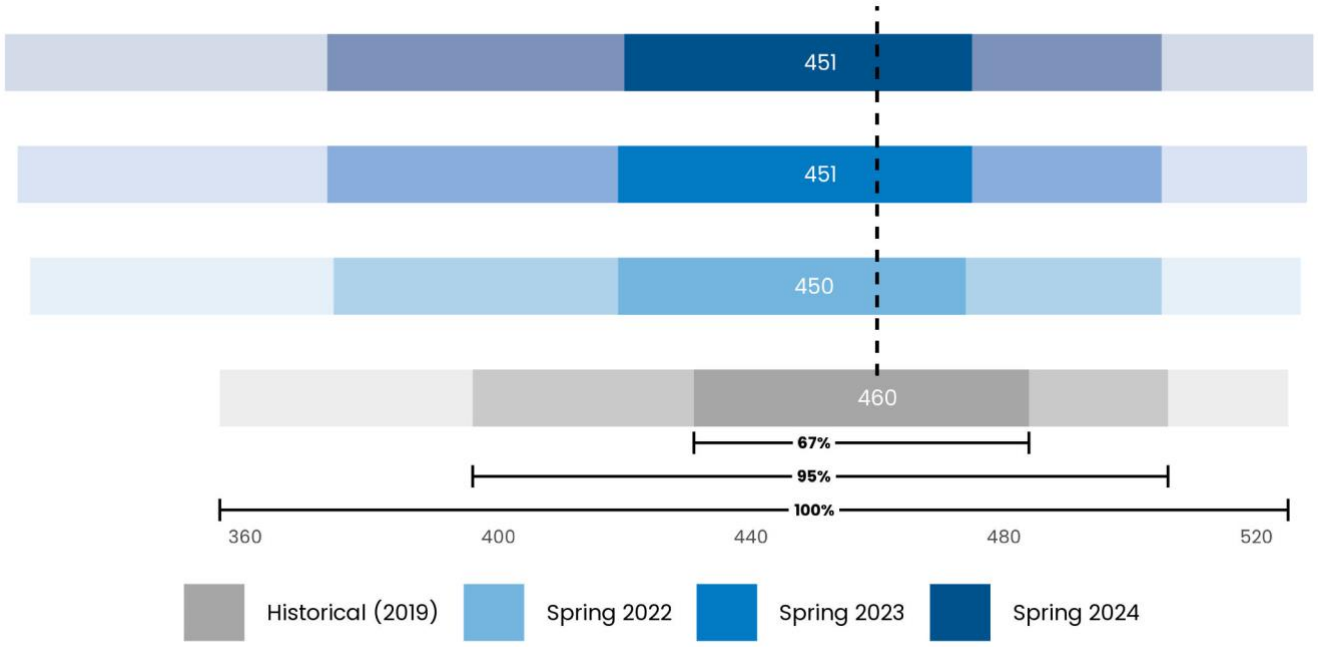
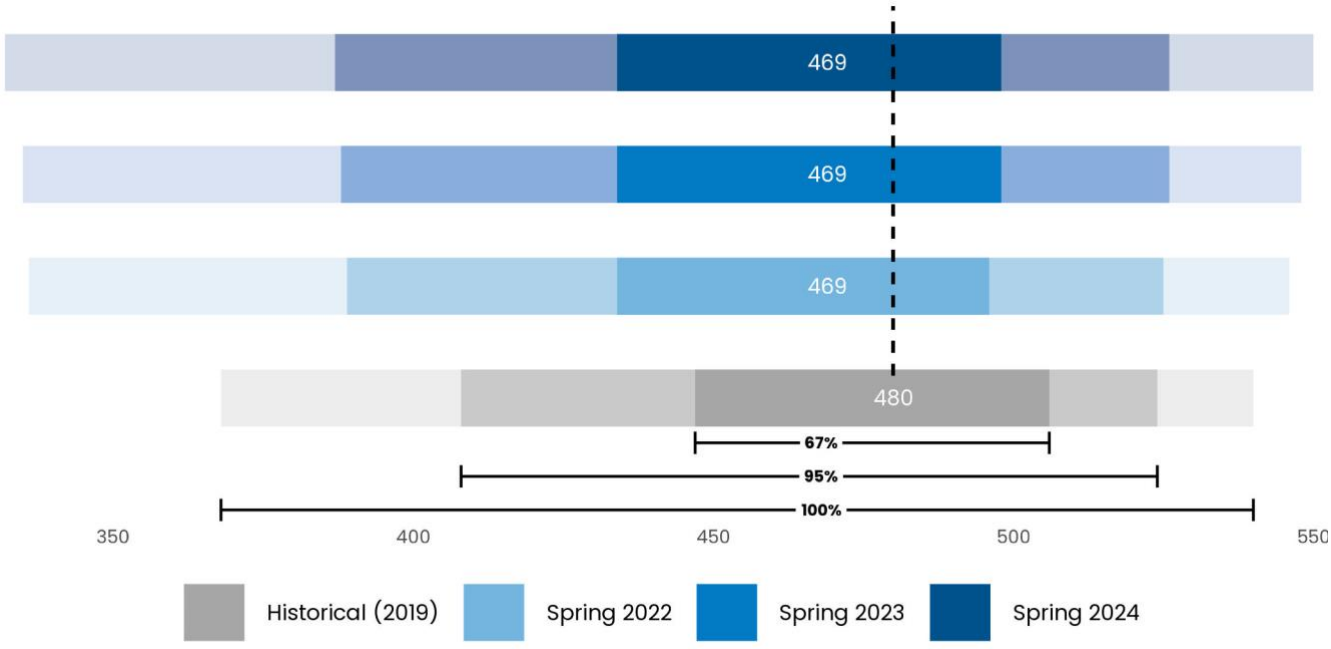
Grade 3 Mathematics



Grade 4 Mathematics



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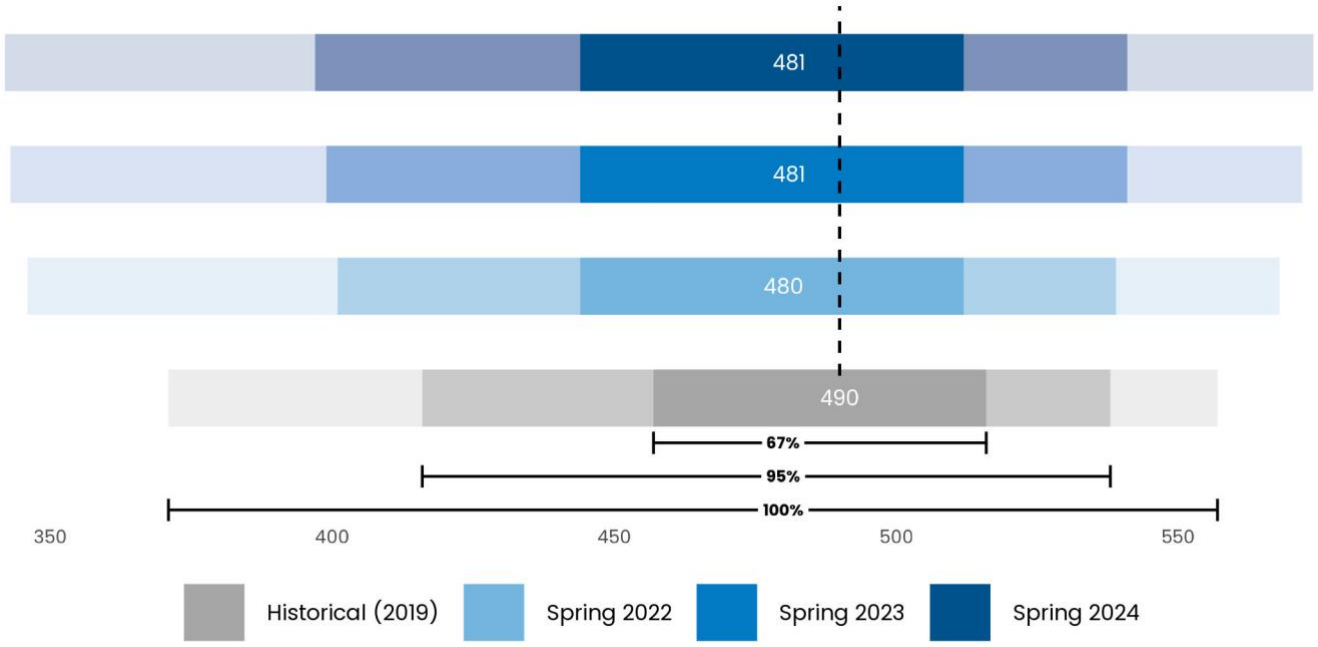
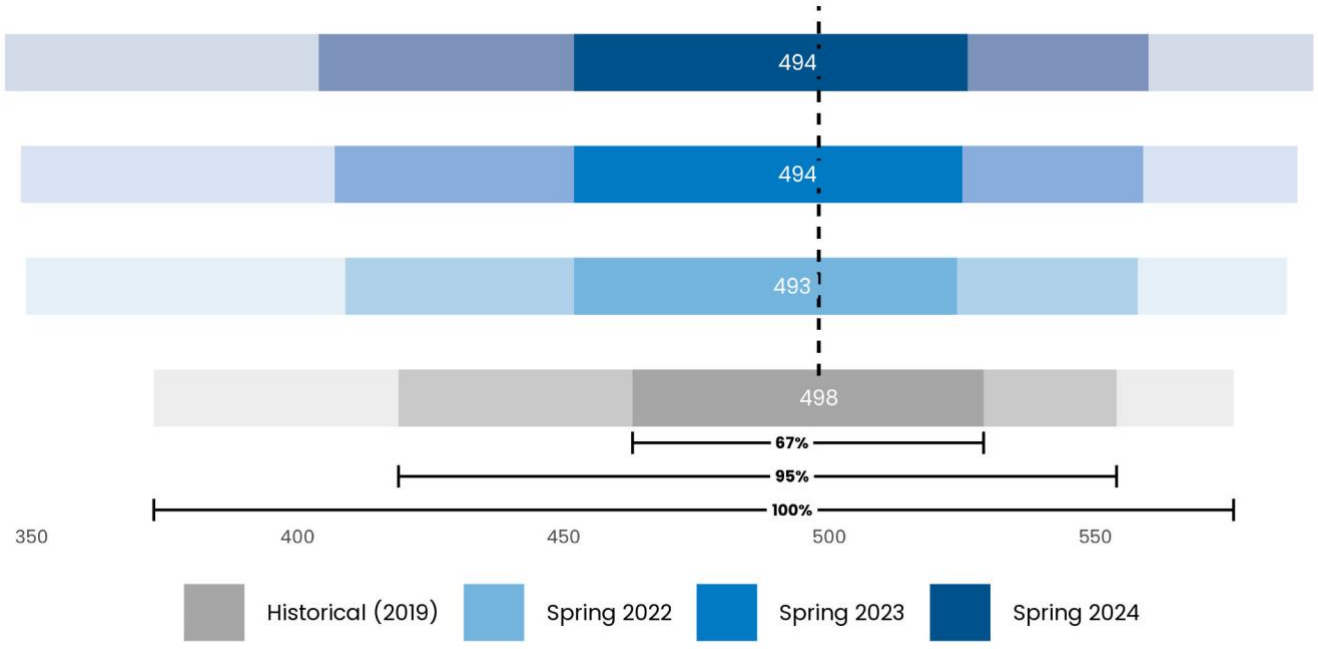
Grade 5 Mathematics



Grade 6 Mathematics



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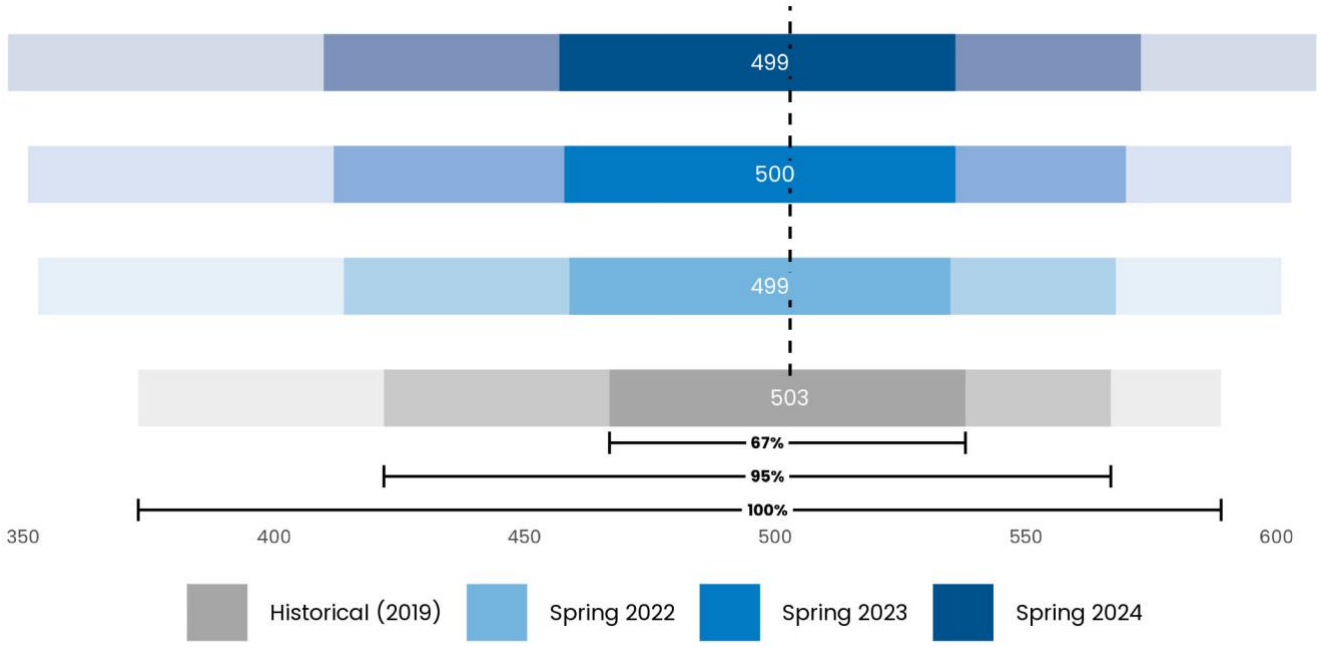
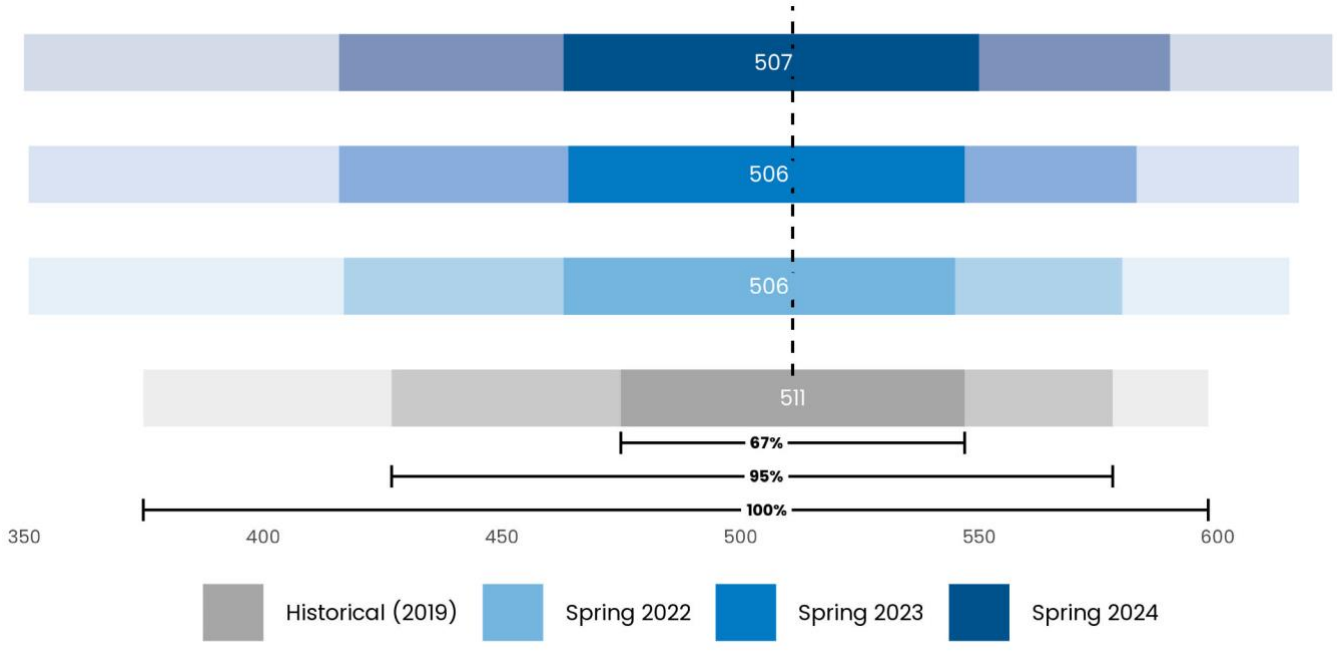
Grade 7 Mathematics



Grade 8 Mathematics



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