Report on Math Proficiency

Joint Chairmen's Report Page 172

June 2023

MARYLAND STATE DEPARTMENT OF EDUCATION
EQUITY AND EXCELLENCE

MARYLAND STATE DEPARTMENT OF EDUCATION

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Foreword

This comprehensive report addresses the elements required in the Joint Chairman's Report Information Request for a report from the Maryland State Department of Education (MSDE) on math proficiency in Maryland. The report encompasses contextual background information on math assessment in Maryland and math proficiency data and lays out future professional learning opportunities for the next two school years. It should be noted that the complete data to establish a baseline for this report and MSDE's efforts will be released in August 2023, following the release of the Spring 2023 assessment results, after which this report will be updated accordingly.

MCAP DATA RELEASE AND SETTING THE BASELINE FOR MATH PROFICIENCY

The spring of 2022 was the first full implementation of the Maryland Comprehensive Assessment Program (MCAP) for mathematics. MSDE undertook a one-time standard-setting process, as federally required of all new assessments, which delayed the release of results until January of 2023. MSDE will receive final math results from the assessment vendors on the same timeline as Maryland's local education agencies (LEAs), on July 28. With the Spring 2023 MCAP results, new baselines will be set to ensure that all students are progressing in mathematics.

Date	Format and Location	Event
April 25, 2023	LEA Access to Report in Secure Assessment System	Preliminary Reporting Category Roster
July 28, 2023	LEA Access to Report in Secure Assessment System	Individual Student Report (pdf version) Every Student Every Activity (ESEA) file without growth
August 11, 2023	Report Available in Secure Assessment System	Final Reporting Category Roster Reporting Category Summary Demographic Performance Level Summary Item Analysis Reports
August 25, 2023	Report Available in Secure Assessment System	Evidence Statement Analysis Content Standards Roster (ELA and Mathematics)
August 31, 2023	State Access to Data Provided via a secure file transfer system	Growth Data
September 22, 2023	Mailed to LEA/Schools	Individual Student Report (Printed)

Joint Chairmen's Report Information Request

The 2023 Joint Chairmen's Report includes report language for the Maryland State Department of Education's (MSDE) Headquarters Operating Budget in the Office of the Deputy for Teaching and Learning (R00A01.03) pertaining to math proficiency in Maryland schools.

REPORT REQUEST

Maryland's Fiscal Year 2024 Operating Budget (HB200 of 2023) requires the Maryland State Department of Education (MSDE) to:

> *provided that $50,000 of this appropriation for the Maryland State Department of Education may not be expended until the agency submits a report by July 1, 2023, outlining the State's plan to address math proficiency. It is the intent of the General Assembly that the plan be implemented in the 2023-2024 school year and include specific accountability measures that would be put into effect should individual local education agencies or individual schools fail to improve math proficiency scores within two academic years. The budget committees shall have 45 days from the date of the receipt of the report for review and comment. Funds restricted pending the receipt of the report may not be transferred by budget amendment or otherwise to any other purpose and shall revert to the General Fund if the report is not submitted to the budget committees.*

The Joint Chairmen's Report of 2023 further explains:

> *This language restricts funds for the Maryland State Department of Education (MSDE) for a report on the State's plan to address math proficiency in the 2023-2024 school year.*

MSDE RESPONSE

MSDE addresses the requirements of this report, as follows:

- Providing the historical evolution of mathematics assessments in Maryland, tracing the shift from the Partnership for Assessment of Readiness for College and Careers (PARCC) to the Maryland Comprehensive Assessment Program (MCAP), and the introduction of computer-adaptive testing, alongside a focus on the impact of state and federal educational accountability systems in ensuring equitable and continuous improvement in mathematics achievement across the state;
- Conducting a comprehensive analysis of the decline in mathematics achievement, utilizing the MCAP and the National Assessment of Educational Progress (NAEP) to highlight state-specific patterns and broader national trends, and emphasizing the importance of a nuanced understanding of student growth;
- Implementing a comprehensive Blueprint Implementation Plan template and Criteria for Success for local education agencies (LEAs) anchored in high-quality instructional materials and interventions in mathematics;
- Implementing high-quality, differentiated professional learning year-round, designed by MSDE's Math Content Team, to provide enhanced teaching and learning practices for mathematics instruction and student outcomes, and build capacity for educators across the state;
- Leveraging state and federal funds as well as a partnership with the Governor's Service Year to seed a Maryland Tutoring Corps focused on a robust, math-based, statewide high-quality, school day tutoring approach starting in the 2023-2024 school year;

- Providing legislative recommendations for supporting math acceleration and instruction; and
- Employing carefully crafted incentives to encourage LEAs to adopt effective math intervention strategies and leveraging the mechanisms built into current state law and regulations to ensure accountability, remedy implementation shortfalls, and enhance student achievement, particularly for historically underserved groups.

Executive Summary

The landscape of mathematics education in Maryland is in a phase of dynamic change, underscored by a determined focus on reversing the persistent downward trend in mathematics achievement. This executive summary, while outlining the changes and challenges experienced in the last decade in math assessments, casts a keen eye on the broader scope of initiatives and strategies that the Maryland State Department of Education (MSDE) is employing to bolster mathematics achievement. The State's approach underscores a commitment to equity and high-quality instruction, especially targeting the needs of historically underserved groups.

MSDE is putting into motion an array of impactful solutions, from innovative assessment methods to comprehensive instructional models and focused professional learning opportunities. These strategies pivot around a central goal: to address and reverse the systemic issues affecting math achievement, particularly for students in underserved communities. This summary presents an overview of these initiatives, delving into key programs such as the Maryland Tutoring Corps, the Blueprint for Maryland's Future, and legislative recommendations aimed at bolstering mathematics achievement. Readers should explore this summary review of MSDE's proactive approach to enhancing mathematics education in the Executive Summary, understanding that the details of these plans, strategies, and their impact will be further elaborated in the sections that follow.

HISTORY OF MATH ASSESSMENTS IN MARYLAND

The last decade has seen a seismic shift in mathematics assessments in Maryland, marked by two significant transitions - from the adoption of the Common Core State Standards to the introduction of the Maryland Comprehensive Assessment Program (MCAP). The initial key change was the implementation of the Partnership for College and Career Readiness (PARCC) assessments, an outcome of Maryland joining the PARCC consortium in 2010. The adoption of the Common Core State Standards, the groundwork for Maryland's College and Career Ready Standards, initiated a cascade of transformative steps. Professional development programs on the new standards, curriculum adjustments, and extensive field tests were implemented from 2011 through 2014, paving the way for the operational administration of the PARCC assessments in 2015. The annual administration of these tests continued until 2019, with the first set of results being reported in 2016.

Another transformative phase in Maryland's math assessment landscape was the shift to the Maryland Comprehensive Assessment Program (MCAP). Announced in 2018, the MCAP implementation process was delayed due to the COVID-19 pandemic and was only completed in 2022. The transition period was characterized by challenges, particularly in adapting to new computer-based testing methods. Despite the initial difficulties, including the necessity for students to answer the first question correctly and ensuring widespread access to computers and broadband, the implementation of MCAP signaled an innovative approach to math assessments, prioritizing adaptive learning and technological fluency.

The MCAP assessments were first administered with a shortened version of the tests in early Fall 2021. However, this implementation produced limited data and therefore did not support a standard-setting process. Full implementation took place in Spring 2022, followed by standard-setting in the summer through early fall of the same year. Spring 2022 data reporting was delayed due to the required standard-setting process. With the Spring 2023 assessment, reporting returns to an earlier release of results during the summer after the administration of the assessment.

MATHEMATICS STATE ASSESSMENTS IN MARYLAND

Maryland has witnessed a significant decrease in student mathematics achievement, according to the analysis of both the Maryland Comprehensive Assessment Program (MCAP) and the National Assessment of Educational Progress (NAEP) data. This declining trend, which was notable even before the onset of the COVID-19 pandemic, aligns with a concerning nationwide downturn in mathematics proficiency. Furthermore, the drop in performance is not solely restricted to students already underachieving but also includes those students already below proficiency.

Significant disparities exist among various demographic groups, with the achievement gaps between different racial and ethnic groups, as well as socioeconomic groups, remaining wide and persistent. Proficiency levels across all groups are still considerably lower than the pre-pandemic rates.

This report's analysis extends beyond the straightforward assessment of proficiency rates to a broader conceptualization of student achievement, including a particular focus on students who were on the cusp of proficiency. This more nuanced perspective is essential in understanding student growth potential and providing a holistic view of the mathematical proficiency landscape in Maryland. Furthermore, the chapter places Maryland's progress within the larger national context, highlighting the interplay between local and national trends in math achievement. As such, the chapter stands as a comprehensive examination of the decrease in math achievement and its implications, thereby offering valuable insights for education stakeholders and policymakers.

BLUEPRINT AND MATHEMATICS INSTRUCTION

Through the Blueprint, MSDE designed a template that required LEAs to think systematically to raise the bar in mathematics achievement. Following the pandemic's negative impacts on student learning and achievement in mathematics specifically, the Department designed a Blueprint Implementation Plan template and a Criteria for Success, which was unanimously adopted with marginal changes from the Accountability and Implementation Board (AIB). The plan required school systems to think comprehensively when delivering math instruction and to present comprehensive plans which included the adoption of high-quality instructional material across all tiers of instruction, ensuring all educators engage in ongoing training and professional learning, and implementing opportunities for school day tutoring.

Under the aegis of the Blueprint for Maryland's Future Pillar 3, College and Career Readiness, and Pillar 5, Accountability and Governance, MSDE followed its statutory obligation in enhancing comprehensive mathematics instruction by designing a Blueprint Implementation Plan template and Criteria for Success that prioritized mathematics. The template compels LEAs to devise actionable plans that include high-quality, evidence-based comprehensive mathematics instruction, thus ensuring a proactive approach toward improving student math achievement.

As part of these plans, LEAs are required to align their mathematics instructional program with Maryland College and Career Standards, identify culturally responsive, high-quality instructional materials for all grade levels in math, and set forth a detailed process for ongoing professional development and instructional support. Concurrently, the Blueprint Implementation Plan template mandates LEAs to offer a comprehensive approach for Tier 2 and Tier 3 math instruction, inclusive of high-quality, school day tutoring. With these strategies, framed within the MSDE-designed Blueprint Implementation Plan template for LEAs, Maryland will make significant strides in elevating mathematics instruction and student achievement across the state.

MATHEMATICS PROFESSIONAL LEARNING OPPORTUNITIES

The MSDE Math Content Team will design and implement a variety of ongoing, high-quality, job-embedded professional development for math educators across the state. Some examples include middle school math lesson studies, elementary math learning labs, leading for math administrator sessions, revamping the federally required Comprehensive Support and Improvement (CSI) school plan process to require LEAs and school leaders to be more intentional and strategic about student outcomes in mathematics, and additional differentiated professional learning sessions responsive to MCAP data.

MSDE Mathematics Lesson Study initiative will be piloted with middle school math teams from two LEAs and will later expand to additional LEAs and grade levels. The lesson study teams will work through two lesson study cycles, including planning, teaching, observing, reflecting, and refining. Participating in the lesson study process will provide school teams the opportunity to work collaboratively to develop and improve planning instruction that strategically aligns with student proficiency in targeted standards. The Mathematics Learning Labs will provide opportunities for elementary educators from across the state to work collaboratively on an identified problem of practice. Educators will have opportunities to observe instruction in other LEAs, hear from experts on the selected topic, and work collaboratively with educators from other LEAs and with district-based teams to develop strategies that, when implemented with fidelity, will result in improvements in teaching and learning.

Additional professional learning opportunities will include more targeted content learning. As an example, instructional strategies that address modeling and reasoning with mathematics have been identified as an area of need. A learning series will be designed to provide opportunities for mathematics educators to focus on ways to improve the teaching and learning of modeling and reasoning with mathematics. A similar structure will be used for providing professional learning on the use of evidence-based mathematical instructional strategies such as assessment data analysis and action planning, literacy in mathematics, and scaffolded mathematics instruction. The Math Content Team will also continue to support LEA math leaders through quarterly collaborative meetings and additional opt-in learning opportunities designed in response to MCAP data analysis.

MARYLAND TUTORING CORPS

In response to the protracted impact of the COVID-19 pandemic on students' math proficiency, MSDE launched the competitive Maryland Tutoring Corps grant program in June 2023. Backed by the American Rescue Plan Elementary and Secondary School Relief Funds, the program aims to mitigate long-term learning loss by investing in high-quality, school day tutoring programs for secondary math students, particularly those who are most underserved. The program will leverage grants to LEAs who will partner with higher education institutions to recruit, train, and deploy tutors. MSDE anticipates an amplified impact due to a 2-1 match component, potentially raising the total investment from $10 million to $30 million. The primary focus of the tutoring is middle school students (grades 6-8), students in any grade enrolled in Algebra I, and historically underserved student groups.

The initiative builds on a significant body of research indicating that high-quality, school day tutoring, particularly in mathematics, can significantly enhance student learning. Program applications must present a detailed plan aligning with the Maryland Tutoring Corps program goals and the expected impact on math proficiency. The plans must demonstrate substantial progress toward improving math proficiency and narrowing the achievement gap, especially for historically underserved student groups. In addition, applicants need to support the development of systems for launching and scaling high-quality, school day tutoring. In line with national trends, math scores in Maryland have declined significantly since the onset of the pandemic. High-quality tutoring has been shown to offer accelerated achievement and foster positive relationships with schools. The Maryland Tutoring Corps program envisions the establishment of tutoring as an accessible, equitable, and

effective intervention, aiming to mitigate pandemic-induced learning loss, and narrow and close achievement gaps.

LEGISLATIVE RECOMMENDATIONS

In collaboration with the State Board of Education, the Maryland State Department of Education (MSDE) is dedicated to reversing the trend of declining math proficiency rates in the state. Recognizing the need for transformative legislation, MSDE supported two significant legislative initiatives in the 2023 session: The Maryland Promise Schools program and the Maryland Neighborhood Tiers system.

The Maryland Promise Schools program, proposed under Senate Bill 814, aims to establish a robust, statewide framework to transform persistently low-performing schools, using an evidence-based approach. This approach, proven effective in other states such as Michigan and Massachusetts, supports the acceleration of student outcomes and educator success. The bill's success rests on a well-defined implementation process, continuous funding, and stringent accountability measures to ensure that the program is applied rigorously and consistently. Importantly, the bill also ensures the availability of options for students at schools that continue to underperform after three years.

House Bill (HB) 1211 introduced the Maryland Neighborhood Tiers system, which seeks to tackle the disparities in student poverty and teacher quality. It improves the measurement of student poverty by incorporating neighborhood indicators, providing a more precise understanding of student needs, and facilitating the alignment of funding with these needs. Moreover, MSDE proposed amendments to the bill that would establish the Teacher Designation System, which aims to identify, retain, and incentivize high-quality educators, particularly in high-need schools. This legislation draws on the successful implementation of similar programs in states like Texas and Ohio, proposing that teacher incentives can improve the distribution of high-quality educators and boost student achievement in areas of concentrated poverty.

MSDE also emphasizes the importance of a robust accountability system, aligning with the Every Student Succeeds Act, to ensure progress toward state educational goals and to highlight areas requiring improvement, particularly for those students who have been historically underserved. A legislative update to the state's accountability system is necessary to ensure Maryland schools are striving for and being held to accountability goals that will ensure student growth for all Maryland students. By focusing on the intersection of poverty, teacher quality, and accountability, these legislative proposals promise to enhance student achievement and narrow opportunity and achievement gaps across Maryland's schools. The accountability system's role extends beyond identifying struggling students to diligently track progress and directing resources and interventions effectively. By advocating for a shift in the narrative around school success, the accountability system should focus not merely on proficiency rates but also on growth and improvement, offering a more holistic perspective. The system should also promote a well-rounded education, considering multiple aspects such as school quality, student success indicators, and the provision of an enriched curriculum. Ultimately, MSDE envisions an accountability system that enables a comprehensive evaluation of school performance, helping to ensure educational equity and continuous improvement for all students in Maryland.

ACCOUNTABILITY

MSDE has established accountability measures within state law to address any instances where LEAs fail to meet implementation targets and milestones. These mechanisms include the LEA funding withholding provisions of the Blueprint, overseen by the Accountability and Implementation Board, as well as the involvement of Expert Review Teams. As a state education agency, MSDE will utilize all available existing policy tools in collaboration with the Maryland State Board of Education to ensure accountability. While MSDE does not have

direct operational oversight over Maryland's LEAs and individual schools, it will take action within the authority it has to uphold accountability and drive positive outcomes.

MSDE is determined to strengthen its efforts toward ensuring the comprehensive readiness of each student for post-secondary success. The Every Student Succeeds Act (ESSA) and the Maryland Accountability System form a foundation in the effort towards achieving these ambitious educational goals. ESSA is instrumental in offering a benchmark for the measurement of progress towards state-defined educational goals, ensuring that the performance of schools and LEAs is meticulously assessed.

A History of Mathematics Assessment in Maryland

Math assessments in Maryland have seen major changes during the last decade, from the implementation of the Partnership for College and Career Readiness (PARCC) assessments, administered as operational tests from 2015 to 2019, to the transition to the Maryland Comprehensive Assessment Program (MCAP), announced in 2018 but delayed due to the impact of the COVID-19 pandemic. The implementation process of the MCAP mathematics assessments was completed in 2022.

The Partnership for College and Career Readiness (PARCC)

Maryland adopted the Common Core State Standards in English language arts (ELA) and Mathematics in 2010. In that same year, Maryland joined other states in the PARCC consortium to build a new assessment aligned with the Common Core State Standards.

The Common Core State Standards were the foundation for Maryland's new state curriculum framework, Maryland's College and Career Ready Standards, developed by MSDE in collaboration with educators, administrators, and higher education representatives. During 2011 and 2012, MSDE conducted professional development on the new standards and provided transition time for LEAs to write or purchase new curricula and adjust instruction.

MSDE conducted a field test administration of the PARCC assessments in elementary and middle schools in 2013, followed by field testing in high schools in 2014. The first operational administration of the PARCC assessments took place in 2015. PARCC results were first reported in 2016 after performance standards were set and cut scores were identified to place students in each performance level. Since 2015, PARCC assessments were administered every year until 2019.

The Transition to Maryland Comprehensive Assessment Program (MCAP)

In 2018, MSDE announced the transition from the PARCC assessments to MCAP. By introducing MCAP, the state would be able to reduce testing time for students, while ensuring the validity of the assessments to assess Maryland content standards as mandated by state and federal requirements.

The development of MCAP began in January 2019, with a pilot initially slated for December 2019. However, the rollout of MCAP was delayed due to the COVID-19 school closures starting in March 2020. Recognizing the impact of the pandemic on educational systems, the U.S. Department of Education granted states, including Maryland, waivers for its accountability systems in SY 2019-2020 and SY 2020-2021. In addition, Maryland obtained flexibility and additional waivers allowing the state to implement short-term changes to its accountability system for reporting Maryland School Report Cards in SY 2021-2022.

Computer Adaptive Testing

In traditional, linear tests, all students are tested on the same questions, and most questions are designed to be at a medium level of difficulty. Results from these tests have greater accuracy in measuring ability for students in the mid-range of student ability. However, the test scores may have a greater margin of error for those students who are either struggling or are more advanced compared to their peers. By contrast, in a computer-adaptive test, the questions are tailored to each student. After answering a question, a student may encounter a harder or an easier question based on the difficulty level of prior questions and the number of questions answered correctly up to that point. This allows for greater precision in measuring ability across the range of student abilities. For students, it means that their test scores reflect more accurately what they know and can

do. For educators, it means that test results become more helpful to identify which students may need greater support and which students may be ready for more advanced work. Since a computer-adaptive test is customized to each student's ability level, all students will experience an adequate level of challenge. Even though all questions are aligned to grade-level standards, students who are struggling may encounter questions to which they readily know the answer. Conversely, more advanced students may encounter questions that they are unsure how to answer.

In SY 2021-2022, all MCAP mathematics assessments were fixed-form tests. In Spring 2023, a computer-adaptive test was introduced in grades 3 to 8, and Algebra I. The fixed form of the test is still administered in Algebra II and Geometry, and it remains available for any student who needs accessibility features or requires this format based on their approved accommodations. English learners who are approved to be assessed in Spanish also take the fixed form of the test.

MCAP Mathematics

MCAP mathematics assessments include general education assessments in grades 3 to 8, Algebra I, Geometry, and Algebra II. The MCAP mathematics assessments are available online and in accommodated forms in both paper and online (i.e., Braille, ASL, Spanish, and Text-to-Speech). There are also alternate mathematics assessments administered in Grades 3 to 8 and 11 for students for whom the general state assessments are not appropriate, even with accommodations.

MCAP mathematics tests are structured into four sections of 40 minutes each, resulting in a total Section Testing Time of 160 minutes. MSDE sets an annual calendar with statewide testing windows for general education and alternate assessments. Within the state testing windows, LEAs have the flexibility to schedule the tests, determine how many days students will be tested, and whether students should take multiple sections in a day.

The Maryland State Department of Education (MSDE) is determined to heighten its efforts toward ensuring the comprehensive readiness of each student for post-secondary success. To this end, they underscore the integral role of accountability systems in achieving these ambitious educational goals. The Every Student Succeeds Act (ESSA), forms a foundation in this effort. ESSA is instrumental in offering a benchmark for the measurement of progress towards state-defined educational goals, ensuring that the performance of schools and LEAs is meticulously assessed.

Moreover, MSDE emphasizes the power of a robust accountability system in addressing opportunities and achievement gaps among various student groups, a long-standing challenge in the educational landscape of Maryland. The accountability system's role extends beyond identifying struggling students to diligently track progress and direct resources and interventions effectively. By advocating for a shift in the narrative around school success, the accountability system should focus not merely on proficiency rates but also on growth and improvement, offering a more holistic perspective. The system should also promote a well-rounded education, considering multiple aspects such as school quality, student success indicators, and the provision of an enriched curriculum. Ultimately, MSDE envisions an accountability system that enables a comprehensive evaluation of school performance, helping to ensure educational equity and continuous improvement for all students in Maryland.

Mathematics Proficiency Data in Maryland

The role of student achievement in mathematics has remained a cornerstone for assessing academic progress and school effectiveness. In recent years, an issue of concern that has emerged is a visible decrease in math achievement in Maryland, a trend that predates the disruptions of the COVID-19 pandemic. This chapter offers a comprehensive examination of this ongoing issue, exploring various dimensions of student performance and how they intersect with larger national trends.

To provide a comprehensive understanding, MSDE utilizes a dual approach harnessing both the Maryland Comprehensive Assessment Program (MCAP) and the National Assessment of Educational Progress (NAEP). The MCAP offers specific insights into local patterns, while the NAEP situates Maryland's progress within the broader national context. In addition to an examination of proficiency rates, this combined analysis also places particular emphasis on a broader conceptualization of student achievement, including consideration of students who were on the cusp of proficiency. This inclusion helps to capture a more nuanced picture of student growth and the potential for progress. With this approach, the following sections will delve deeper into the nature, causes, and implications of the decrease in math achievement starting from 2021 and continuing into 2022, a decline that aligns with larger trends observed across the nation.[1] [2]

STUDENT PERFORMANCE IN MATHEMATICS

All MCAP assessments have four student performance levels: Beginning Learner, Developing Learner, Proficient Learner, and Distinguished Learner. Students who earn a scale score that places them in Performance Level 3 (Proficient) and Performance Level 4 (Distinguished) are aggregated to determine the percentage of students that are considered proficient.

From 2016, the second year of the PARCC, to 2019, the last PARCC administration, about a third or more of the students assessed in mathematics 3 to 8 were proficient. The percentage dropped to 16% with the first, shortened administration of the MCAP assessments in 2021, following the pause in assessments due to the COVID-19 pandemic. In 2022, the first year of full implementation of the MCAP assessments, the percentage of students proficient in mathematics in grades 3 to 8 went up to 22.3% (see Chart 1). The decrease in math achievement in Maryland starting in 2021 and continuing into 2022 is consistent with a nationwide trend as a result of the pandemic.[3] [4]

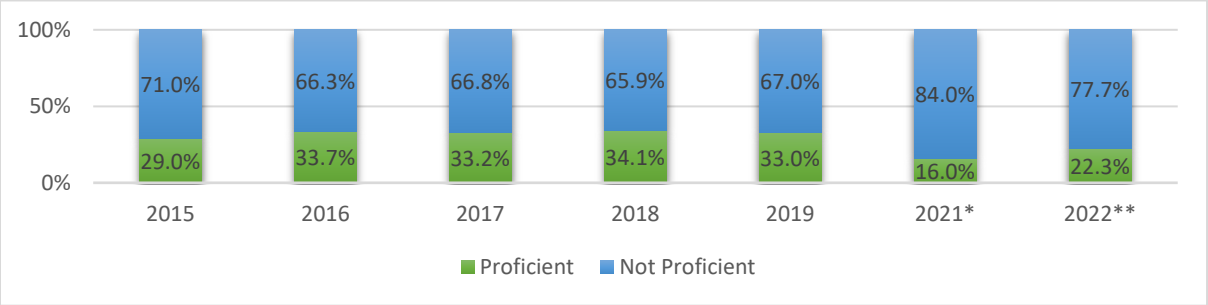
[1] APPENDIX FOOTNOTE 1

[2] APPENDIX FOOTNOTE 2

[3] APPENDIX FOOTNOTE 1

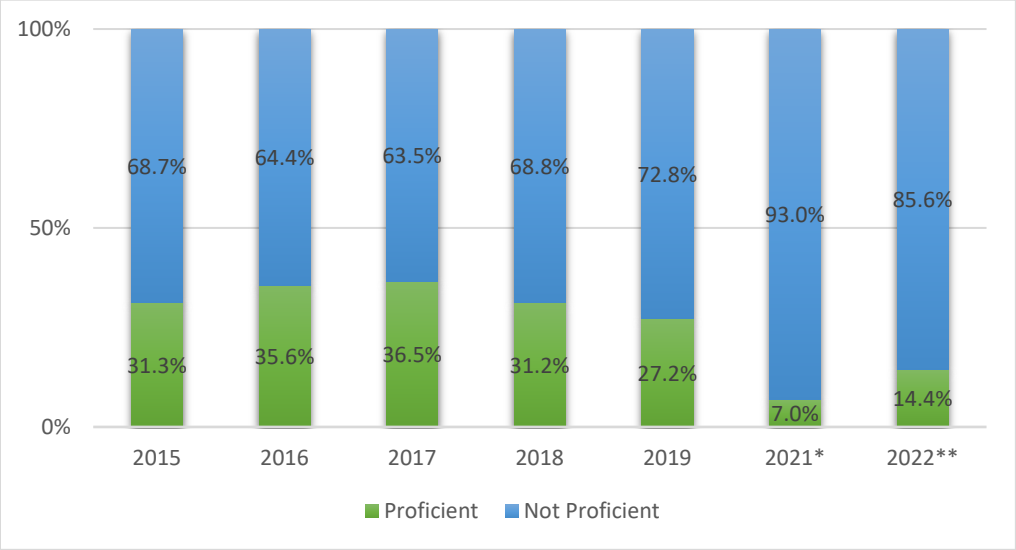
[4] APPENDIX FOOTNOTE 2

Chart 1: Mathematics 3-8 Proficiency Rates by Year



For the students who were assessed in Algebra I, the percentage of students proficient started at 31.5% in 2015, when the PARCC was first administered, and reached 36.5% two years later. However, student performance experienced a downward movement in both 2018 and 2019. The administration of the MCAP assessments after the pandemic pause brought a steep decline in performance, with only 7% and 14.4% of students considered proficient, respectively, in Fall 2021 and Spring 2022 (see Chart 2).

Chart 2: Algebra I Proficiency Rates by Year

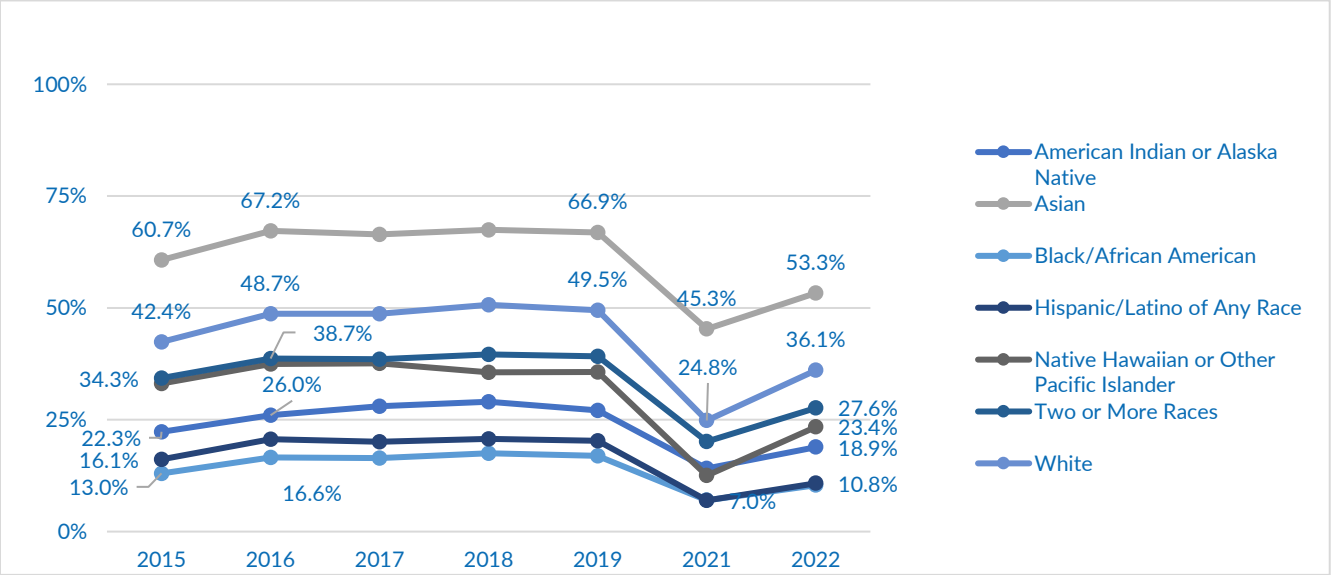


PERFORMANCE BY RACE/ETHNICITY

When proficiency rates are disaggregated by race/ethnicity, the data show substantial performance gaps between student groups. For all student groups, proficiency rates in mathematics in grades 3 to 8 experienced only minor movements from 2015 to 2019, followed by a steep decline in 2021, ranging from almost 25 percentage points for White students to close to 10 percentage points for Black/African American students. Furthermore, for all student groups, proficiency rates partially recovered in 2022, but remained substantially below pre-pandemic levels.

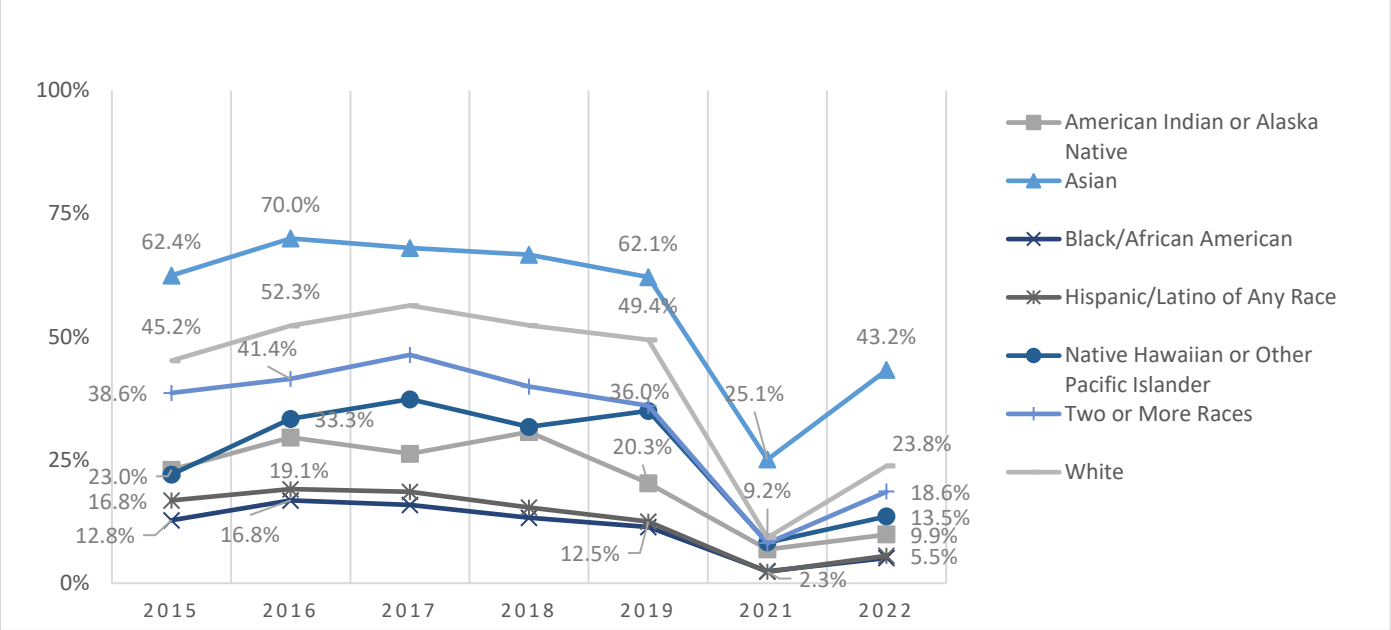
However, some of the student groups were far apart from each other in their starting and ending points. In 2016, 67.2% of Asian students and 48.7% of White students were proficient in mathematics 3 to 8, compared to 20.7% of Hispanic/Latino students and 16.6% of Black/African American students. In 2022, the proficiency rates for Asian students and White students dropped, respectively, to 53.3% and 36.1%. In that same year, only 10-11% of Hispanic/Latino and Black/African American students were considered proficient (see Chart 3).

Chart 3: Mathematics 3-8 Proficiency Rates by Race/Ethnicity



Proficiency rates in Algebra I also showed substantial performance gaps when disaggregating the data by race/ethnicity. In 2016, 70% of Asian students and 52.3% of White students achieved proficiency in Algebra I, compared to 19.1% of Hispanic/Latino students and 16.8% of Black/African American Students. After dipping substantially in 2021, the proficiency rates for Asian students and White climbed to 43.2% and 23.8%, respectively, in 2022. By comparison, 5% to 5.5% of Hispanic/Latino students and Black/African American students were proficient in Algebra I in 2022.

Chart 4: Algebra I Proficiency Rates by Race/Ethnicity

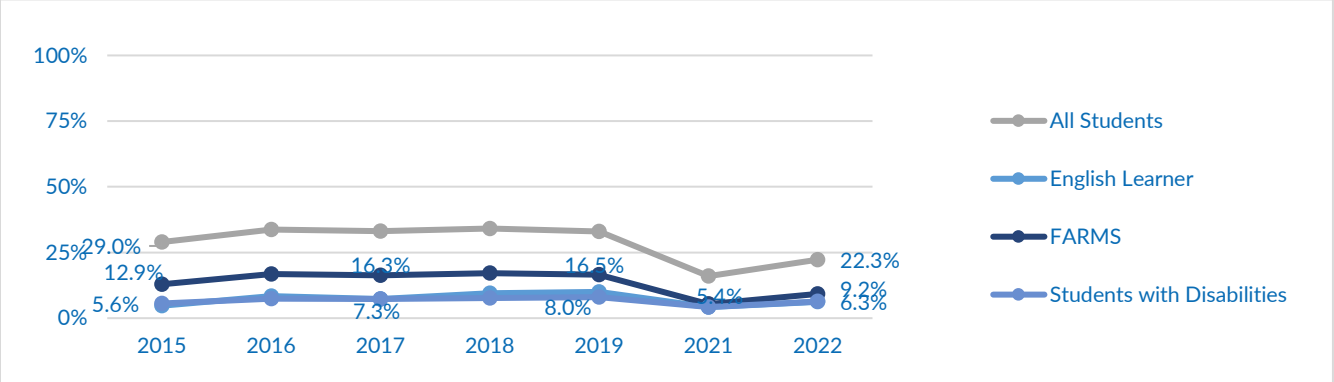


PERFORMANCE BY A STUDENT GROUP

The longitudinal data on student performance also shows persistent gaps between student groups. From 2016 to 2022, the average proficiency rate in mathematics 3 to 8 for all students was twice as high as the corresponding rate for students receiving Free and Reduced Price Meals (FARMS), 33.5% compared to 16.7%. In 2021, performance for all student groups worsened, while the performance gap between all students and FARMS students diminished to 10.6 percentage points. However, in 2022, all groups experienced gains in proficiency and the gap rose to 13 percentage points.

Similarly, there was an average performance gap of 24.7 percentage points between all students and English Learner students during 2016-2019. While the gap fell to 11.8 percentage points in 2021, it surpassed 16 percentage points one year later. The gap in performance for students with disabilities compared to students without disabilities showed similar consistency in the pre-pandemic years, followed by a downward and upward movement in 2021 and 2022, respectively (see Figure 5).

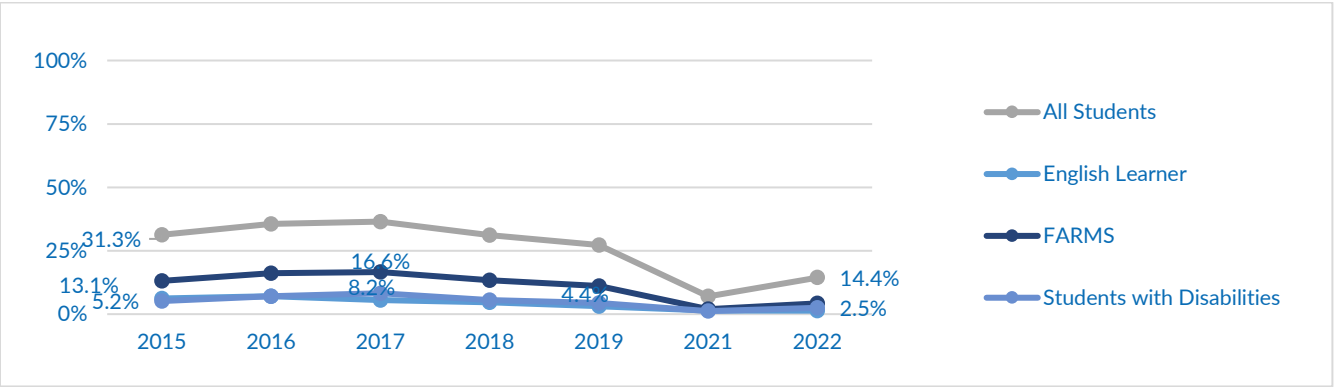
Chart 5: Mathematics 3-8 Proficiency Rates by Student Group



From 2015 to 2019, there was an average gap of 18.3 percentage points between all students and FARMS students in the proficiency rates in Algebra I. In 2021, performance declined sharply for all student groups and the gap between all students and FARMS students contracted to five percentage points. However, in 2022, as overall performance improved, the gap expanded again to 10.1 percentage points.

The comparison between all students and English Learner students shows an even larger average performance gap in Algebra I from 2015 to 2019. During this period, the proficiency rate for English learners was, on average, 27 percentage points lower than the proficiency rate for all students. In this case, too, the performance gap dropped to 5.6 percentage points in 2021 but rose sharply again the following year. A similar pattern can be seen when comparing performance over time for students with disabilities and students without disabilities (see Figure 6).

Chart 6: Algebra I Proficiency Rates by Student Group



PERFORMANCE BY LOCAL EDUCATION AGENCY

Statewide, the percentage of students that scored proficient in math in grades 3 through 8 in the school year 2021-2022 was 22% but, as Chart 7 shows, this varied across Maryland's 24 LEAs from a low of 7% in Baltimore City to a high of 38% in Carroll County.

Chart 7: Mathematics Grades 3-8 Proficiency Rates by Local Education Agency, 2022

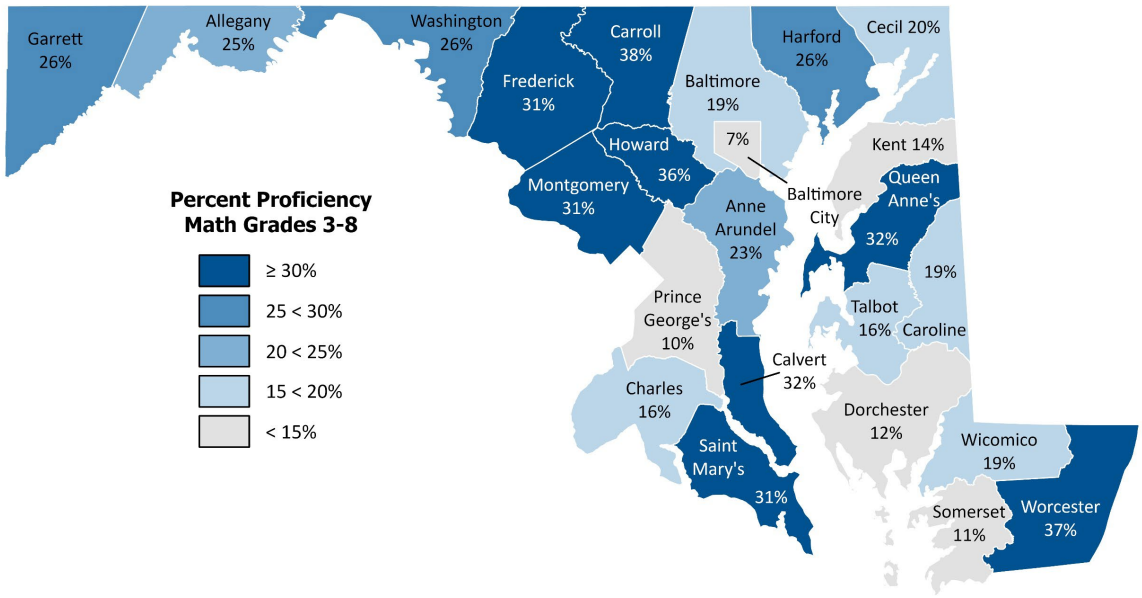
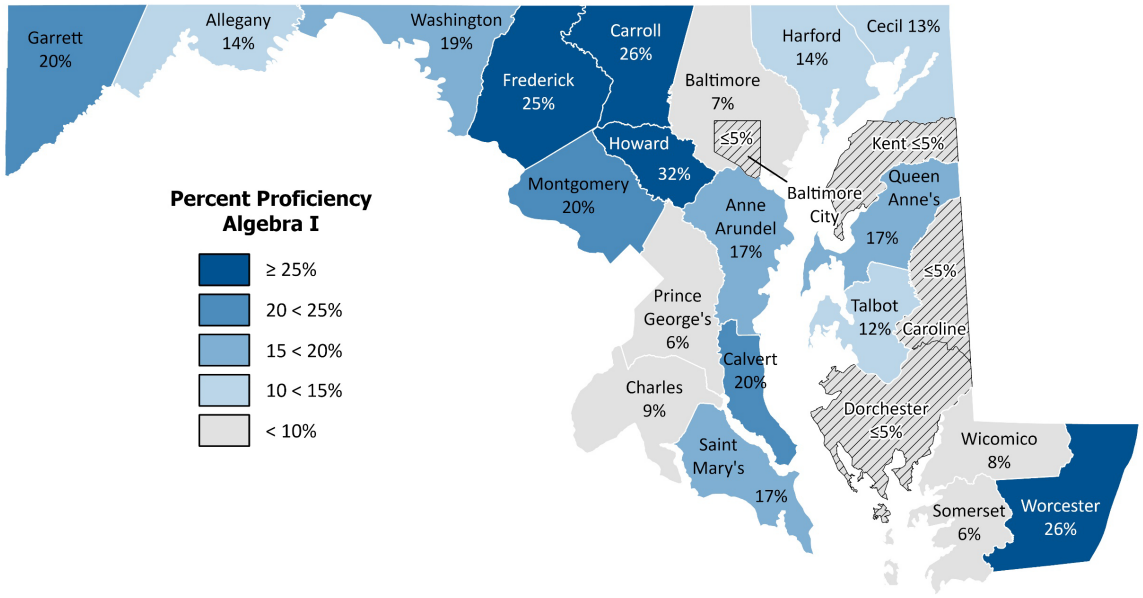


Chart 8: Algebra I Proficiency Rates by Local Education Agency, 2022

Statewide, the percentage of students that scored proficient on the Algebra I test was 14% but, as Chart 8 shows, this number varied from less than 5% in Caroline, Dorchester, Baltimore City, and Kent County to 32% in Howard County.



STUDENTS ON THE CUSP OF PROFICIENCY

The percentage of students who score proficient on an assessment is the most common and easily understood measure of student performance at the student group, school, district, or state level. One limitation of this measure, however, is that it focuses on only one point in the score distribution and overlooks students who were very close to achieving the proficiency standard. Table I shows the percentages of students who were on the cusp of proficiency, defined as a score range of 740-749, or less than ten points below the threshold for proficiency. Students who scored in this range, on average, only needed to answer one to three additional questions correctly to reach proficiency. Depending on the subject and grade, between one in ten and one in twenty students were on the cusp of proficiency in 2022.

TABLE I: COUNT AND PERCENTAGES OF STUDENTS ON THE CUSP OF PROFICIENCY IN MATH, 2022

	Student Count	Percent
Grade 5	10,640	16.4%
Grade 8	4,422	10.7%
Algebra I	10,509	15.0%

Note: On the cusp is defined as achieving a scale score of 740 to 749, or less than ten points below the proficiency threshold.

COHORT ANALYSIS

The trends in student proficiency presented above compare the same grade levels of students over time, e.g. grade 3 in 2019 to grade 3 in 2022. While this comparison indicates how students within a grade performed relative to prior students at the same level, it does not track the same students over time. Following the progression of students over time is an important indicator of how a school, LEA, or state educates students over their educational careers and is particularly important now, given that different grade levels were affected differently by the COVID-19 pandemic.[1]

Student progression over time can be tracked by following the same cohort(s) of students which excludes students who may enter or exit the district or state in future years. Table II shows the changes in proficiency rates of three cohorts of students, identified by their expected year of high school graduation, starting in grade 3. All three cohorts were in late elementary or early middle school when the pandemic began and each saw their proficiency rates more than cut in half, from approximately 44% in grade 3 – before the pandemic - to less than 20% in 2022. For comparison purposes, a similar analysis of 21 states found proficiency rates declined for the class of 2026 cohort in all 21 states, with decreases as high as 28 percentage points.[5]

TABLE II: COHORT MATH PROFICIENCY RATES BY EXPECTED HIGH SCHOOL GRADUATION YEAR

Cohort	Math 3	Math 4	Math 5	Math 6	Math 7	Grade 8	Change
Class of 2026 (n = 52,506)	44.7%	40.9%	39.0%	--	8.7%	18.2%	-26.5%

Cohort	Math 3	Math 4	Math 5	Math 6	Math 7	Grade 8	Change
Class of 2027 (n = 52,564)	43.7%	41.3%	--	22.0%	18.1%	(2023)	-25.6%
Class of 2028 (n = 52,867)	43.8%	--	23.8%	19.5%	(2023)	(2024)	-24.3%

Note: To conceptualize growth, the column titled “Change” represents the difference between the grade 3 rate and the last year (2022) available. Each ‘class’ of students consists only of students who have a test in each of the years included. All math tests are included - some grade 8 students took Math 8 while others took Algebra I.

The above cohort analysis is one example of an examination of student growth over time, e.g. to what extent are schools and LEAs helping students who were not proficient become proficient and keeping students who

[5] APPENDIX FOOTNOTE 3

were already proficient on track. Besides the cohort analysis, more sophisticated growth measures can capture a more nuanced picture of student growth by using the full range of scale scores instead of simply the dichotomy of proficiency.

The Maryland School Report Card, as approved by the U.S. Department of Education in the state's Every Student Succeeds Act (ESSA) plan, includes the student growth percentile (SGP) measure to capture a school's contribution to student growth in math and English language arts. SGPs compare changes in students' test scores from one year to the next compared to students who had a similar baseline score. While SGPs are useful for differentiating between schools' contributions to student growth regardless of the overall trend, e.g. a decrease in student scores due to the COVID-19 pandemic, it has some limitations. For example, if all schools showed little growth, since SGPs are a relative measure, the schools with the most growth would receive the most points on their School Report Card, regardless of if the growth was low in an absolute sense.

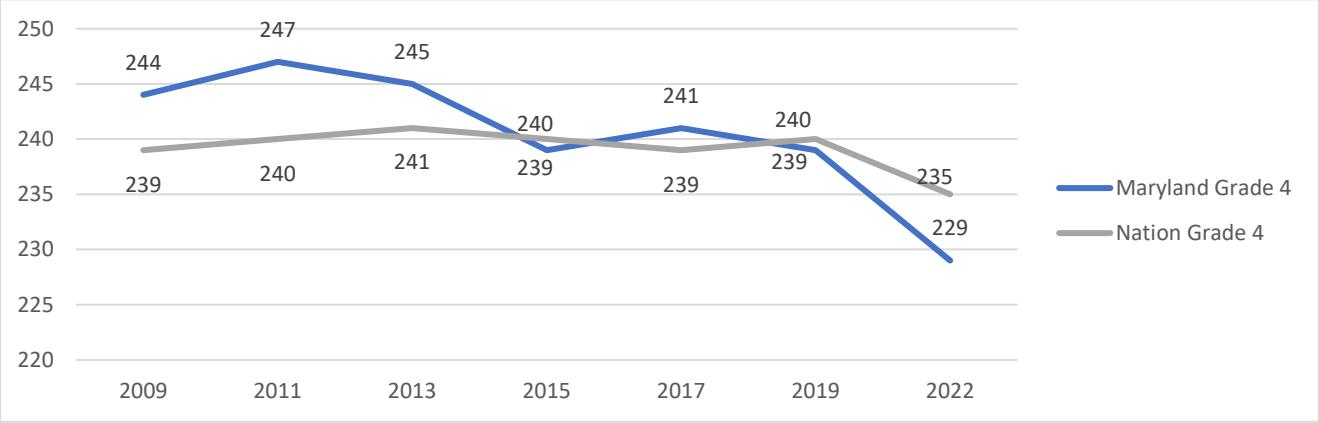
Due to the shortened version of the 2021 MCAP assessment, it was not possible to calculate student growth percentiles in 2022. When student assessment data from Spring 2023 becomes available, student growth from 2022 to 2023 will be calculated using student growth percentiles for inclusion in the Maryland School Report Card. MSDE is also exploring alternative measures of growth for future years that can be used to compare absolute levels of student growth across one year or multiple years.

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

The National Assessment of Educational Progress (NAEP) is a congressionally mandated project of the National Center for Education Statistics. Known as "The Nation's Report Card," NAEP is the only test administered nationwide that allows for direct comparisons of student achievement across states and participating districts. The assessment tests students in a nationally representative sample of schools in all 50 states, Washington D.C., the Department of Defense Education Activity, and select urban school districts. The test is administered in math and reading in grades 4 and 8 every two years and the 2022 NAEP was the first administration since the start of the COVID-19 pandemic.[6]

From 2009 to 2013, Maryland's grade 4 Math NAEP scores were above the national average. A sharp decline in 2015 put Maryland around the national average until 2019, the last NAEP administration before the pandemic. While the average grade 4 math score for the nation decreased by five points from 2019 to 2022, the average score for Maryland decreased by ten points between these two administrations (Chart 9).

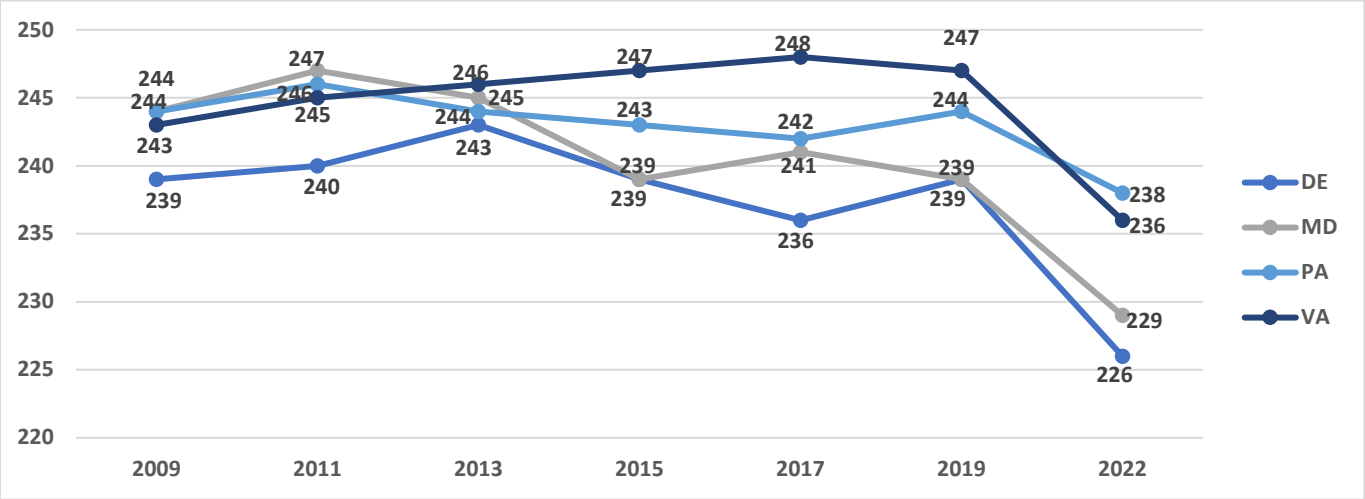
Chart 9: Average Maryland and National Grade 4 Math NAEP Scores



Consistent with the national trend, three of Maryland's neighboring states also saw large declines in math scores from 2019 to 2022 on the NAEP. In grade 4, Maryland saw a ten-point decline in average scale scores from 2019 to 2022, while Pennsylvania saw a six-point decline, Virginia saw an 11-point decline, and Delaware saw a 13-point decline (Chart 10).

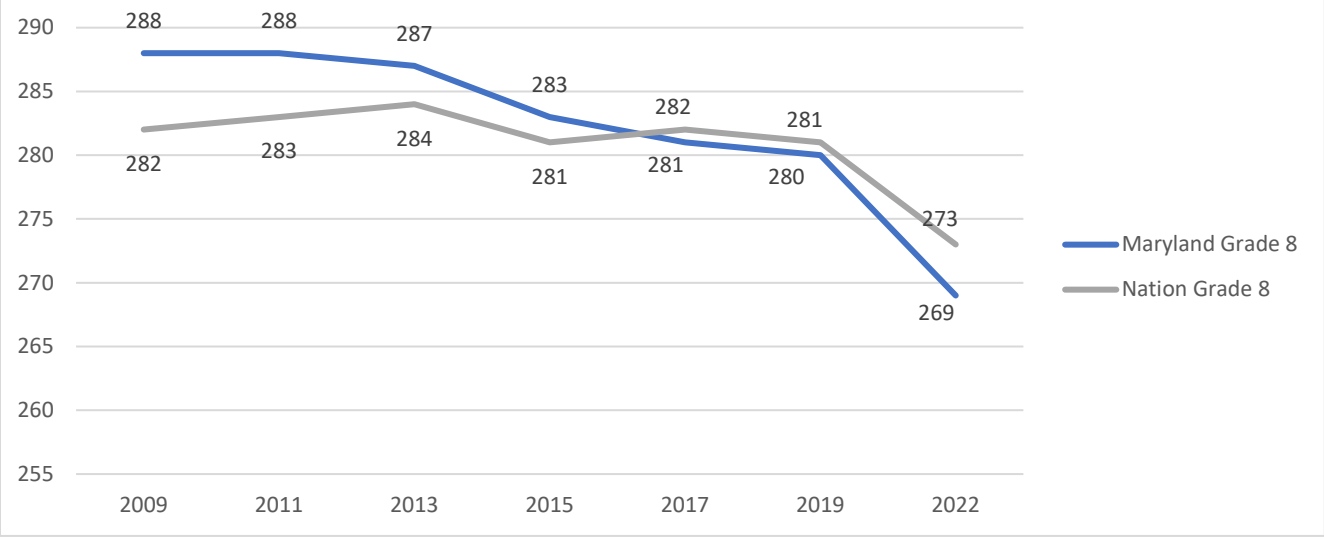
[6] APPENDIX FOOTNOTE 4

Chart 10: Average Maryland and Neighbor State Grade 4 Math NAEP Scores



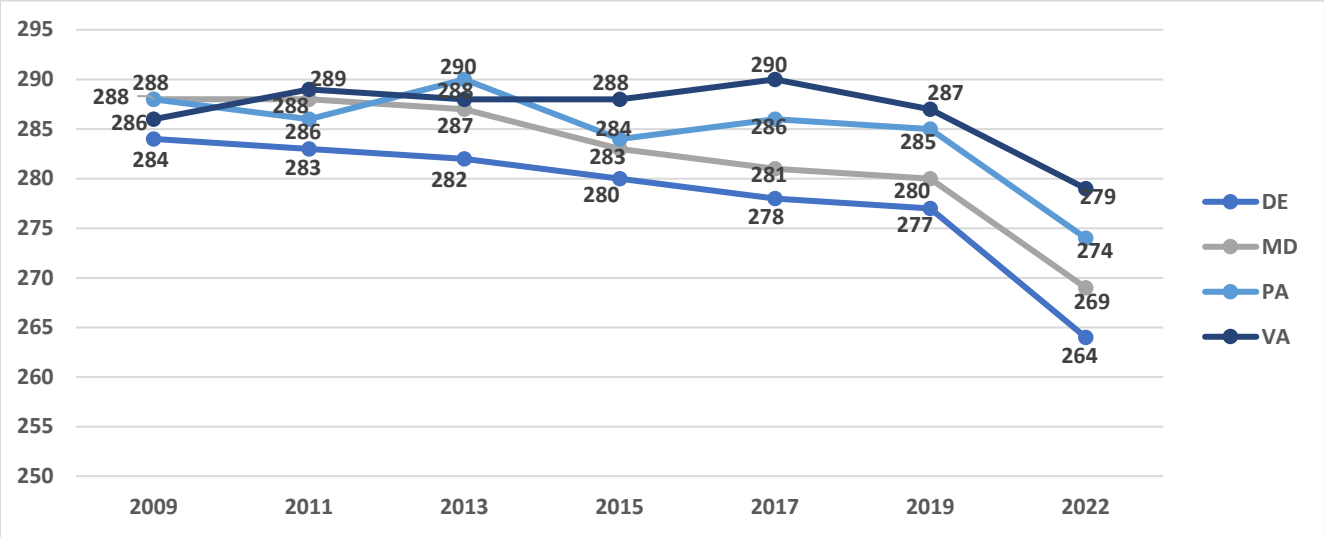
From 2009 to 2015, Maryland's grade 8 math NAEP scores were above the national average. Starting in 2013, however, Maryland's scores decreased each year while the national average stayed somewhat steady. The pandemic period further exacerbated this decline: while the average grade 8 math score for the nation decreased by 8 points from 2019 to 2022, the average score for Maryland decreased by eleven points over this same period (Chart 11).

Chart 11: Average Maryland and National Grade 8 Math NAEP Scores



Grade 8 math NAEP scores followed a similar pattern as grade 4 scores in 2022. While Maryland's average grade 8 math scores on NAEP decreased by 11 scale score points, Virginia decreased by 8 points, Pennsylvania decreased by 11 points, and Delaware decreased by 13 points (Chart 12).

Chart 12: Average Maryland and Neighbor State Grade 4 Math NAEP Scores



In addition to providing average performance for all students by state, NAEP also reports average scale scores for student groups, including race/ethnicity, English learners, students eligible for the National School Lunch Program, and students with disabilities. Across all student groups in grade 4, Maryland saw lower average scores in 2022 compared to 2019, although White students and students with disabilities did not see a statistically significant change in scores. All student groups except White students and students with disabilities also saw declines in comparison to their peers in other states. Hispanic students in Maryland dropped from 22nd in the nation in 2019 to 49th and English learners fell from 23rd to 45th.

Table III: Grade 4 NAEP Math Scores by Student Group and National Rank, 2019 and 2022

	Average Scale Score		National Rank†	
Student Group	2019	2022	2019	2022
All Students	239	229*	34	43
Black	224	213*	18	25
White	251	248	14	11
Hispanic	229	211*	22	49
English learners	218	201*	23	45
National School Lunch Program	224	210*	47	51
Students with Disabilities	210	207	33	34

*Difference between 2019 and 2022 scores is statistically significant ($p<0.05$).
†Maryland's mean score ranking relative to all other jurisdictions. The distribution of ranking due to a standard error on the scale scores is not considered.

In grade 8, all student groups in Maryland saw decreases in average math NAEP scores from 2019 to 2022 except English learners and students with disabilities, which both saw non-significant changes. In terms of national ranking by student group, there was less decline compared to grade 4. While all student groups in Maryland dropped relative to their peers across the nation, the decreases ranged from two places for students eligible for the National School Lunch Program to 7 places for English learners.

Table IV: Grade 8 NAEP Math Scores by Student Group and National Rank, 2019 and 2022

	Average Scale Score		National Rank†	
Student Group	2019	2022	2019	2022
All Students	280	269*	30	43
Black	261	250*	14	20
White	300	289*	5	11
Hispanic	261	250*	46	49
English learners	229	244	35	42
National School Lunch Program	260	250*	47	49
Students with Disabilities	246	244	19	24

*Difference between 2019 and 2022 scores is statistically significant ($p<0.05$).
†Maryland's mean score ranking relative to all other jurisdictions. The distribution of ranking due to standard error on the scale scores is not considered.

Blueprint Implementation and Math Instruction

In compliance with legislative requirements, the Maryland State Department of Education (MSDE) was tasked with the development of a Blueprint Implementation Plan template. The template, subject to review, modification, and approval by the Accountability and Implementation Board (AIB), was an opportunity for MSDE to significantly influence the direction and quality of comprehensive mathematics instruction across the state. MSDE seized this opportunity and devised a plan that, through carefully structured queries and prompts, necessitated local education agencies (LEAs) to critically examine and bolster their strategies, resources, and commitments to mathematics instruction. Upon review, the AIB affirmed the majority of MSDE's proposed language.

The Blueprint for Maryland's Future consists of five Pillars: Early Childhood Education, High-Quality and Diverse Teachers and Leaders, College and Career Readiness, More Resources to Ensure that All Students are Successful, and Governance and Accountability. Pillar 3 sets the expectation that all Maryland students have access to Prekindergarten through Grade 12 instruction that enables students to meet Maryland's College and Career Readiness standard by the end of tenth grade or by the time they graduate high school. The mathematics instruction components of the Blueprint Implementation Plans are reflected in Pillar 3 and the subsequent sections of this chapter provide a detailed overview of the key components of this initiative, their implications for mathematics instruction across the state, and the response of LEAs to this policy initiative. In March 2023, LEAs were required to submit plans with responses for all prompts for Prekindergarten through Grade 5 math instruction. LEAs will be required to submit updated plans inclusive of secondary math instructional plans through updated Blueprint plan submissions in March 2024.

COMPREHENSIVE PLAN FOR MATHEMATICS

Blueprint Implementation Plans required all LEAs to identify and communicate their mission, vision, and goals for mathematics as a component of their Comprehensive Plan for Mathematics. These plans are aligned with the Maryland College and Career Readiness standards and outline the LEA's instructional program for mathematics. To support their instructional program for mathematics, LEAs are also responsible for "providing ongoing, high-quality, job-embedded professional development for support staff and staff responsible for mathematics instruction and intervention" (Guidance Document with Criteria 3.1.3, 88-89). Tier 1 instruction is the uniform or core instruction that all students receive as educators follow the mathematics curriculum, which must be identified as highly qualified instructional material. Tier 2 instruction is targeted or intervention instruction for identified students based on a summative, formative, or diagnostic assessment, which usually occurs through small group instruction with a math teacher or support staff. Tier 3 instruction is an even more intensive intervention when students have not demonstrated growth with Tier 2 support, which usually occurs via small group pullout with a math interventionist or other designated educator.

As part of the Comprehensive Plan for Mathematics, LEAs must also provide a plan for identifying, providing, and exiting students from Tier 2 and Tier 3 instruction. The plan must include information on how the system will support school staff in the implementation of intervention programs and how assessments will be used to monitor and assess students' progress, how historically disadvantaged students will be prioritized, and how families may engage in this process (Guidance Document with Criteria 3.1.3, 99-105). LEAs provided data to outline the current achievement levels in mathematics for all designated groups by grade level and demographic. Using baseline data, LEAs were also required to include an initial projection for the 2023-2024 school year (Guidance Document with Criteria 3.1.3, 84). The development of the Comprehensive Plan for Mathematics is

meant to "ensure that students are ready for college-level credit-bearing coursework upon graduation and aligns to the Blueprint's intent" (Guidance Document with Criteria 3.1.3, 82-83).

Many LEAs are currently in the initial phase of development and have identified timelines for future development and implementation of their Comprehensive Plan for Mathematics. The LEAs with a timeline for the creation of the plan were approved based on their clear identification of personnel, responsibilities, and outcomes for the creation of a full plan. Somerset, Cecil, and Prince George's County all have a clearly defined vision, mission, and goals for mathematics aligned to their curriculum and an LEA strategic plan to develop an integral Comprehensive Plan for Mathematics by the start of the 2024-2025 school year.

Some LEAs have a more fully developed plan which includes the district's beliefs for teaching and learning mathematics, foundational mathematics content and skills, and professional learning plans for various audiences that are aligned with specific goals. For example, the Baltimore County Public Schools (BCPS) plan includes information about the district's teaching and learning framework, major coursework at each grade level, and effective mathematics teaching practices. BCPS also includes a plan for elementary professional learning with a focus on planning, instruction, student learning behaviors, and data literacy. Similarly, the Montgomery County Public Schools (MCPS) plan includes its vision as well as goals for elementary math instruction. The plan outlines professional learning needs and audiences specific to each goal. In addition, the Frederick County Public Schools (FCPS) plan includes detailed information about their process for identifying, providing, and exiting students in and out of Tier 2 and Tier 3 instruction. The FCPS plan identifies data and student characteristics that are utilized to place and exit students from mathematics intervention services as well as a flowchart that supports the school team in making decisions related to placement, duration, and environment for mathematics intervention for individual students.

HIGH-QUALITY INSTRUCTIONAL MATERIALS FOR MATHEMATICS

The Blueprint Implementation Plan also required LEAs to identify high-quality, content-rich, and culturally responsive instructional materials for all grade levels in math. LEAs must have an inclusive and rigorous process in place for selecting high-quality instructional materials. As an example of an inclusive process, Baltimore City's High-Quality Instructional Materials selection committees include educators, administrators, students, families, and community members. In addition to convening selection committees, LEAs use pilot programs, stakeholder feedback, and/or observations to see potential materials being implemented.

To determine if materials are high-quality and content-rich, LEAs start by reviewing the information found in EdReports, What Works Clearinghouse, and Evidence for ESSA to assess the quality and evidence base of instructional materials under consideration to determine if they should be included in the review process.[7] As an example, Wicomico County does not consider resources that do not have moderate or strong ratings from one of these sources and Frederick County's *Regulation 500-38 Textbook, Review, and Selection* includes specific language that requires Frederick County selection committees to review EdReports ratings as part of the selection process. LEAs are also required to explain how cultural responsiveness is assessed when reviewing instructional materials and plans for supplementing materials to ensure that they meet the cultural needs of students. The criteria used by Washington County Public Schools to assess cultural responsiveness include:

- Free from stereotypes, generalizations, misrepresentations, or negative portrayals of any group.
- Provides opportunities for students to share or learn about each other's differences.

[7] EdReports is an independent non-profit that provides web-based reviews of instructional materials based on their alignment to learning standards and degree of usability. The What Works Clearinghouse and Evidence for ESSA are repositories of research on curriculum.

- Presents opportunities to recognize and value differences between the home cultures of students and the culture of the classroom or school.
- Promotes diverse voices and perspectives of different groups.
- Provides relevant background knowledge when needed and/or opportunities to research aspects of a culture.

To ensure the implementation of instructional materials with fidelity, the LEAs must develop a detailed plan for providing ongoing professional development and instructional support with the implementation of the curriculum choice (Guidance Document with Criteria 3.1.3, 90-95). Worcester County Public Schools works to ensure that effective use of materials is accomplished through initial training by vendors with follow-up professional learning by coaches, lead teachers, and coordinators. The integrity of the programs is monitored through student achievement data and implementation integrity data (planning, main lesson, menu lesson).

LEA BLUEPRINT TRAINING AND PROFESSIONAL LEARNING

All LEAs are expected to develop systems for identifying and delivering initial and ongoing mathematics training that meets the needs of all educators. The plan must include how participants' mastery of content will be assessed, how the implementation of training will be monitored and assessed, and how data will be used to inform professional development (Guidance Document with Criteria 3.1.3, 85-87). All staff and support staff that deliver mathematics instruction and intervention will be provided with "ongoing, high-quality, job-embedded professional development" (Guidance Document with Criteria 3.1.3, 88-89).

LEAs have already begun to adapt data-driven platforms to fully capture the suite of professional development opportunities related to best practices in math instruction. An educator's needs and requests are gathered using surveys. These surveys are also used to monitor attendance and implementation goals. Ongoing face-to-face support from the elementary math resource team at the school level allows for alignment in school improvement plans and professional offerings for teachers. Teams at the school level allow for alignment in school improvement plans and professional offerings for teachers. This practice is evident in Howard County Public School Systems (HCPSS) in schools with high Free and Reduced meals (FARMs) where math coaches provide professional learning aligned to goals in the school improvement plan. Some LEAs also utilize Title II funds to pay for a teacher specialist dedicated to mathematics professional development and designate a Title I math teacher at each Title I-funded school. As an example, all Anne Arundel County Public Schools (AACPS) Title I schools are staffed with a Title I Math Teacher who supports teacher growth by providing ongoing job-embedded professional learning at the school level. These positions allow experienced and effective elementary math educators to work with teachers on the mathematics curricula planning and implementation using various models including small group teacher coaching and co-teaching.

TUTORING

Blueprint plans required that school systems provided a comprehensive plan for identification, provision, and moving into and out of Tier 2 and Tier 3 instruction in math for grades prekindergarten through 5, with meaningful details related to how the system will support teachers in their implementation of interventions including when and how high-quality, school day tutoring will be offered including through the Transitional Supplemental Instruction (TSI) targeted supplemental instruction program, as identified in the Blueprint. Tutoring must be supplementary instruction aligned to the adopted curriculum where there are no more than four students in a single session. Baltimore City has accomplished this by building personalized learning time into the day which is used to provide Tier 2 and Tier 3 support which includes opportunities for tutoring through various partnerships.

Some LEAs are using ESSER and other pandemic-related funds to provide high-dosage tutoring in all schools. LEAs are developing internal tutoring programs and partnering with vendors to provide in-person and virtual tutoring opportunities. By using both grant funds and local matching funds, other LEAs are utilizing retired teachers to tutor elementary students in mathematics during the spring semester of 2023. This is demonstrated in Worcester County Public Schools (WCPS) where braided funds are being used to hire retired teachers to tutor elementary students in mathematics.

Mathematics Professional Learning

The MSDE Office of Teaching and Learning Instructional Programs and Services provides leadership, technical assistance, guidance, and support for local education agencies (LEAs) through collaboration, innovation, and strategic systematic planning. Over the next two school years, MSDE will provide intensive professional learning opportunities to support math instruction through differentiated learning experiences for groups of educators to facilitate and support growth in math proficiency across the state.

EMPOWERING LEAS WITH DATA ACCESS AND ANALYSIS

A key aspect of the Maryland Comprehensive Assessment Program (MCAP) is putting actionable assessment data in the hands of parents, teachers, administrators, and LEA leaders to ensure that stakeholders use assessment results to improve student outcomes. MSDE provides an assessment reporting system for LEAs with defined user roles. The Reporting Administrator user role provides access to available reports, provides a mechanism to increase access to scores and reports faster, and is intended for teachers, coaches, school administrators, etc. MSDE is committed to ensuring that assessments matter and strives to continually improve and enhance the reporting of assessment results to families, educators, and the public. The table below provides information about key mathematic assessment reports available to LEAs.

Table V: MCAP Mathematics Reports

Report	Information	Use
Individual Student Report (ISR)	The report displays individual student performance on the overall test and on each reporting category (content, modeling, and reasoning). The student's performance is compared to the average for their school, the LEA, and the state.	Most LEAs distribute ISRs to families when scores are released. Parents can use the information to engage with teachers and inquire about the **specific knowledge and skills for which their students** may need additional support.
Reporting Category Summary	The report displays the percentage of students in each performance level (Beginning Learner, Developing Learner, Proficient Learner, and Distinguished Learner) and the average overall score by LEA or by the school. The report also presents information on the percentage of students in each performance level by reporting category (content, modeling, and reasoning).	LEA and school leaders can use this information to communicate internally and develop awareness about **overall performance** in mathematics in each grade/course and reporting category (content, modeling, and reasoning).

Report	Information	Use
Demographic Performance Level Summary	The report displays the percentage of students in each performance level (Beginning Learner, Developing Learner, Proficient Learner, and Distinguished Learner) by student group. Information is presented at the LEA level or at the school level.	LEA and school leaders can use this information to communicate internally and develop awareness about **performance gaps** in mathematics in each grade/course.
Evidence Statement Analysis (ESA)	The report displays student performance on each of the Maryland evidence statements at the state, LEA, and school levels. Information is displayed on a graph where evidence statements are ordered from the highest to the lowest level of difficulty.	LEAs review this report at the system and school levels. LEAs and school leaders can use this information to **support targeted interventions (i.e., tutoring) and focused professional learning.** This report is often shared with teachers to scaffold instruction for identified deficit skills from the prior grade level. **at the school level.**
School Content Roster	This is a school-level report that displays the performance of each student in each mathematics domain (grouping of evidence statements). Each student's performance is compared to the state average.	Principals can use this information for **targeted interventions to group students and differentiate learning** based on overlapping gaps in mathematics knowledge and skills.
Item Analysis Report	The report displays student performance on each test item. The results can be grouped by evidence statement, by domain, and by standard.	School-based grade-level teams can use this information to **identify standards that were overall strengths or challenges** for students and modify instructional practices accordingly. School leaders can use this report to identify domains and standards with probable instructional gaps to plan **targeted professional learning.**

MSDE will ensure LEA leaders can access and understand MCAP reports through report sharing and analysis at quarterly collaborative meetings with mathematics supervisors and as needed through LEA engagement. In the 2021-2022 school year, MSDE led sessions with LEA math leaders to provide an overview of the types of MCAP reports available, review the score report implementation guide, and discuss best practices for sharing data with stakeholders. These session materials were shared with math leaders so they could use them for professional learning with school administrators and teachers. Evaluation reports indicated that 76.5% of participants agreed or strongly agreed that these sessions enhanced their understanding of accessing, reviewing, and sharing MCAP reports. MSDE also recruits educators for various MCAP committees and activities to ensure that the items on the assessment are aligned with the standards and instruction, and measure student knowledge accurately and fairly. Educator participation in these committees supports MCAP development and provides high-quality, rigorous, and collaborative professional growth opportunities.

Moving forward, the MSDE Division of Assessment, Accountability, and Performance Reporting is designing a series of "Assessment Matters" resources that further detail the appropriate and effective use of each assessment report. Additionally, MSDE will expand available resources to include guidance for LEA leaders to support teachers and school-based leaders to analyze and action plan using MCAP data reports to inform school-wide structures and class instructional practices. MSDE will continue to collaborate with LEA math leaders to determine and respond to MCAP data analysis support and provide additional reports and professional learning opportunities when requested. For example, in the upcoming year, MSDE will provide

opportunities for math educators to experience norming on sample constructed response item writing and scoring in response to LEA requests.

MATHEMATICS LESSON STUDY

Following extensive research of lesson study models from Japan, Texas, and Education Northwest, the MSDE Math Content Team developed a lesson study protocol to provide an opportunity for school math teams to engage in authentic, teacher-led, job-embedded professional learning. This lesson study protocol is designed to:

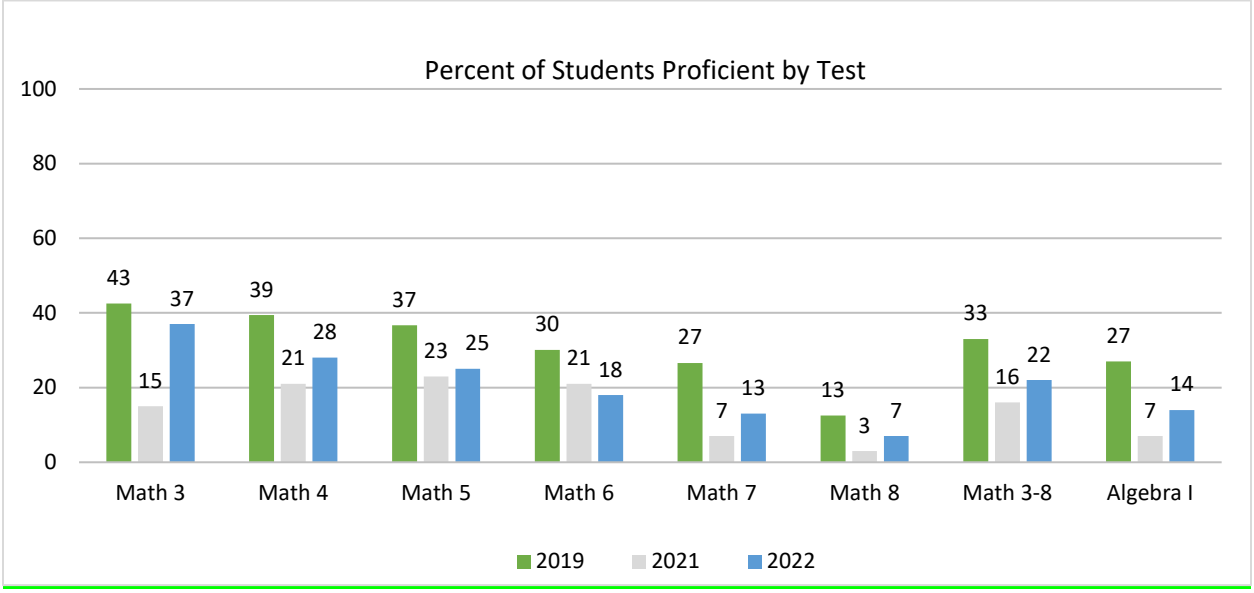
- Center student learning.
- Improve teacher effectiveness.
- Enhance teacher collaboration.
- Elevate data-driven and research-based instructional practices.
- Prioritize diversity, equity, and inclusion for all students.

At the start of the lesson study process, educators will identify a research theme, focus, and theory of action that will drive their work. Educators then collaborate to prepare and plan for a lesson with intentionally embedded instructional strategies that will address the research theme. Teaching, observing, debriefing, reflecting on, and refining the lesson allow educators to determine the effectiveness of the lesson's ability to address the research theme. Finally, educators will share their learning with stakeholders to support expanding the process to other schools across the state.

The MSDE Mathematics Lesson Study initiative seeks to improve teacher effectiveness by providing a structure that enhances the planning of mathematics lessons by using an inquiry cycle to collaboratively design, teach, and reflect on effective instructional practices. By engaging in the lesson study process, educators will build and refine ideas about "best practice" through careful, collaborative study of actual instruction. Through engaging in the lesson study stages, educators will build a habit of independent and collaborative reflection of effective instructional practices which transcends into planning meaningful lessons for everyday instruction.

In the 2023-2024 school year, the MSDE Mathematics Lesson Study will be piloted in two LEAs for middle school mathematics educators with the intention to scale the experience to more schools in subsequent years. The decision was made to focus on middle schools based on data from MCAP assessment trends as the image below demonstrates the downward trend in mathematics performance at the middle school level.

Chart 13: Math Performance by Test, 2019-2022



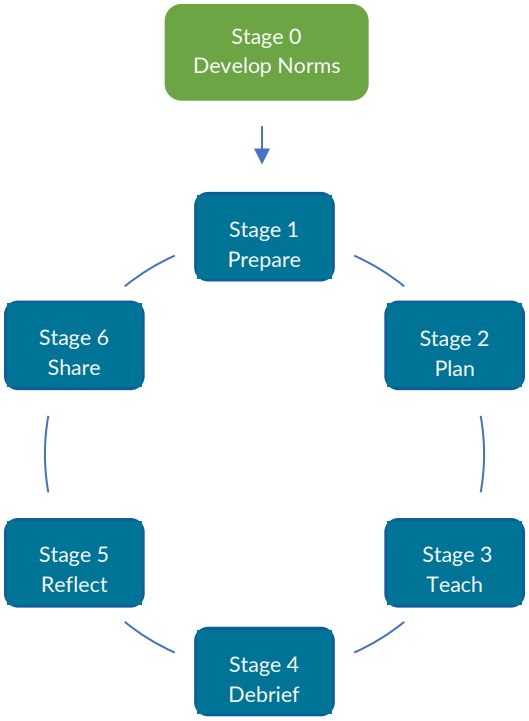
Note: The state math test was not administered in 2020 due to the COVID-19 pandemic.

The criteria below were used for the identification of pilot LEAs:

- Student proficiency levels for Math 6, Math 7, and Math 8 courses;
- Student growth for Math 6, Math 7, and Math 8 MCAP assessments from Fall 2021 – Spring 2022
- Retention rate of teachers; and
- The number of federally identified Comprehensive Support and Improvement (CSI) and Targeted Support and Improvement (TSI) schools

Based on the data, Kent County Public Schools (KCPS) and Prince George's County Public Schools (PGCPS) were chosen for the lesson study pilot following the cycle as shown in the image below.

Stages of the Lesson Study Cycle:



Lesson study norms will be finalized at the LEA level. The school will determine the research theme and focus of the mathematics lesson study in Stage 1 of the lesson study cycle. The determination will be based on a collaborative mathematics needs assessment at the school level. A detailed MSDE Lesson Study Protocol MSDE will be available for LEA leadership and school-based staff when schools are identified.

Identified schools and their leadership will be required to make a commitment to this initiative. Teacher teams will be required to participate in all lesson study meetings and observations and complete any necessary preparation prior to these meetings. The lesson study experience will build teachers' understanding of mathematics content and evidence-based practices and increase their capacity for effective implementation. It is expected that educators who participate in this experience will demonstrate evidence of growth in their mathematics content knowledge and their instructional practices. This will be monitored through a pre-and post-experience teacher efficacy survey, student work samples, and feedback from lesson study teams. Participants will be expected to share their learnings with other math educators in their LEAs and across the

state. The lesson study program will be scaled statewide in subsequent years with modifications based on the facilitator, participant, and student quantitative and qualitative feedback.

MATHEMATICS ELEMENTARY LEARNING LABS

In Spring 2023, the MSDE Office of Teaching and Learning Instructional Programs and Services hosted three early learning literacy labs in Calvert County, Wicomico County, and Baltimore City. These two-day learning experiences provided an opportunity for LEA leaders across the state to grapple with the essential question, "How do you leverage reading screening data to inform instruction?" through facilitated discussions, classroom observations in host LEAs, and interactive professional development sessions. Overall, participants included teachers, reading specialists, reading interventionists, school-based administrators, and district office leaders from 22 LEAs and Maryland School for the Blind. Participant feedback indicated that the learning lab experience was successful in meeting the learning objectives:

- Lead: Create the systems, structures, and processes to cultivate a school culture that prioritizes time and space for teachers to plan and implement effective instructional practices through data analysis, reflection, and collaboration.
- Coach: Provide job-embedded coaching and professional learning on how to use screening and intervention data to inform and adapt instruction.
- Teach: Plan and monitor learning to provide responsive instruction based on student needs.
  2022 Screening Data

Quantitative responses from the Spring 2023 learning lab evaluations are included below.

Table VI: Participant Responses from Spring 2023 Learning Labs

Prompt	Positive Response
How satisfied were you with the event overall?	100% satisfied or very satisfied
How likely are you to recommend the event to others?	99% likely or very likely
How likely are you to attend a similar event in the future?	96% likely or very likely

Examples of qualitative comments from the evaluation are listed below:

Table VII: Participant Feedback from Spring 2023 Learning Labs

Prompt	Sample Responses
Based on the ratings above, what about your experiences prompted specific ratings?	"Learning about how the interventions are used in different programs. Seeing the programs in action was great! Knowing that all districts have similar needs and concerns." "The opportunities to visit classrooms in action were highly meaningful. It was wonderful to see other school districts in action." "Observing research and practice in action with the school visit was very helpful. Also, the professional learning based around Tier 1 instruction, assessment, and intervention on day 2 was very informative and engaging."

	"Helpful to learn what other districts are doing and which barriers and challenges are shared and common! Loved learning more information about the varied strategies and solutions from other districts." "My ratings were based on thorough collaboration, time for reflection, and education behind the sessions." "The school visits and discussions about structured literacy and HQIM were helpful for us as we were able to connect with other districts and establish collaborative partnerships." "Very helpful to see what other districts are experiencing success and challenges with. It is clear that we need to revisit our Tier 1 and 2 instruction and assessment in order to make better-informed decisions about how to move forward." "I found all the material presented to blend well to create a comprehensive overview of our ELA domain. It created rich conversations within/outside our county." "EVERYTHING was valuable! What an awesome opportunity to visit MD schools and engage in dialogue about the district's success. We learned so much! The Day 2 presentation allowed for information, reflection, discussion, and action. That was awesome too."
Are there any additional comments you would like to share regarding any aspect of the event?	"Compliments to all who were instrumental in organizing this event. Thank you for providing transportation to the schools. The school that I visited was impressive and had a very welcoming staff. The students were engaged, focused, and being held accountable for their learning. It's always helpful to see programs in practice and to have an opportunity to as questions about how leadership created a working model." "More of these, please! I wish I could have brought more members from our office." "Please continue these in the future! It was wonderful." "This was such a fabulous opportunity. It would be nice to have more district debrief time after each segment of the day." "This was incredibly meaningful! Thank you so much for providing this opportunity!" "Wow. This event was impressive from start to finish in planning, execution, the quality of the content and presenters, and everything! Please hold more events like this, especially if they highlight districts/schools doing a good job. Thank you! Congratulations, BCPS!"

In Spring 2024, MSDE will conduct learning labs that highlight best practices in elementary mathematics instruction. These elementary math learning labs will be designed in a similar structure and are intended for math leaders and educators across the state. Participants will have the opportunity to enhance their understanding of the systematic vision and planning that has facilitated growth in student mathematics proficiency by engaging in professional learning, facilitated action planning, classroom visits, and collaboration with host LEA and school leadership.

From this experience, math educators will be encouraged and prepared to return to their LEA and recreate the systems, structures, and processes to cultivate a school culture that prioritizes time and structures for teachers to plan and implement effective instructional practices through data analysis, reflection, and collaboration as it

relates to elementary mathematics. To begin planning for potential LEA hosts, the MSDE Math Content Team visited 14 elementary schools across 6 LEAs in May 2023. School visits were conducted in collaboration with LEA math supervisors and school leadership. Schools were identified based on Spring 2021 MCAP math data in diverse schools that demonstrated student outcomes above statewide trends with student group gaps lower than statewide trends. Based on preliminary planning, elementary math learning labs will focus on developing and implementing instructional systems for procedural fluency and number sense, effective and efficient use of math coaches and interventionists, and intentional structures for professional learning communities focused on math data analysis and student work review.

DIFFERENTIATED PROFESSIONAL LEARNING EXPERIENCES

Modeling and Reasoning

All mathematics MCAP Assessments from Grade 3 through Geometry assess students' ability to reason with math through tasks that require students to provide arguments or justification, critique the reasoning of others, and use precision when explaining their thinking. MCAP also assesses students' ability to model with mathematics through tasks that require students to apply their understanding of math to solve real-world problems. Student ability to model and reason with mathematics is essential to supporting student mastery in math skills both procedurally and conceptually to prepare them for the college or career pathway of their choice. However, both quantitative analysis of assessment reports and qualitative discussions with math educators and students across the state demonstrate consistent challenges with comprehension and mastery of modeling and reasoning with mathematics. Aligned with this deficit, math educators across the state also demonstrate inconsistencies with instructional practices that help students to develop this skill. The table below demonstrates that across all math grade levels and courses, modeling, and reasoning-based items attribute to at least 20% of the most challenging items on MCAP.

Table VIII: Most Difficult Evidence Statement Analysis by Grade/Course for SY 2021-2022 MCAP Assessment

Course/ Assessment	Math 3	Math 4	Math 5	Math 6	Math 7	Math 8	Algebra 1	Algebra 2	Geometry
Percent of Top 5 Most Challenging Problem Types Attributed to Modeling & Reasoning	20 %	40%	20 %	20 %	20 %	60 %	40 %	40%	80%

To support growth in modeling and reasoning with mathematics, MSDE will offer a high-leverage professional learning series focused on enhancing instructional practices that improve student confidence and consistency with modeling and reasoning in the mathematics classroom. The professional learning series will provide opportunities for mathematics classroom teachers and school-based math coaches to:

- Deepen their understanding of the modeling cycle and MCAP Modeling Evidence Statements and articulate the importance of modeling in mathematics instruction.
- Identify, analyze, and create modeling tasks.
- Apply instructional practices/strategies that promote and create opportunities for modeling with mathematics.
- Plan for and implement instruction that focuses on modeling with mathematics in their classrooms.
- Deepen their understanding of mathematical reasoning and MCAP Reasoning Evidence Statements and articulate the importance of reasoning in mathematics instruction.
- Identify, analyze, and create reasoning tasks.

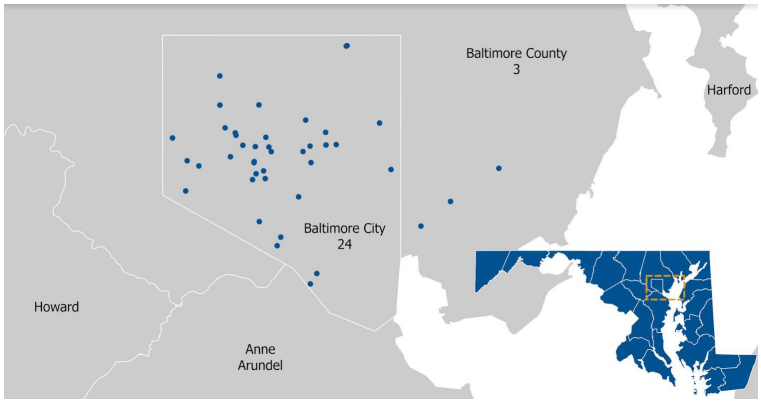
- Apply instructional practices/strategies that promote and create opportunities for mathematical reasoning.
- Plan for and implement instruction that focuses on modeling with mathematics in their classrooms.
- Deepen their understanding of MCAP Holistic Rubrics.

Table IX: Draft Session Outline

Session	Topic(s)
1	What is Modeling with Mathematics? • Discuss the difference between modeling with mathematics versus modeling the mathematics. • Introduce/review the Modeling Cycle. • Analyze the Maryland Modeling Evidence Statements.
2 – 3	Tasks that Support Modeling • Identify and analyze tasks that support modeling. • Adapt and/or create modeling tasks.
4 – 5	Instructional Practices/Strategies that Support Modeling • Explore evidence-based instructional practices that support modeling.
6	Implementation and Reflection • Implement instructional practices in the classroom and reflect on the experience.
7	What is Mathematical Reasoning? • Discuss mathematical reasoning and its components. • Analyze the Maryland Reasoning Evidence Statements.
8 – 9	Tasks that Support Reasoning • Identify and analyze tasks that support reasoning. • Adapt and/or create reasoning tasks.
10 – 11	Instructional Practices/Strategies that Support Reasoning • Explore evidence-based instructional practices that support reasoning.
12	Implementation and Reflection • Implement instructional practices in the classroom and reflect on the experience.
13 – 14	Applying Holistic Rubrics

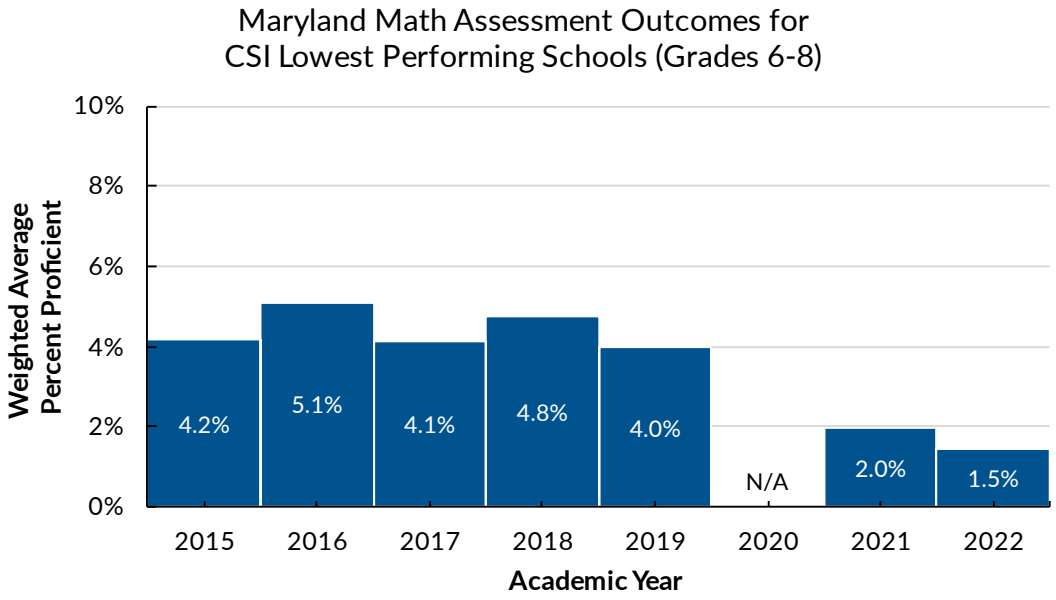
Participants will be required to attend and participate in all sessions, complete pre-work prior to sessions, and complete follow-up work including classroom implementation, gathering of artifacts, and reflection. It will be encouraged that multiple educators from each school participate in this professional learning series together to allow for collaboration and feedback during intersession work. This professional learning series will support teachers in increasing students' proficiency in both modeling and reasoning. This series will occur in a hybrid format (both virtual and in-person) with monthly sessions across the 2023-2024 school year and be open to all mathematics educators across the state, differentiated by grade band with a goal of at least 80 participants representing all LEAs. It is expected that educators who participate in this experience will demonstrate evidence of growth in their instructional mindsets and strategies related to modeling and reasoning with mathematics which will translate to an increase in student proficiency. This will be monitored through a pre- and post-experience teacher efficacy survey, student curriculum assessment data, and student MCAP data. Participants will be expected to share their learnings with other math educators in their respective LEAs and the series will be offered to a new group of educators in subsequent years with modifications based on facilitator, participant, and student quantitative and qualitative feedback.

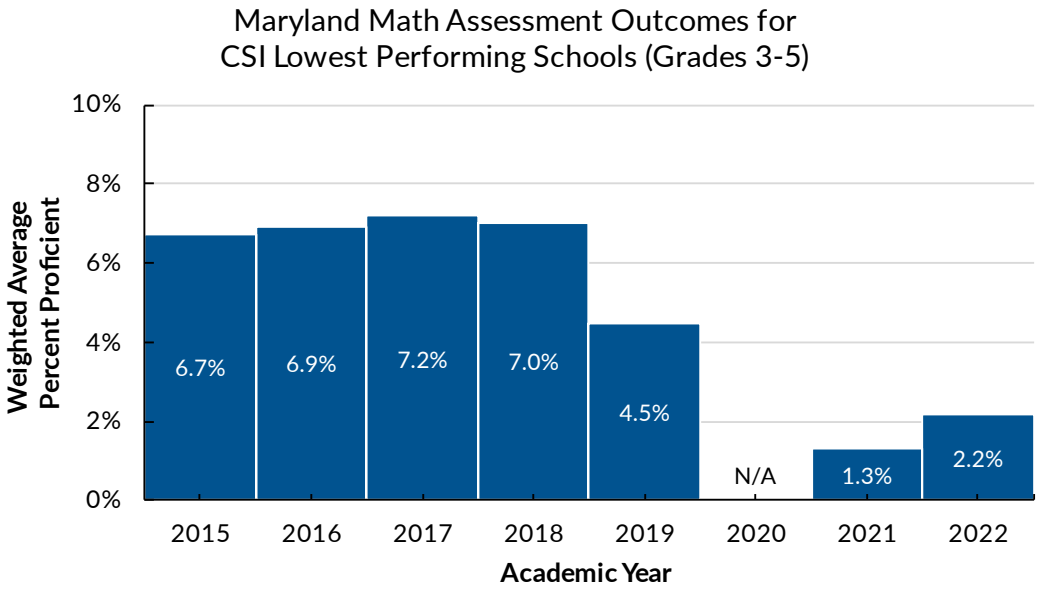
Mathematics Instructional Support for Comprehensive Support and Improvement (CSI) Low-Performing Schools



The MSDE Office of Teaching and Learning Instructional Programs and Services works collaboratively to support all federally identified Comprehensive Support and Improvement (CSI) and Targeted Support and Improvement (TSI) schools. The MSDE Math Content Team will further the targeted support of the CSI schools identified for low performance as the bottom 5% of Title I schools. As illustrated above, most of the schools are Baltimore City elementary and middle schools within a 10-mile radius of downtown Baltimore except for three that are Southeastern Baltimore County middle schools, which are also near Baltimore City. Some important demographic features of the identified schools are:

- 31 of the 32 schools have a student population greater than 50% of students designated as economically disadvantaged.
- 28 of the 32 schools are composed of greater than 80% Black students.
- Seven of the identified schools are composed of greater than 25% of students with disabilities.
- Two of the schools have greater than 25% of students designated as multilingual learners.
- Most of the identified schools have a population of 300-500 students.
- Fifteen of the Baltimore City schools are combined elementary-middle schools.





As indicated in the graph above, the identified low-performing schools have demonstrated challenges with student proficiency in mathematics over the last several years. Specific to Spring 2022 math MCAP data review, like statewide analysis, the Comprehensive Support and Improvement (CSI) low-performing schools demonstrate the most significant gaps in proficiency with modeling and reasoning evidence statements. These schools also demonstrate overall low proficiency levels across all content evidence statements with minor trends in any specific domains. However, there are some data points that go against declining trends and demonstrate some mathematics proficiency growth. For example, in 19 of the identified schools, growth in math proficiency from Fall 2021 to Spring 2022 outperformed ELA growth and in 5 of the 15 elementary-middle schools, the percentage of students proficient in mathematics at the middle school level was greater than

at the elementary level. Additionally, 18 of the schools had greater than 25% of students within 12 points of proficiency and 28 of the schools had greater than 10% of students within 12 points of proficiency.

The MSDE Math Content Team will continue to collaborate with LEA and school-based math leaders to understand the quantitative and qualitative student data for each school, and to differentiate support for leaders, educators, and students to ensure each school is prepared to improve mathematics outcomes for students. Comprehensive Support and Improvement (CSI) schools and district leaders will be required to identify math-specific goals and strategies as a component of their improvement plans. Additionally, school leaders and math instructional teams within CSI schools will be strongly encouraged to participate in one or more professional learning experiences to inform their mindsets and instructional practices. If it is determined that additional support is needed, this experience will be designed to meet the needs of the school. The goal for all low-performing CSI schools is to improve their math proficiency by meeting the goals as identified in their school improvement plans and federally set growth targets.

High-Leverage Instructional Strategy Professional Learning Series

The Standards for Mathematical Practice are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

MSDE adapted these standards from the Common Core State Standards for Mathematics. The standards describe the expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. Student proficiency with the behaviors described in these standards should increase with each additional year of mathematics instruction, which can only occur when math educators consistently facilitate learning using high-quality standards-based instructional materials using high-leverage instructional strategies with fidelity. High-leverage evidence-based instructional strategies include explicit, systematic instruction, use of visual and kinesthetic representations, developing mathematical literacy and metacognitive strategies, and providing opportunities for student discourse and critique of mathematical ideas.

The MSDE Math Content Team intends to design and implement a series of professional learning sessions that help educators reflect and improve on their use of these high-leverage instructional strategies within the classroom. These sessions will be offered to all school-based math educators in a hybrid setting that allows educators to learn or review each strategy, practice the strategy in their classroom, and then reflect independently and collaboratively. Educators will be charged to set and measure student outcome goals based on their shift in instructional practices. This ongoing series will begin in Summer 2024 and continue through the 2024-2025 school year.

MATHEMATICS LEA LEADERSHIP SUPPORT

Mathematics LEA Supervisor Support

MSDE hosts quarterly collaborative meetings for mathematics leaders from across the state. These collaboratives are intentionally designed for LEA mathematics leaders to develop professional relationships, deepen their understanding of MSDE expectations, including Blueprint planning and implementation, and share best practices for supporting Prekindergarten through Grade 12 mathematics instruction.

Over 60 mathematics leaders representing Maryland's 24 LEAs, the Maryland School for the Deaf, and the Juvenile Services Education Program attended collaborative meetings during the 2022-2023 school year. Collaborative session topics have included:

- Using the MCAP Mathematics practice assessments and reports to enhance instruction.
- Grade band breakout sessions for problem-solving challenging prerequisite skills in elementary, middle, and high school math courses.
- Reviewing assessment data to identify and plan next steps for the most challenging standards. Sharing strategies for addressing the impact of lost instructional time over the last few years.

- Reviewing the current mathematics credit, assessment, and enrollment graduation requirements, and the current metrics for determining a student's CCR status in mathematics.
- Discussing high school mathematics pathways course options currently being offered in the LEAs.
- Discussing mathematical language used in K-2 classrooms.
- Reflecting on the advantages and disadvantages of adding AP Precalculus to an LEA mathematics program.
- Reviewing the process for accessing reports and understanding the information provided on each report.
- Discussing how LEAs are developing reasoning and modeling instructional practices.
- Discussing how LEAs are meeting the needs of marginalized student groups.
- Reflecting on strategies being used to implement curriculums in meeting the needs of marginalized student groups.

Each collaborative session is concluded with an evaluation that is used to provide guidance as to what is working well and areas for continued support and growth. Quantitative responses from the March and May 2023 collaborative evaluations are included below:

Table X: Participant Responses from the 2023 Math Collaborative Meetings

Prompt	Positive Response
The March 2023 virtual mathematics collaborative provided an opportunity to purposefully collaborate with other Mathematics local educational agencies (LEA) leaders.	88 % (17 LEAs represented)
The March 2023 virtual mathematics collaborative provided an opportunity to enhance your understanding of accessing, reviewing, and sharing MCAP reports.	76% (17 LEAs represented)
The May 2023 in-person mathematics collaborative provided an opportunity to purposefully collaborate with other Mathematics local educational agencies (LEA) leaders.	100% (22 LEAs represented)
The May 2023 in-person mathematics collaborative provided an opportunity to receive useful updates of current topics of interest to Maryland's Mathematics community.	98% (22 LEAs represented)
The May 2023 in-person mathematics collaborative provided an opportunity to reflect on strategies to support teachers in developing student proficiency with applying all steps of the modeling cycle.	93% (22 LEAs represented)

Examples of qualitative comments from the evaluation of the March 2023 and May 2023 collaborative are listed below:

Table XI: Participant Feedback from the 2023 Math Collaborative Meetings

Prompt	March 2023 (Virtual) 17 LEAs represented in responses	May 2023 (In Person) 22 LEAs represented in responses
Share the most effective portions of today's collaborative.	"Feedback from other districts regarding strengths and weaknesses of other curriculums." "Interacting with other supervisors." "Break out rooms differentiated by topic." "Exploring some of the resources in Canvas and ideas through the discussion board post." "Having the chance to hear the ways that other districts have used the evidence statements reports and having a Q & A about the report." "I appreciate the use of the discussion board to capture info about math curriculum various districts use." "Walking through the MCAP reports in a smaller group was helpful." "(Review of) Evidence Statements and Modeling and Reasoning." "Enjoyed breakout rooms. Thanks for including slides for all."	"The 4 corners portion of our breakout room allowed us to hear, share, and network about a topic that we wanted to learn more about as it pertains to our work with modeling." "Breakout rooms were great, diving into modeling with math tasks." "The opportunity to speak with colleagues across the state." "All of it. Honestly" "Updates and clarifications on MCAP and related topics; discussion of modeling and its challenges." "I appreciated the structured opportunities for collaboration and discussions." "Modeling break-out sessions were excellent--collaborating and discussions are always good." "Collaborative conversation around how districts struggle to implement practices which focus on modeling but also generate ideas to improve practices." "Elementary Breakout four corners meeting and hearing St. Mary's Public Schools modeling story."
Share ideas and/or questions to inform and/or improve future math collaboratives.	"I love the focus on collaboration and shifting towards professional learning. It might be helpful to have a weekly or twice-a-month email with updates so that more time can be dedicated to professional learning." "I would love to collaborate on creating PD that could be used across the state or create some sort of repository of people willing to travel to different districts to share expertise for PD experiences."	"It was great to chat with others, but overall, there were more questions than answers. I'd love the time to dig into resources with others." "Continue to incorporate information relating to Blueprint updates and Comar. I love for MSDE to incorporate anything that can build our own capacity as content leaders in content and professional development delivery." "More on reasoning and modeling strategies. Examples not found on released items."

	"Continue to ask for feedback for topics for future meetings. Some time is needed with testing to discuss scores and reporting. Not just accessing reports, but now that it's adaptive, what those scores will mean." "Continue to have districts share with one another." "It would be great to be able to message people individually. I miss networking." "(I) like the breakout room spaces; could a representative from each group report out highlights from the discussion in that room."	"I prefer the face-to-face collaboratives since I feel there is more discussion and more opportunity to meet new people. When we did the four corners, the majority of the room went to corner 1. How can we move teachers to corners 2-4." "Would like more details on MCAP. And would like teacher-facing materials for PL on MCAP." "Some time to explore Pearson Access, pull data, and collaborate with other districts on analyzing the data. Discuss how everyone uses the data to make decisions within their LEA." "We should avoid counties sitting together- they always stay to collaborate with each other and not others as much. I wish we had more training resources. Some counties are struggling with more than one subject area and need more resources they can use in PDs. More hands-on activities. More hands-on math."

This quarterly collaborative structure will continue into the 2023-2024 school year with additional sessions to support math leaders who are new in their role and with a continued focus on building educator capacity with modeling and reasoning and an additional focus on data analysis, math fluency, and supporting building administrators with prioritizing math. Outside of the collaborative meeting structure, MSDE supports math LEA leaders through optional monthly check-in calls and ongoing discussions and resource sharing using the e-Community platform.

Mathematics School Administrator Support

Student proficiency in mathematics is explicitly linked to educators' instructional skills and belief in student capabilities. This educator skill and belief should be modeled by the school leader who must prioritize mathematics and be able to identify best practices and areas of growth as it relates to math instruction. Overall, many school leaders at every level from Prekindergarten through Grade 12 do not have a mathematics pedagogical background and are not always able to identify or support growth in their teachers which prevents math teachers and students from reaching their full potential. To overcome this challenge, the MSDE Math Content Team intends to design and facilitate "Leading for Mathematics" sessions across the state of Maryland in the fall of 2023. The intended outcomes of these sessions will be to provide a professional learning experience that supports school administrators to lead school teams that:

- Supports data-based decision-making in alignment with school progress plan goals using standards-based assessments and progress monitoring tools.
- Reimagines the use of time, talent, and resources for math intervention.
- Reinforces effective instructional practices for Tier 1, Tier 2, and Tier 3 math instruction, including the process and structures for student identification and exiting from intervention.

- Facilitates the collaboration of math educators and school administration to deepen understanding of Maryland Mathematics College and Career Readiness (MCCR) standards and Standards for Mathematical Practice.
- Shifts schoolwide culture to be inclusive and supportive of growth in mathematics.
- Provides opportunities for ongoing collaboration for educators across schools, LEAs, and statewide.

The sessions will include facilitated professional development sessions on high-leverage math instructional practices, math assessment analysis and progress monitoring, and classroom visits focusing on positive math culture. The sessions will conclude with reflections and action planning for short- and long-term shifts in school-based practices in alignment with the learning experience. School administrators will have the opportunity to identify and schedule follow-up check-ins with an accountability partner in another LEA. They will also have the option to opt into a year-long cohort that continues the professional learning with administrators across the state as an ongoing initiative to help them fully revamp their school culture with a focus on mathematics achievement, both inside math classrooms, and beyond. This learning series will include school and statewide assessment data analysis, strategies to improve educator and family mathematical mindsets, and strategies for cross-curricular incorporation of mathematics with a primary focus question, "What does it take to really meet the math goal set forth in my school improvement plan?" This cohort will serve as a model for other school leaders and at the conclusion of the 2024-2025 school year experience, the administrators will be prepared to mentor other administrators to shift their culture to uplift and enhance math instruction.

EXPANSION OF MATHEMATICS RESOURCES

To support consistency and equity in mathematics instruction and pedagogy statewide, the Math Content Team intends to design and share evidence-based resources that are accessible and meaningful for all math educators to enhance instruction. These resources will include publications and videos from national and local experts and expert organizations. They will be organized by grade level, by standard, and by strategy aligned to the Standards for Mathematical Practice and effective teaching practices for mathematics. Some of these resources will be collected by creating a digital resource catalog that is updated each year by leveraging skillful mathematics teachers across the state of Maryland. The intention of this resource expansion is to ensure that every math educator across the state can easily access resources to support their instruction for any mathematics lesson that they may need to teach. This is also in alignment with MSDE's commitment to providing instructional resources as outlined in the Blueprint.

Table XII: Draft Resource Expansion Timeline

Timeframe	Action
Winter 2022/ Spring 2023 (COMPLETE)	• *Review and analyze math websites across the country to identify trends in resources available for math educators.* • *Solicit feedback on resources that would be useful to math educators.*

Summer 2023	• Redesign website with additional resources and organized pages that include:
	  ○ Mathematics Resources for Educators
	  ○ Mathematics Resources for Parents
	  ○ Mathematics Resources for Students
	  ○ Professional Organizations

Fall/ Winter 2023	• Update the website with mathematics frameworks in alignment with CCR study outcomes. • Update the website to include upcoming math professional learning experiences.

Spring 2024	• Creation of MD Mathematics Digital Catalog Version 1.
Ongoing	• Updates with relevant math resources for all stakeholders, upcoming professional learning experiences.

STATE PERSONNEL DEVELOPMENT GRANT (SPDG): MARYLAND ACCELERATES

Maryland State Department of Education (MSDE), Division of Early Intervention and Special Education Services submitted a State Personnel Development Grant (SPDG) Proposal to the Office of Special Education Programs (OSEP), U.S. Department of Education, on March 9, 2021. The SPDG, H323A210010, was awarded on September 30, 2021, with a performance period extending to September 30, 2026. This is a five-year grant award with the budget period and award amounts as follows:

- Year 1 – 10/01/2021 – 09/30/2022 award $1,099,979.00
- Year 2 – 10/01/2022 – 09/30/2023 award $1,099,379.00
- Year 3 – 10/01/2023 – 09/30/2024 award $1,099,775.00
- Year 4 – 10/01/2024 – 09/30/2025 award $1,099,863.00
- Year 5 – 10/01/2025 – 09/30/2026 award $1,099,993.00

This five-year grant was intended to support Maryland's work to narrow the gap and improve mathematics proficiency and social-emotional competency for elementary students with disabilities. The focus of this work is to develop and implement a systemic approach to specially designed math instruction based on research, with embedded evidence-based social-emotional learning and support strategies. Participating districts and schools engaged in preparation activities during the second half of the 2022-2023 school year and will receive professional learning and coaching in the 2023-2024 year through 2025-2026.

LEA participants were identified through an application and interview process in which LEAs were required to submit narrative responses, attestations, an SPDG District Program Inventory, and district disaggregated student data in alignment with provided criteria. LEAs were selected based on their ability to demonstrate readiness to implement the new practices with success.

Baltimore County Public Schools (BCPS) and the Howard County Public School System (HCPSS) were selected for participation using the readiness criteria for LEA and school participation. Factors considered include:

- Use of an evidence-based mathematics screener/progress monitoring tool for assessing student performance with a system of disaggregated performance data.
- Implementation of an evidence-based elementary mathematics curriculum as a foundation of a multi-tiered system of support including intensive interventions and specially designed instruction (SDI).
- Commitment to adopting embedded social-emotional learning teaching practices to provide a foundation for students' learning.
- Implementation of SDI within the general education environment for all students with disabilities including individuals with significant cognitive disabilities.
- Communication of a shared responsibility for outcomes and deliverables.

Demographic Profile of Participating Schools

Baltimore County Public Schools

- Mars Estates Elementary School: Total student population 350 learners with 17% identified as receiving Special Education Services and 74% participating in Free and Reduced Meals. 58% of the student population identify as African American, 15% identify as White, 17% identify as Hispanic, 8% Multi-racial and 3% identify as Asian.
- Scotts Branch Elementary School: Total student population 520 learners with 10.9% identified as receiving Special Education Services and 71.5% participating in Free and Reduced Meals. 88.9% of the student population identify as African American, 2.35% identify as White, and 7.9% identify as Hispanic.

Howard County Public School System

- Hanover Hills Elementary School: Total student population 823 learners with 13.6% identified as receiving Special Education Services and 36.2% participating in Free and Reduced Meals. 41% of the student population identify as African American, 11.42% identify as White, 15.6% identify as Hispanic, 6.4% Multi-racial and 24.6% identify as Asian.
- Jeffers Hill Elementary School: Total student population 410 learners with 10.2% identified as receiving Special Education Services and 32.7% participating in Free and Reduced Meals. 42.4% of the student population identify as African American, 18.8% identify as White, 23.2% identify as Hispanic, 5.8% Multi-racial and 22.4% identify as Asian.

In the selected schools for BCPS, students with disabilities in grade levels 3-5 demonstrated a 2.3% proficiency rate on Spring 2022 Mathematics MCAP. In the selected schools for HCPSS, students with disabilities demonstrated a 10.3% proficiency rate on Spring 2022 Mathematics MCAP. Preliminary data suggests that the mathematics proficiency rate for students with disabilities across the participating schools in both LEAs is greatest in Grade 3 with a significant decline in Grades 4 and 5.

Year One implementation included the development of SPDG project management structures inclusive of establishing an Implementation Design Team, LEA Leadership Teams, and a SPDG Stakeholder Advisory Group. Quarterly meetings were held to build team capacity and initiate planning processes for engaging with national experts related to the creation of performance practice profiles for evidence-based core mathematics instruction aligned with the What Works Clearinghouse (WWC) Practice Guide,[8] individualized interventions intensive interventions using data for instructional decision making based on the National Center on Intensive Intervention[9], and the adaptation of content, method, or delivery of mathematics specially designed instruction (SDI) grounded in Self-regulated Strategy Development[10]. The SPDG Stakeholder Advisory Group is composed of state technical assistance partners, MSDE interagency collaborators across content emphasis, university representatives, and LEA leadership.

Thus far, the SPDG Advisory group has developed practice profiles for mathematics specially designed instruction, social-emotional learning, and partnering with families. Each practice profile will provide operational definitions for the components and practices that are based on research and required for effective

[8] APPENDIX FOOTNOTE 5

[9] APPENDIX FOOTNOTE 6

[10] APPENDIX FOOTNOTE 7

implementation. These components are listed in the table below. Teachers and math coaches in SPDG schools will utilize the practice profile to identify specific areas of growth for their practice.

Table XIII: SPDG Practice Profile Components

Mathematics Evidence-Based Practices	Family Components to Promote Mathematics Proficiency for Children with Disabilities	Social- Emotional Learning Supports

• Systematic and Explicit Instruction
• Mathematical Language
• Representations
• Number Lines
• Word Problems
• Fluency
	• Communication Channels
	  ○ Multiple means of dissemination
	  ○ Multiple means for input
	• Communication Quality
	  ○ Intentional
	  ○ Transparent
	• Mathematics Learning Partnership
	  ○ Trusting, positive, and culturally responsive
	  ○ Menu of home activities
		• Agency
		• Identity
		• Emotional Regulation
		• Social Skills and Relationships
		• Cognitive Regulation
		• Public Spirit

To ensure processes for full programmatic launch during the 2023 – 2024 school year, current actions include:

- Finalizing all Performance Practice Profiles.
- Development of the Fidelity of Implementation of Professional Learning Tool as required by OSEP.
- Development and pilot of the Instructional Coaching Cycle Tool and processes.
- Launching the SPDG Summer Academy professional learning institute for local district teachers, coaches, and personnel implementing the Performance Practice Profiles and Instructional Coaching Cycle.
- Finalizing the Memorandum of Understanding and Data Usage Agreements with the University of Maryland College Park.

The proposed timeline for ongoing implementation is outlined below:

Table XIV: Proposed State Personnel Development Grant Timeline

Year 1 **(2021-2022)*** **Extended into (2022-2023 due to COVID)**	Explore and Design • Define evidence-based practices for specially designed instruction for mathematics. • Define evidence-based practices for social-emotional learning. • Define evidence-based practices for professional learning and coaching. • Select and design measurements of fidelity and student outcomes.
Year 2 **(2022-2023)**	Install and Initial Implementation • MSDE collaborates with national experts and local math and SEL leaders to implement professional learning with identified schools. • July 2023: SPDG Educator Summer Training
Year 3 **(2023-2024)**	Implement and Revise • Pilot the coaching evidence-based practices. • Revise implementation and fidelity measures. • Implement professional learning and coaching to improve the implementation of math and SEL evidence-based practices with fidelity.
Year 4 **(2024-2025)**	Implement, Expand, and Refine • Scale up within the school. • Prepare to expand to other schools.
Year 5 **(2025-2026)**	Scale Up • Scale up to schools across the district and the state.

The Theory of Action Framework for SPDG

If MSDE creates a university-state-local partnership with support from national and state experts to collaboratively design:

- An evidence-based professional learning and coaching strategy that can be applied consistently at the university, state, and local educational systems;
- An evidence-based approach to math instruction aligned with the Maryland State Standards with adaptations to provide specially designed math instruction for learners with disabilities; and
- An evidence-based approach to providing social-emotional learning within math instruction; and IF these practices are applied in:
    - University courses for teaching general and special educators how to provide specially designed math instruction; and
    - Systems coaching by MSDE with local teams; and
    - Instructional coaching with local school educators;

THEN Maryland will have:

- Demonstration sites for:
    - Educating preservice and Inservice teachers in university programs;
    - A local professional learning and coaching model for increasing educator capacity in two districts; and
    - Providing evidence-based specially designed math instruction and social-emotional learning in four elementary schools across two districts; and
- Improved math achievement and social-emotional competency for all learners with disabilities.

Maryland Tutoring Corps: A Robust, Math-based, High-quality, School Day Tutoring Initiative

In June 2023, the Maryland State Department of Education (MSDE) announced a new math intervention program – the Maryland Tutoring Corps (MTC). The MTC grant program is a highly competitive MSDE grant opportunity that will leverage remaining one-time American Rescue Plan Elementary and Secondary School Relief Funds (ESSER III) to make a substantial investment in launching and scaling high-quality, school day tutoring programs for secondary math that will mitigate long-term learning loss resulting from the COVID-19 pandemic. The Maryland Tutoring Corps grant program will provide resources to seed permanent strategic partnerships with local education agencies (LEAs), groups of LEAs, institutions of higher education (IHEs), non-profit organizations, and/or county/city governments and will foster the development and implementation of high-quality, school day tutoring programs, particularly targeting students not demonstrating proficiency in math, including underserved student populations.

MSDE will award up to $10,000,000 in grants, which include a 2-1 match component designed to increase the program's investment from $10,000,000 to up to $30,000,000. To that end, grants will be awarded for work that prioritizes secondary students not proficient in math, particularly middle school students in grades 6-8, Algebra students of any grade level, and historically underserved students such as African American students, economically disadvantaged students, English learners, and students with disabilities.

PROGRAM REQUIREMENTS

Applicants must address and provide a description of how planned activities align with the goals of the Maryland Tutoring Corps grant program and the expected impact of the work on math proficiency for secondary students. To do so, applicants should include detailed baseline data and clear and feasible but ambitious success criteria associated with program goals that demonstrate tangible progress towards increasing math proficiency and closing the achievement gap for students in math. Applicants must also ensure all goals and measurable success criteria are disaggregated by all student subgroups, particularly historically underserved groups to ensure that proposed plans address existing and persistent disparities in math proficiency. Additionally, applicants must commit to supporting the development and implementation of systems to launch and scale high-quality, school day tutoring, including developing or modifying LEA policies, processes, and practices to support and sustain a tutoring corps in direct service of students. MSDE will partner with national leaders to provide selected applicants with technical assistance in program implementation. (Normal Style) Collaboration between the school system and community colleges shall result in the development and implementation of a program of study in the 11th and 12th grade for each student who has not demonstrated progress in meeting the CCR readiness standard by the end of 10th grade. Each program of study must consider:

MATH SCORES AND TUTORING INTERVENTIONS – PROGRAM THEORY OF CHANGE

Math scores across the nation have decreased significantly since the onset of the COVID-19 pandemic as evidenced by the 2022 administration of the National Assessment of Educational Progress (NAEP) and have not been this low since 1990. The same trend holds true for students in Maryland where students continue to fall behind in mathematics. A growing body of research supports that high-quality tutoring is one of the most effective educational practices that can enhance student learning, particularly in mathematics for older students. Research shows that tutoring provides personalized support for students that results in both accelerated achievement – anywhere from a few months to more than a year – and increased positive relationships with school.

A study by the National Bureau of Economic Research found that an initiative in Chicago Public Schools produced enormous math gains for students attending the Saga Education tutoring program. This program model includes a 2:1 student-to-tutor ratio with tutoring sessions scheduled at least three times per week for thirty minutes or more. Tutors are recent college graduates working with high school math students. The study revealed that students who participated in the program doubled their math growth in one year while those who continued the program grew even more the following year.

Tutoring as an academic intervention is not new, but it can be costly. As a result, in the past, access to tutoring has often been limited to families who could afford it, a circumstance that has left historically underrepresented students without access and falling behind academically, further exacerbating inequities in the education system. Recent research demonstrates that with the right systems and structures in place, high-quality, school day tutoring can be scaled and accessible to all students.

The Maryland Tutoring Corps grant program serves as a catalyst for LEAs, in partnership with institutions of higher education, to build systems and structures to support and scale high-quality, high-dosage school day tutoring for secondary (grades 6-12) students in mathematics, an investment that will significantly reduce the existing inequities in the education system, mitigate learning loss caused by the pandemic, and close achievement gaps for students.

Accountability and Measuring Success

All applicants to the Maryland Tutoring Corps grant program must include goals related to the number of tutors that will be hired and the number of students that will be served. Applicants are required to articulate clear goals and the related near-, mid-, and long-term outcomes that will drive the achievement of those grant program goals. For example: XX% of the LEA's students in grades 6-8 are not proficient in math. To provide high-quality, high-dosage school day tutoring to students, the LEA needs to hire Y tutors.

- The applicant could, for example, suggest that a project goal is to hire a cadre of tutors comprised of XX% college students, YY% retired educators, and ZZ% community members;
    - The applicant could describe near-term goals related to developing a marketing and communications plan to recruit tutors;
    - The applicant could articulate mid-term goals related to training and supporting tutors in math, pedagogy, and student mentoring;
    - The applicant could suggest long-term goals associated with the results of tutoring for specific student(s) and/or student group(s).

Since all applicants must include goals related to the number of tutors and students participating in high-quality, high-dosage school day tutoring, applicants are also required to identify and include the corresponding measure of success. Applicants must describe what success for this project would look like and what criteria will be used to determine success. LEA applicants must identify clear, data-driven metrics and provide baseline data and realistic expected success targets anchored in and tied to the evidence of impact already described above. For example, if cited evidence suggests a likelihood of achieving a given result (e.g., an increase in academic achievement in math) for certain activities and resources, the success criteria should use similar expectations.

MSDE will require grant recipients to complete quarterly reporting to ensure program implementation and launch remain on track. MSDE employs an active and engaged monitoring strategy that includes site visits, and implementation fidelity support to ensure a greater likelihood of program success. MSDE will use information from the program in conjunction with its Office of Research to assess program efficacy at the conclusion of SY 2024-2025.

Legislative Recommendations

In collaboration with the State Board of Education, the Maryland State Department of Education (MSDE) is fully committed to addressing extremely low math proficiency rates in Maryland. Proficiency data were trending down before the pandemic, as demonstrated in Section Two of this report. Calling direct attention to math proficiency in Maryland is essential – so too is the legislative support necessary that builds statutory pathways for MSDE to enact bold programs that can spur transformation and innovation. This section contains two promising programs from the 2023 legislative session the legislature can pursue to tackle math proficiency in Maryland schools.

MARYLAND PROMISE SCHOOLS

MSDE supported Senate Bill 814 of 2023, which would have established a new, statewide program, the Promise Schools program, to address persistently low-performing schools head-on. Currently, Maryland does not have a consequential process for formally turning around and transforming persistently low-performing schools and supporting the educators and support staff in those schools. Senate Bill 814 would require MSDE to establish a nationally benchmarked, evidence-based process to formally designate and subsequently transform persistently low-performing schools to accelerate student outcomes and support educator success.

Though the Promise Schools model would be new to Maryland – the approach itself is not new and evidence supports adoption. For example, the Education Policy Innovation Collaborative at Michigan State University just this fall found that students participating in Michigan's version of a school improvement model during the pandemic:

> *"…made similar and, in some cases, greater gains on their benchmark assessments than did students in demographically and academically similar districts across the state. This suggests that while the COVID-19 pandemic generated immense challenges for student learning, the many services and supports Partnership schools and districts offered may have mitigated some of the negative effects."*[11]

The evidence in Michigan follows data from other states, like Massachusetts. The Massachusetts Department of Elementary and Secondary Education in collaboration with the American Institutes for Research found in 2013 and again in 2016 that students in School Redesign Grant (SRG) schools (the Massachusetts iteration of this model):

> *"…performed better on the English language arts and mathematics sections of standardized state assessments than students in non-SRG schools."*[12][13]

Data from Massachusetts are particularly instructive given the influence of many Massachusetts policy ideas codified in the Blueprint for Maryland's Future. This bill creatively leverages existing formula mechanisms in the Blueprint to fund Promise School program efforts via the Concentration of Poverty grant phase-in provision of the bill. Moreover, the bill's stable annual appropriation ensures that, once a school begins performing well, the state does not pull the rug out from under the school by sunsetting the investments that are making the school successful.

[11] APPENDIX FOOTNOTE 8

[12] APPENDIX FOOTNOTE 9

[13] APPENDIX FOOTNOTE 10

Clear guardrails in the bill ensure that the law must be applied rigorously and require the Department to build, implement, and enforce a consistent process for administering the program – a task the Department takes seriously and one which MSDE stands ready to lead. This bill is anchored in and lays out all the necessary elements for a successful, research-based school transformation plan and framework to ensure Maryland is equipped to empower schools that need the most attention. See, for example, the Accelerating Campus Excellence framework, which:

> *"…ensures that not only are a district's more effective teachers working with the students with larger needs, but that the school is seen as a safe, warm, welcoming place, where children's social-emotional needs are met"*[14][15]

In addition, the bill's alignment with the Blueprint for Maryland's Future and the strengthening of community school implementation plans are critical components of the bill and will stand only to bolster program success.

Equally important in this bill is the consequence of not seeing results. This bill, if enacted, will not force a school's students to remain in a school that continues to underperform. Instead, in a school that does not meet improvement goals after three years, families are able to select a non-low-performing public school of their choice in their current LEA or another LEA in the state and be able to enroll (including transportation) in that school.

This program will ensure Maryland can close opportunity and achievement gaps for all of Maryland's children using effective, research-based strategies for school improvement. MSDE is eager for the opportunity to implement the provisions of this bill, if enacted, in partnership with LEAs while not compromising on the expectation of student and educator success for those in persistently underperforming schools.

MARYLAND NEIGHBORHOOD TIERS

Introduced in 2023, House Bill (HB) 1211 - Maryland Neighborhood Tier System Calculation - aimed to enhance the effectiveness of the state's educational system by addressing disparities in student poverty and teacher quality. This piece of legislation operationalizes the recommendations of MSDE, focusing on two pivotal concerns: accurately identifying and quantifying student poverty, and ensuring that high-quality teachers are serving in schools with the highest needs.

This bill augments the provisions of the Blueprint for Maryland's Future, which acknowledges the inadequacy of current poverty measures and the necessity of collecting new measures – namely, neighborhood indicators of poverty. These indicators are intended to give a more precise picture of student need, capturing the number of students living in poverty, the level of concentrated poverty, and the depths of individual students' poverty. By addressing these factors, the bill moves towards a more adequate state aid package, ensuring funding aligns more accurately with student needs.

In response to the directive of the Maryland General Assembly, the MSDE has developed this system incorporating neighborhood poverty indicators to determine school eligibility for compensatory education programs and concentration of poverty grants. In codifying the use of these indicators, HB 1211 took an important step toward fulfilling the state's educational mandates.

[14] APPENDIX FOOTNOTE 11

[15] APPENDIX FOOTNOTE 12

The Teacher Designation System

The Department's final report on Neighborhood Indicators of Poverty, which contained the model bill for HB 1211, also addressed the distribution of high-quality teachers, particularly in urban and rural schools with high poverty concentrations with the establishment of the Teacher Designation System. Recognizing the correlation between teacher quality, student achievement, and poverty, the legislation establishes a three-tier Teacher Designation System to identify, recruit, retain, and compensate exceptional educators. This district-defined, collectively bargained system aims to ensure that accomplished educators are deployed in Maryland's schools most in need.

The Compensatory Education and Concentration of Poverty resources allocated through the Blueprint formula using MNT methodology are only part of a larger, comprehensive strategy necessary to increase educational attainment for students attending schools that enroll high proportions of students living in concentrated poverty. Children in these settings also require access to the highest-quality educator workforce. The Teacher Designation System component of the Maryland Neighborhood Tiers and Teacher Designation Allotment Act accomplishes this goal.

The three-tiered system in the proposed bill allows for LEAs to create criteria for a graduated teacher identification system in conjunction with their local bargaining units that move beyond National Board Certification and tie to comprehensive and varied student and teacher metrics. These tiers will identify the highest-quality teachers in Maryland and provide salary incentive bands for each of the three tiers (recognized, exemplary, and master teachers) an LEA adopts and for which MSDE approves.

Systems like those in the proposed Teacher Designation System have long documented driving success. Evaluations of the federal Teacher Incentive Fund, for example, provide the clearest evidence to date that these systems:

1. Impact teacher distribution – the labor market responds to the incentives. Data indicate that teachers move to schools where incentives are available. Data also indicate increased retention and reduced turnover for these teachers in high-needs schools;[16] and
2. Impact student achievement – individual and meta-analysis indicate that the policies crafted in the Maryland Neighborhood Tiers and Teacher Designation Allotment Act improve student reading and student math scores, particularly in elementary schools.[17][18]

Existing precedence in Texas and Ohio (the "Ohio Teacher Incentive Fund") further supports the likely success of the proposed Teacher Designation System. Results suggest that strong incentives can carry impacts in areas of highest concentrated poverty. In Texas cities, for example, "teachers who live and teach in the cities are subject to higher costs of living and thus more likely to respond to an initiative that promises significant salary increases." Indeed, these policies have also driven broader improvement in educator quality. For example, Taylor (2021) found that the Texas model "can help to improve instructional effectiveness" via the establishment of the designation process.[19]

Taken together, the salary incentives embedded in this legislation coupled with Blueprint formula Compensatory Education and Concentration of Poverty resource distribution aligned more closely to student need ensure that

[16] APPENDIX FOOTNOTE 13

[17] APPENDIX FOOTNOTE 14

[18] See also: Pham, L. D., Nguyen, T. D., and Springer, M. G. (2020). Teacher Merit Pay: A Meta-Analysis. Am. Educ. Res. J. 58, 527–566. doi:10.3102/0002831220905580

[19] APPENDIX FOONOTE 15

students in circumstances of concentrated poverty have the resources and the teachers they need to be successful. A strong Maryland future requires strong Maryland teachers and well-resourced schools for students who need the most support. The Maryland Neighborhood Tiers and Teacher Designation Allotment Act is that pathway.

The logic or theory of change underpinning this legislation is twofold: firstly, by implementing a more nuanced, comprehensive measure of poverty, schools in the direst circumstances will receive the funds they need to improve student achievement. Secondly, incentivizing high-quality teachers to work in these schools will further enhance student performance. By addressing both the impact of concentrated poverty and the critical role of teachers, the bill aims to significantly improve student proficiency, including math proficiency, in Maryland's schools.

This legislation sets a clear path toward improvement and equity in Maryland's educational system. It addresses fundamental issues of poverty and teacher distribution, and in doing so, increases the chances of success for Maryland's most disadvantaged students. It may be a high-cost endeavor, but the act asserts the importance of adequacy in funding to deliver on the state's educational mandate. It is a bold move towards action, one that could push Maryland toward the finish line in the race to improve student outcomes.

THE MARYLAND EVERY STUDENT SUCCEEDS ACT ACCOUNTABILITY SYSTEM

In Maryland, and elsewhere in the nation, the dialogue on schools has become focused on ensuring that the learning trajectory for all students is aimed toward college and career readiness and postsecondary success. An accountability system provides a mechanism for ensuring that schools and LEAs are making progress and attaining state goals. Furthermore, an accountability system should ensure that achievement gaps between student groups are narrowed and highlight where students are not proficient, not making adequate progress toward proficiency, or not graduating on time.

The latest federal legislation about school accountability is the Every Student Succeeds Act (ESSA), signed into law in 2015. Under ESSA, each state is required to submit a state plan detailing how the law will be implemented, including how it will hold schools accountable for student performance. Some components of each state's accountability system are required by law—for example, all high schools, nationwide, are accountable for their graduation rate. ESSA does allow states to choose components of their accountability system that are important to its students and stakeholders. The State Board of Education, MSDE staff, LEA superintendents, principals, teachers, parents, community leaders, advocacy groups, and other stakeholders in Maryland worked together to create a Maryland Accountability System that measured relevant, actionable aspects of school performance. The Maryland ESSA state plan was approved by the U.S. Department of Education in early 2018, and the first Maryland School Report Cards were released late that year.

The Maryland Accountability System includes multiple ways to describe student and school performance. The major components of the Maryland Accountability System are called "indicators." The indicators are: Academic Achievement, Academic Progress, Progress in Achieving English Language Proficiency, and School Quality and Student Success at the Elementary and Middle School Levels; Academic Achievement, Graduation Rate, Progress in Achieving English Language Proficiency, Readiness for Postsecondary Success, and School Quality and Student Success at the High School Level. Each school's results on the Maryland Accountability System are compiled and reported on the Maryland Report Card website.

Mathematics Assessments in the Maryland Accountability System

The Maryland Accountability System includes state mathematics assessments in two indicators, Academic Achievement and Academic Progress. The Academic Achievement indicator represents student performance on state assessments in the most recent school year, while the Academic Progress indicator represents student growth in their performance on the current year state assessments as compared to the prior school year.

The Academic Achievement indicator is a component of the Maryland Accountability System for elementary, middle, and high schools. There are two measures in this indicator specific to mathematics: (1) percent of students scoring "proficient" or higher on state-standardized mathematics assessments; and (2) average Performance Level of students on state-standardized mathematics assessments. These two measures provide information about student mastery of the Maryland state mathematics standards.

The two mathematics measures in the Academic Achievement indicator provide information in two different, but equally important ways. First, the percentage of students who score at or above the "proficient" level on the test provides information on the students that have the expected knowledge, skills, and practices to demonstrate a command of grade-level academic standards. Identifying schools where many students are struggling to achieve proficiency on state assessments is a crucial step in targeting schools that would most benefit from support. The second measure is the average Performance Level of all students, regardless of whether they are proficient or not. This measure provides information about the entire range of student achievement in mathematics, rather than a single indication of whether students are proficient or not. Together, these two pieces of information describe not only whether a school's students are meeting expectations in mathematics, but also how all students are doing on average (even if the average is above or below the "proficient" level).

The Academic Progress indicator is a component of the Maryland Accountability System for elementary and middle schools and includes student growth on state-standardized mathematic tests. ESSA ushered in a new era of state education accountability and opened the door for an unprecedented number of states to include measures of student progress in accountability systems. Critically, ESSA moves away from a reliance on a one-time test score, or proficiency measure, as the primary measure of student success and school quality and requires states to include an additional measure of student achievement. Measures of student progress referred to as student growth provide a richer picture than test scores alone. Maryland utilizes the Student Growth Percentile (SGP) methodology which uses advanced statistics and students' past performance data to evaluate how students are performing compared to their academic peers across the state.

Growth as a Measure of School Quality

When considering the quality of a school, student growth is the preferred measure.[20] While a single year's proficiency rate provides an indication of the performance status of students, they do not account for schools' contributions to students' learning. Status measures of student achievement are highly correlated with student demographics, including poverty, English language proficiency, and disability status, and, since public schools cannot choose their students, reliance on these measures to indicate school quality results in low-poverty schools with higher ratings and high-poverty schools with lower ratings. In contrast, using student growth as a measure of school quality provides a fairer indicator that reflects how much students are learning at school, instead of student demographics or zip codes.[21]

[20] APPENDIX FOOTNOTE 16

[21] APPENDIX FOOTNOTE 17

In the current Maryland Accountability System, academic achievement in math accounts for 10% of an overall school's rating while growth in math accounts for 12.5% at both the elementary and middle school levels. At the high school level, academic achievement in math accounts for 15% but there is no growth measure, primarily because students are only required to be tested once in the high school grades. A school accountability system that relies more heavily on growth measures, particularly relative to status measures, would produce more valid school quality ratings that do not place schools serving high percentages of economically disadvantaged students at a disadvantage. School quality should be an indicator of the contribution a school makes to students' learning, regardless of their achievement level when they start the school year.

An internal analysis by MSDE found that schools' overall accountability scores were significantly associated with the percentages of students that qualified for Free and Reduced Price Meals (FARMS), were English learners, or were students with disabilities. In other words, much of school accountability scores under Maryland's Accountability System can be explained by student demographics, such as poverty, rather than the quality of the school in raising student achievement. Looking further at the individual measures that comprise the accountability system, the same analysis found that, compared to the percent proficient or average performance level in math (or ELA), Maryland's current growth measure, student growth percentiles, had a much weaker relationship with student demographics. However, the relationship between student growth and student demographics is still statistically significant, suggesting that further adjustments may be necessary to create a system that does not punish schools for serving higher proportions of disadvantaged students.

There are two general approaches that other states and districts have taken to create an accountability system that does not disadvantage schools for the students that they serve. First, statistical adjustments can be included in some student growth measures to account for differences in student populations across schools; and, second, instead of comparing all schools across the state to each other, regardless of student demographics, schools can be ranked along with other schools that are similar to each other in terms of student demographics. The advent of The Blueprint for Maryland's Future provides a unique opportunity to upgrade the Maryland Accountability System so that it fairly and accurately captures school quality through a foundation of student growth, a focus on closing opportunity and achievement gaps, and a goal that all students are on the path for college and career readiness.

Local Education Agency Accountability

The Maryland State Department of Education (MSDE) has built-in accountability and associated enforceability mechanisms in existing levers of state law to identify and remedy situations in which local education agencies (LEAs) are not meeting implementation targets and milestones. Those are the LEA funding withholding provisions of the Blueprint through the Accountability and Implementation Board; Expert Review Teams; and intensive LEA math.

MSDE will leverage all existing policy tools available as a state education agency to ensure and enforce program accountability. MSDE, as a state education agency, does not directly operate Maryland's twenty-four school districts, but MSDE will act wherever it is within the Department's power to do so.

BLUEPRINT IMPLEMENTATION PLAN PROGRESS AND AUTOMATIC WITHHOLDING

MSDE drafted and the Accountability and Implementation Board (AIB) approved Blueprint Implementation Plan requirements associated with the development and implementation of LEA comprehensive mathematics instruction plans. These plans are required to include progress monitoring, tiered intervention and support, and the curation and use of high-quality, content-rich, and culturally responsive instructional materials. Blueprint Milestones are embedded throughout the Blueprint Implementation Plan and require LEAs to set goals based on statutory deadlines and other intended outcomes. MSDE will use the Blueprint Milestones to review annual LEA progress and assess whether LEAs are on track to meet goals and whether MSDE should make recommendations (e.g., interventions, withholding funding, etc.) to the AIB.

EXPERT REVIEW TEAMS

MSDE has initiated a comprehensive school review process to facilitate the implementation of the Blueprint for Maryland's Future across schools and districts in the state. Integral to this effort is the Expert Review Team, a group of seasoned educators, leaders, and other specialists who are responsible for conducting school visits, and providing assessments of various areas such as curriculum, instruction, interventions, and behavioral health services aimed at improving student learning and well-being.[22] The team identifies effective practices and growth areas, then offers support to further school and LEA. This process was initiated as a pilot in 2022, allowing stakeholders to refine the school review process.

The Expert Review Team follows a meticulous process during their school visits. The team members observe classrooms, conduct interviews, and focus groups, and utilize additional data to assess how effectively the Blueprint for Maryland's Future initiatives are being implemented. Additionally, they collaborate with school-based faculty and LEA staff to develop recommendations, measures, and strategies to address the areas of growth identified during their reviews. The application process for the Expert Review Team remains open, encouraging education professionals to join in this pivotal endeavor.

The implementation of the Expert Review Teams serves as a critical accountability component of the Blueprint for Maryland's Future. These teams ensure that the LEAs are adhering to their approved implementation plans down to the school level, a vital step for the success of the Blueprint. Through their in-depth reviews, observations, and interviews, the Expert Review Teams can identify areas of strength and areas that require improvement, offering crucial feedback to the schools and LEAs. The use of these teams provides an additional layer of oversight and support, helping to ensure that all schools are fully implementing the Blueprint's initiatives

[22] APPENDIX FOOTNOTE 18

and are on a trajectory toward improving student outcomes. In this way, the Expert Review Teams contribute significantly to the goal of enhancing the quality of education for every student in Maryland. If the department, based on a recommendation of an expert review team, determines that a school's low performance on assessments is, in part largely, due to curricular problems, the school shall adopt the curriculum resources developed under this section (Maryland Ed. Article. 7–202.1. (E) (3)).

INTENSIVE LEA MATH PLAN

LEAs will be required to design and implement an intensive math plan for schools that do not demonstrate growth in mathematics proficiency over the next two years. These intensive plans will be differentiated by grade band and school need assessments. They will require LEA leadership to review their Blueprint Implementation Plans to evaluate the implementation of the use of talent, time, resources, and a combination thereof necessary for providing ongoing, high-quality, job-embedded professional development for staff responsible for mathematics instruction and intervention. The intensive math plan will require LEAs to enhance their Blueprint Implementation Plans with more rigorous prompts for each subcategory as outlined below.

Reimagine the use of:	In schools that have not demonstrated growth in student math proficiency by Spring 2025, LEAs will be required to:
Talent	• Hire and train at least one school-based math coach to support teachers in data analysis, planning, and implementing standards-based instruction. • Hire and train at least one school-based math interventionist to identify and support students for Tier 2 and Tier 3 instruction. • Require intensive evidence-based math instructional strategy professional development of teachers, coaches, and administration during school-based staff meetings. • Require math educators at identified schools to participate in MSDE math professional learning experiences aligned with targeted areas of growth.
Time	• Designate time in master schedule for professional learning communities with math educators, math coach, math interventionist, special educators, and multilanguage learner teachers. • Designate time in master schedule for math coach to observe and meet with teachers. • Designate time in the master schedule for identified students to engage in math intervention and/or high-quality, school day tutoring. • Designate time for ongoing LEA math leadership and school team collaboration and support.
Resources	• Ensure school teams have access to a data analysis tool that supports identifying, progress monitoring, and exiting Tier 2 and Tier 3 instruction. • Ensure school teams have a data analysis tool that allows access to baseline data and supports rigorous and meaningful goal setting for student groups and cohorts using curricular and standardized assessments. • Ensure school teams have access to and understanding of MCAP score reports. • Audit quality and fidelity of implementation of Tier 1, Tier 2, and Tier 3 curricular resources and assessments

Reimagine the use of:	In schools that have not demonstrated growth in student math proficiency by Spring 2025, LEAs will be required to:
Combination	• (Elementary) designate resources, staff training, and time for development of math fluency (fact and procedural). • (Middle) designate resources, staff training, and time for educators to implement "Just in Time" scaffolding with appropriate pre-requisite skill review for each new unit of study. • (High) designated resources, staff training, and time for support in College Career Readiness assessment preparation for students. • Designate resources, staff training, and time for support in uplifting a positive schoolwide math culture (e.g. mindsets, confidence, dispositions). • Implement an organizational partnership or resource to support families with understanding and encouraging student math goals and growth.

Appendix

DRAFT EXPERT REVIEW TEAM RUBRIC – MATH-RELATED AREAS

Measure: Mathematics Instruction Prekindergarten- Grade 12
Students receive mathematics instruction aligned with current research- based strategies.

Not Evident	Developing	Accomplishing	Accomplishing w/ Continuous Improvement
☐ **Few** (less than 25%) of classrooms observed implement evidence based mathematical instructional practices aligned to standards-based content, problem solving, and mathematical reasoning. Examples include but are not limited to instruction on: ▪ clear instructional outcomes and intentional positive mathematical mindset building (progress monitoring, perseverance, supporting productive struggle) ▪ use of mathematical representations (teacher modeling and student use of mathematical tools) ▪ scaffolding of content from fluency to conceptual understanding with application (grade level content, intentional and consistent check for understanding opportunities with feedback) ▪ an emphasis on student thinking (sharing developing thinking, justifying responses)	☐ **Some** (25%-59%) of classrooms observed implement evidence based mathematical instructional practices aligned to standards-based content, problem solving, and mathematical reasoning. Examples include but are not limited to instruction on: ▪ clear instructional outcomes and intentional positive mathematical mindset building (progress monitoring, perseverance, supporting productive struggle) ▪ use of mathematical representations (teacher modeling and student use of mathematical tools) ▪ scaffolding of content from fluency to conceptual understanding with application (grade level content, intentional and consistent check for understanding opportunities with feedback) ▪ an emphasis on student thinking (sharing developing thinking, justifying responses)	☐ **Majority** (60%-84%) of classrooms observed implement evidence based mathematical instructional practices aligned to standards-based content, problem solving, and mathematical reasoning. Examples include but are not limited to instruction on: ▪ clear instructional outcomes and intentional positive mathematical mindset building (progress monitoring, perseverance, supporting productive struggle) ▪ use of mathematical representations (teacher modeling and student use of mathematical tools) ▪ scaffolding of content from fluency to conceptual understanding with application (grade level content, intentional and consistent check for understanding opportunities with feedback) ▪ an emphasis on student thinking (sharing developing thinking, justifying responses)	☐ **At least 85%** of classrooms observed implement evidence based mathematical instructional practices aligned to standards-based content, problem solving, and mathematical reasoning. Examples include but are not limited to instruction on: ▪ clear instructional outcomes and intentional positive mathematical mindset building (progress monitoring, perseverance, supporting productive struggle) ▪ use of mathematical representations (teacher modeling and student use of mathematical tools) ▪ scaffolding of content from fluency to conceptual understanding with application (grade level content, intentional and consistent check for understanding opportunities with feedback) ▪ an emphasis on student thinking (sharing developing thinking, justifying responses)

Mathematics Instruction Students receive mathematics instruction using evidenced- based instructional strategies. • Evident • Not Evident	A. Mathematics goals are visible in student friendly language. B. Students can communicate short- and long-term learning goals. C. Students engage in content that is aligned to rigor of grade level or course standard. D. Students encouraged and supported to demonstrate positive mindsets and language around solving mathematics problems. E. Students use multiple representations including but not limited to manipulatives, drawings, number lines, and equations. F. Students demonstrate procedural fluency, conceptual understanding, and the ability apply their understanding to solve real world problems. G. Students are presented and practice multiple strategies to solve problems. H. Students engage in purposeful questions and discourse with appropriate mathematical language. I. Students receive feedback throughout lesson.

REPORT FOOTNOTE ONE:

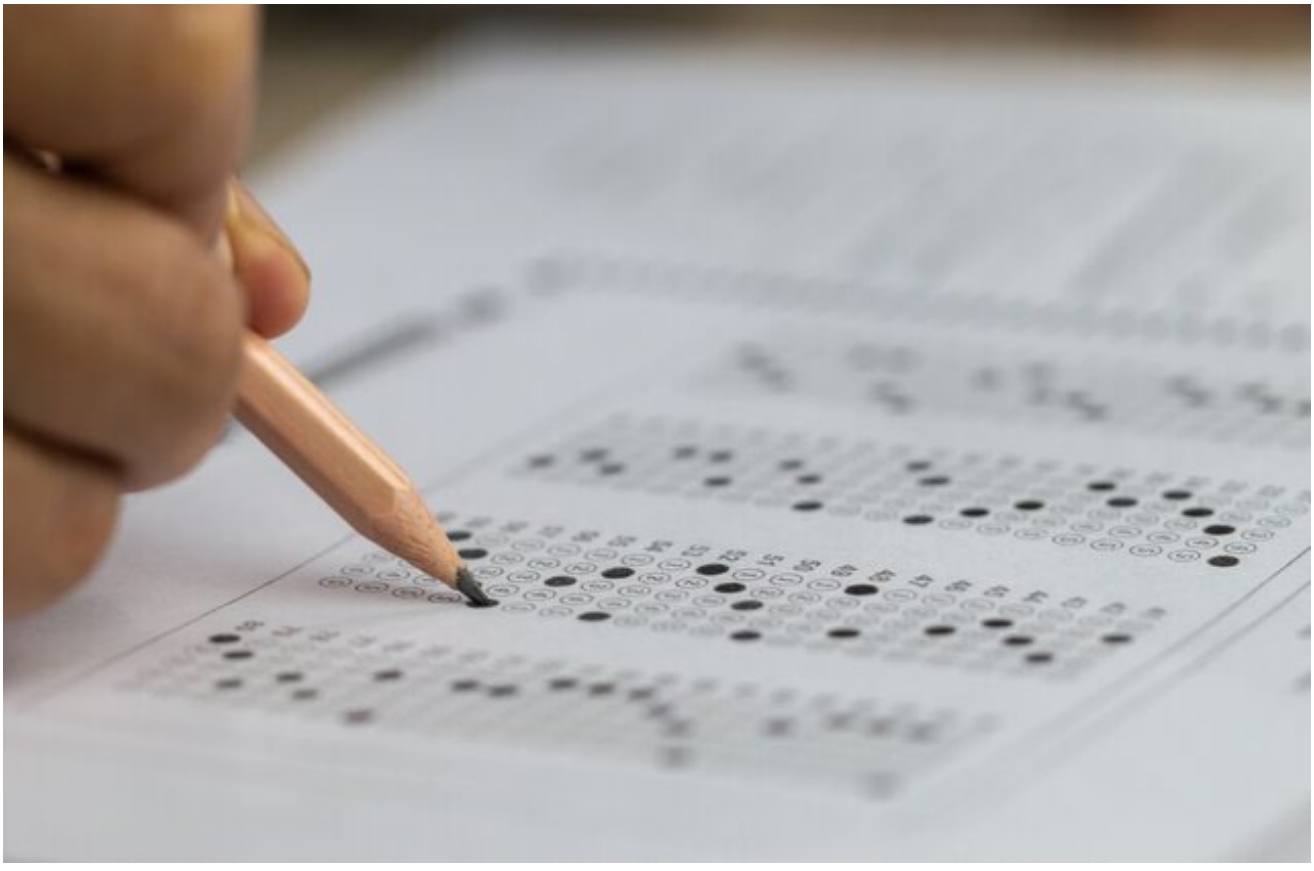
Citation: https://www.usnews.com/news/best-states/articles/2022-10-26/states-with-the-largest-drops-in-reading-math-test-scores#:~:text=Across%20the%20U.S.%2C%20the%20average,level%20of%20academic%20achievement%20%E2%80%93%20grew. Accessed, June 21, 2023.

Mapping the Math of America's Test Score Declines

The Nation's Report Card offers a sobering look at how U.S. students have regressed in reading and math, and shows which states experienced the most sizable setbacks.

By Lauren Camera

Oct. 26, 2022, at 2:15 p.m.



Education Secretary Miguel Cardona called the results from the National Assessment of Educational Progress “appalling and unacceptable."**(GETTY STOCK IMAGES)**

When the Education Department released data earlier this week documenting what U.S. students in the fourth and eighth grades know and can do in math and reading – the most comprehensive examination of the coronavirus pandemic’s impact on K-12

learning to date – few batted an eye when their long-held assumptions about that impact were confirmed.

READ:

A Historic Decline in Student Progress

Nationally, students posted the largest score declines ever recorded in math in the assessment's history. In each subject, public school students in a majority of states experienced significant score drops between 2019 and 2022.

"The results show the profound toll on student learning during the pandemic, as the size and scope of the declines are the largest ever in mathematics," said Peggy Carr, commissioner of the National Center for Education Statistics, the research arm of the Education Department, which released the data on Monday.

Scores from the National Assessment of Educational Progress, also known as NAEP or "The Nation's Report Card," encompass students in fourth and eighth grades in all 50 states, the District of Columbia, Department of Defense Education Activity schools, Bureau of Indian Education schools, Puerto Rico (in math) and 26 large urban school districts that volunteered to participate. The national results reflect a common measure of student achievement across public, private, Defense Department and Bureau of Indian Education schools.

Across the U.S., the average math score for fourth-graders fell 5 points since 2019, while the score for eighth-graders dropped 8 points. In reading, average scores for both grades fell 3 points.

In addition, the shares of students below the "basic" level – the lowest level of academic achievement – grew. In math, one-quarter of fourth-graders were below the basic level in 2022 and 38% of eighth-graders were below the NAEP basic level. In reading, the percentage of students below the NAEP basic increased by 3 percentage points in both grades.

Education Secretary Miguel Cardona called the results "appalling and unacceptable."

While few were surprised by the outcomes – in fact, they were widely expected given the significant academic setbacks documented over the last two years as a result of interrupted learning during the COVID-19 pandemic – the scale and scope of the declines is staggering.

Data broken down by state – reflecting the performance of public school students – shows that not a single state saw a statistically significant improvement in any grade-

subject combination. A state-by-state look also points to where student setbacks were most significant.

In Delaware, for example, fourth-grade math scores dropped a whopping 14 points – nearly three times the national average. The state posted some of the biggest drops in other grade-subject combinations as well, including a 12-point drop in eighth-grade math, a 9-point drop in fourth-grade reading and a 7-point drop in eighth-grade reading.

The Best Counties for Education

View All 29 Slides

Public school students in Oklahoma, Virginia and Maine also experienced some of the biggest grade-subject combination score drops.

Nearly half of all states posted declines of 9 or more points in eighth-grade math, one of the most important school years for students building foundational skills.

Notably, Carr cautioned against comparing the amount of time states and districts remained in remote learning and their math and reading scores, underscoring that remote learning looked different across the U.S., with various factors affecting the quality of virtual instruction.

"There's nothing in this data that says we can draw a straight line between the time stamp and remote learning in and of itself and student achievement," she said. "There's nothing in this data that tells us that there's a measurable difference in the performance of states and districts based solely on how long schools were closed."

Carissa Moffat Miller, CEO of the Council of Chief State School Officers, which represents K-12 state education chiefs, was quick to underscore that annual state assessments – as opposed to the NAEP exam – provide more frequent and better examinations of what students know.

"Though some 2022 state assessment results have shown promising signs of growth, the results also show that more is needed for students, particularly those most directly impacted by the pandemic and who are historically marginalized," she said. "State leaders and CCSSO are committed to doubling down on programs that have been proven to help students achieve, like high-dosage tutoring, evidence-based literacy instruction, high-quality instructional materials and supports for student well-being."

Here are the states that posted the biggest score declines among public school students:

4th-Grade Math Drops Between 2019 and 2022

(Fourth-grade mathematics scores declined in 43 states/jurisdictions)

- **Delaware:** -14
- **Virginia:** -11
- **Maryland:** -10
- **New Mexico:** -10
- **New York:** - 10

8th-Grade Math Drops Between 2019 and 2022

(Eighth-grade mathematics scores declined in 51 states/jurisdictions.)

- **Oklahoma:** -13
- **Delaware:** -12
- **West Virginia:** -12

- **Maryland:** -11
- **New Jersey:** -11
- **Massachusetts:** -11
- **Pennsylvania:** -11
- **Minnesota:** -11

MORE:

Academic Recovery for K-12 Students to Cost $700 Billion

4th-Grade Reading Drops Between 2019 and 2022

(Fourth-grade reading scores declined in 30 states/jurisdictions.)

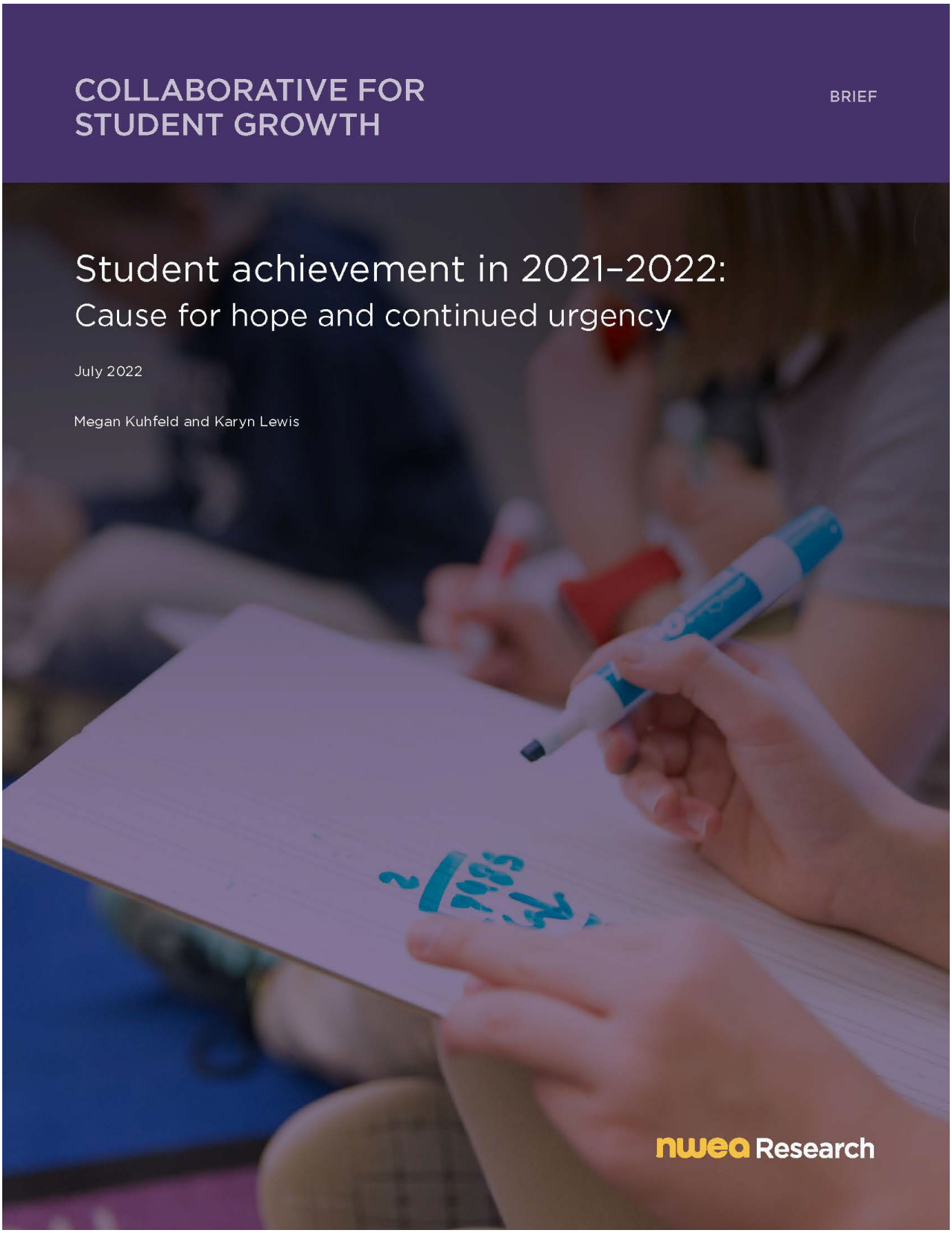
- **Virginia:** -10
- **Delaware:** -9
- **Maine:** -8
- **Oklahoma:** -8
- **West Virginia:** -8
- **Idaho:** -8

8th-Grade Reading Drops Between 2019 and 2022

(Eighth-grade reading scores declined in 33 states/jurisdictions)

- **Maine:** -8
- **Oklahoma:** -7
- **Delaware:** -7
- **Oregon:** -7
- **Kansas**: -7

REPORT FOOTNOTE TWO:



KEY FINDINGS

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

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

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

Terminology

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

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

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

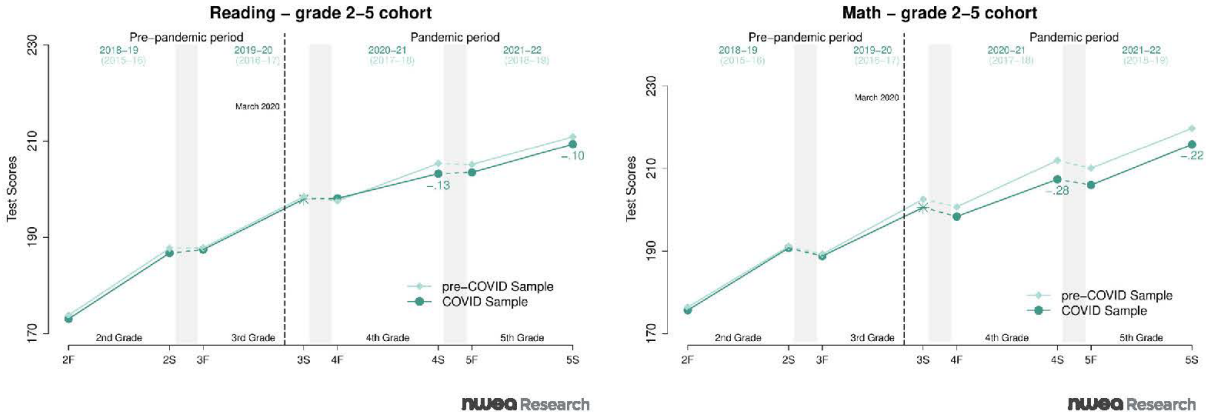
Recovery: We define recovery as—at minimum—reaching equivalence with pre-pandemic achievement levels. However, we note that significant educational inequities predate the pandemic, and a goal of returning to a pre-pandemic status quo will be insufficient to ameliorate these inequities.

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

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

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

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



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

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

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

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

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

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

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

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

nwea Research

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

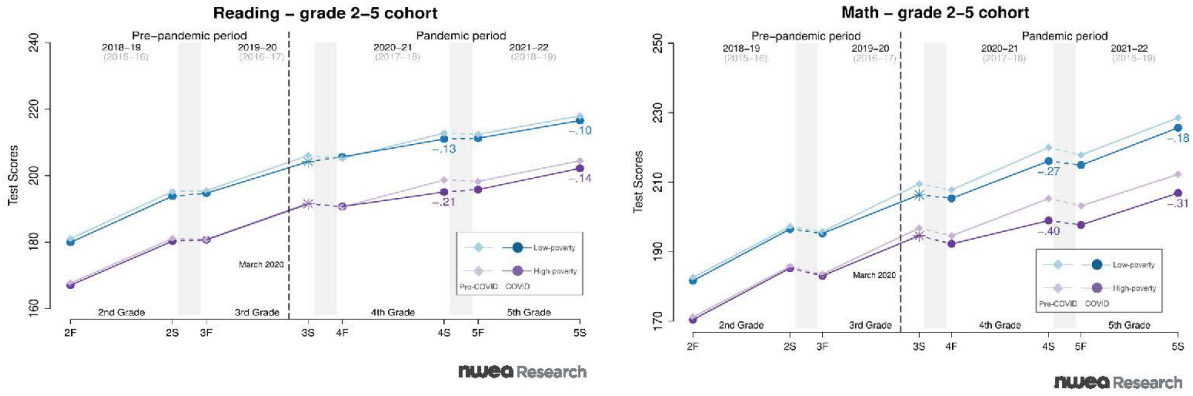
[3] As a point of reference, the math standardized gaps reported in Figure 1 (and Table 1) are significantly larger than estimated impacts from other large-scale school disruptions, such as when math scores dropped 0.17 SDs in the year following Hurricane Katrina.[vi] For further information on understanding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

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

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

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

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



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

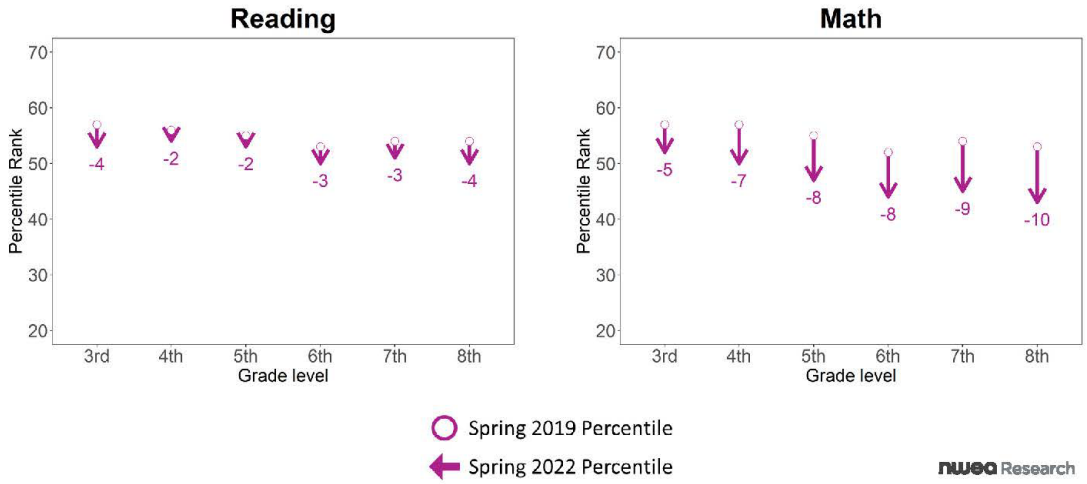
[4] "Low poverty" is defined as less than 25% free or reduced priced lunch (FRPL) eligibility while "high poverty" is greater than 75% FRPL eligibility. School poverty data comes from the 2019–20 Common Core of Data files released by the National Center for Education Statistics.[x]

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

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

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

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



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

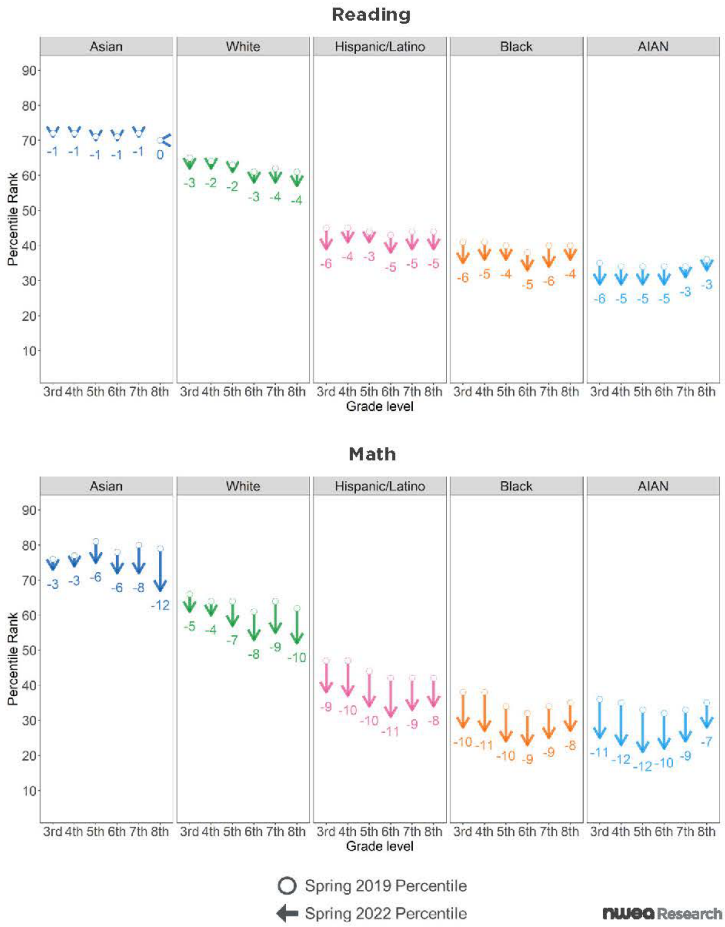
[6] Our published reports use the shifting samples of schools and students who take MAP Growth over time (depending on the number of schools and students testing across terms). Therefore, previous reports reflect slightly different testing populations, and comparisons across reports should be made with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

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

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

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

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



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

Summary

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

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

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

Call to action

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

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

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

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

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

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

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

ABOUT THE AUTHORS

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

Dr. Karyn Lewis is the director of the Center for School and Student Progress at NWEA, where she leads a team of researchers who operate at the intersection of K–12 education research, practice, and policy. Her research interests focus on the interplay between students' academic achievement and growth, their social-emotional development and well-being, and how they experience their school's climate. Prior to joining NWEA, she was a senior researcher at Education Northwest/REL Northwest, where she led a diverse portfolio of applied research, technical assistance, and evaluation projects centered around social-emotional learning. Dr. Lewis is a former Data Fellow with the Strategic Data Project at the Harvard Center for Education Policy Research. She completed a National Science Foundation–funded postdoctoral fellowship at the University of Colorado Boulder and earned a PhD from the University of Oregon in social psychology.

ABOUT NWEA

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

ABOUT THE COLLABORATIVE FOR STUDENT GROWTH

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

ABOUT THE CENTER FOR SCHOOL AND STUDENT PROGRESS

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

ABOUT MAP GROWTH

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

nwea

NWEA is a not-for-profit organization that supports students and educators worldwide by providing assessment solutions, insightful reports, professional learning offerings, and research services. Visit NWEA.org to find out how NWEA can partner with you to help all kids learn.

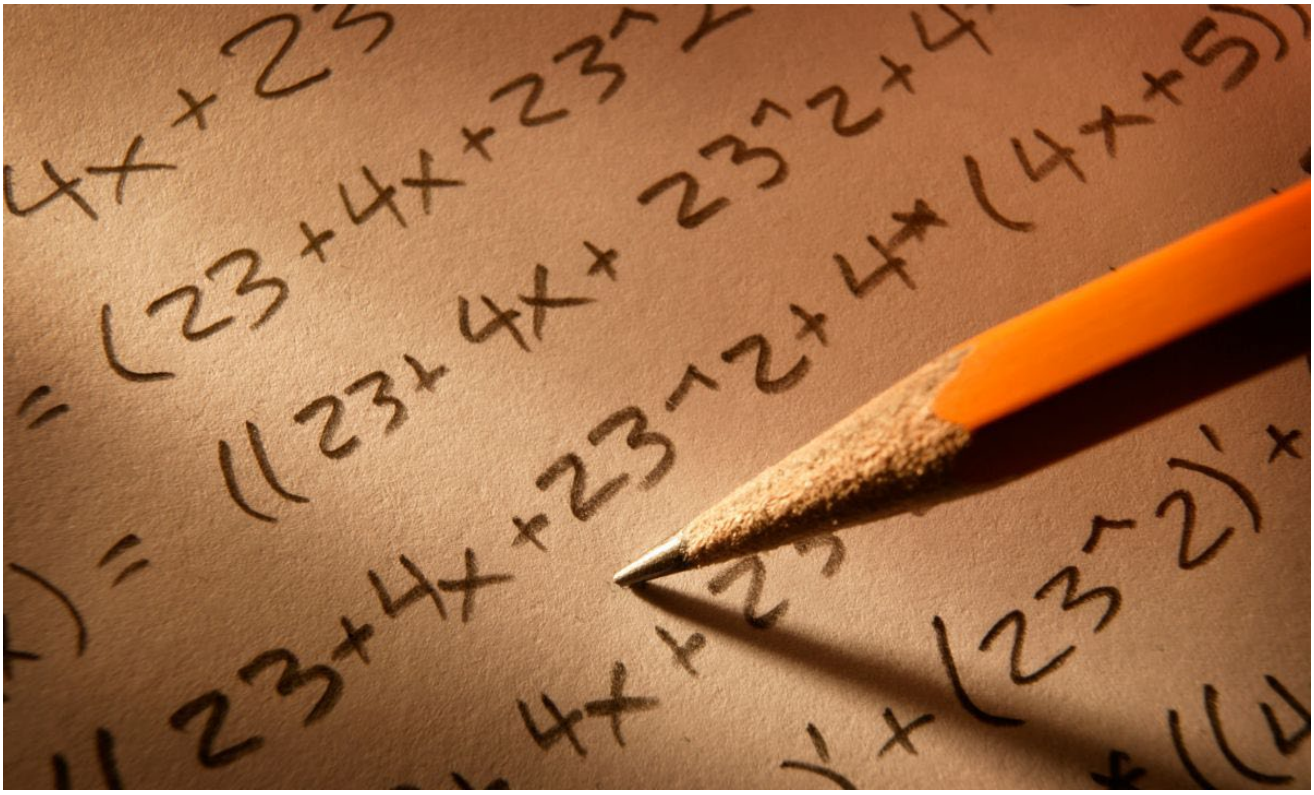
JUL22 | KAP9308

REPORT FOOTNOTE THREE:

Citation: https://www.the74million.org/article/learning-loss-is-worse-than-naep-showed-middle-school-math-must-be-the-priority/. Accessed, June 21, 2023.

Learning Loss Is Worse than NAEP Showed. Middle School Math Must Be the Priority

WAKELYN: TRACKING THE SAME STUDENTS FROM GRADE TO GRADE MAKES CLEAR THE DECLINE IN MIDDLE SCHOOL MATH IS FOUR TIMES GREATER THAN THE DROP IN ENGLISH



By David Wakelyn

December 14, 2022

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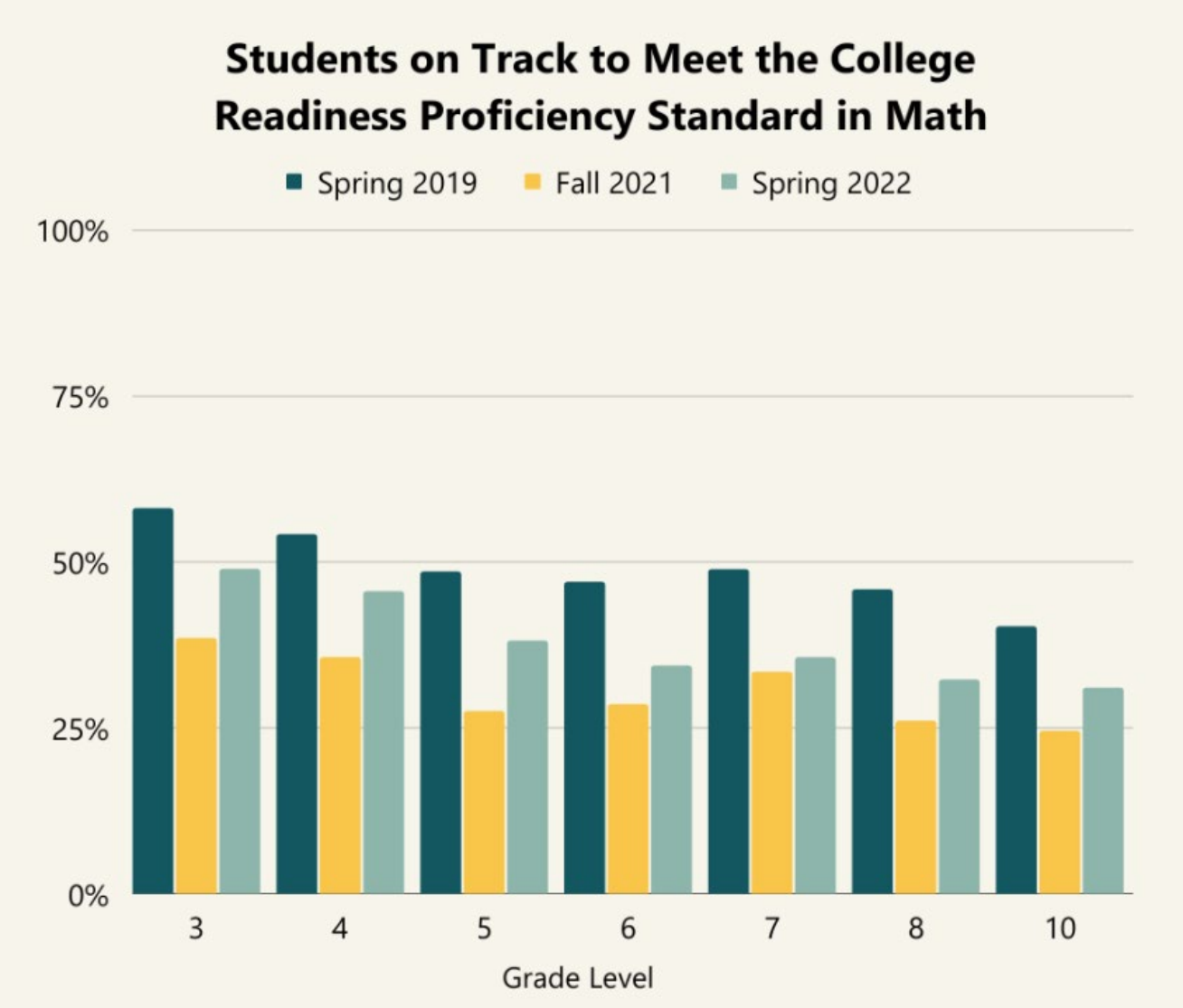
Would you compare the 2018 Los Angeles Lakers to the 2022 Lakers? Last year's team won 40% of its games, a decline of 2.4% from 2018. Both teams wore purple and gold uniforms and played basketball — but that is all they have in common. None of the 24 players on the 2018 team and the 25 on the 2022 team were the same.

NAEP data released last month showed estimated learning losses for the average student in grades 3-8 of the equivalent of a half year of learning in math and a quarter of a year in reading.
But as with the Lakers, these are not the same students. NAEP offers snapshots of different students in the same grade at different points in time. State data allows schools to follow the same groups of students over time. But state and district leaders don't do this. Instead, they display data in a way that understates how severely students have been struggling with middle school math, before and during the pandemic. When tracking the same students from grade to grade, it becomes clear that the decline in middle school math is four times greater than the drop in English language arts.
For example, consider Washington, where the Office of the Superintendent of Public Instruction released this bar chart of achievement grade by grade, with the headline "State Test Scores a Promising Signal of Pandemic Recovery":



Focus on eighth-grade math for a minute. In the accompanying press release, State superintendent Chris Reydkal called the data encouraging, and yes, there's upward movement from 2021 to 2022. But those aren't the same students. The eighth graders in 2022 were third graders in 2017, and as a group they are slated to graduate from high school in the Class of 2026. Following middle school students over time as they move through school, here are the trends:

Middle School Math Students Need the Most Help

Average Decline is 4X Greater Following Students Over Time (2017-2022)

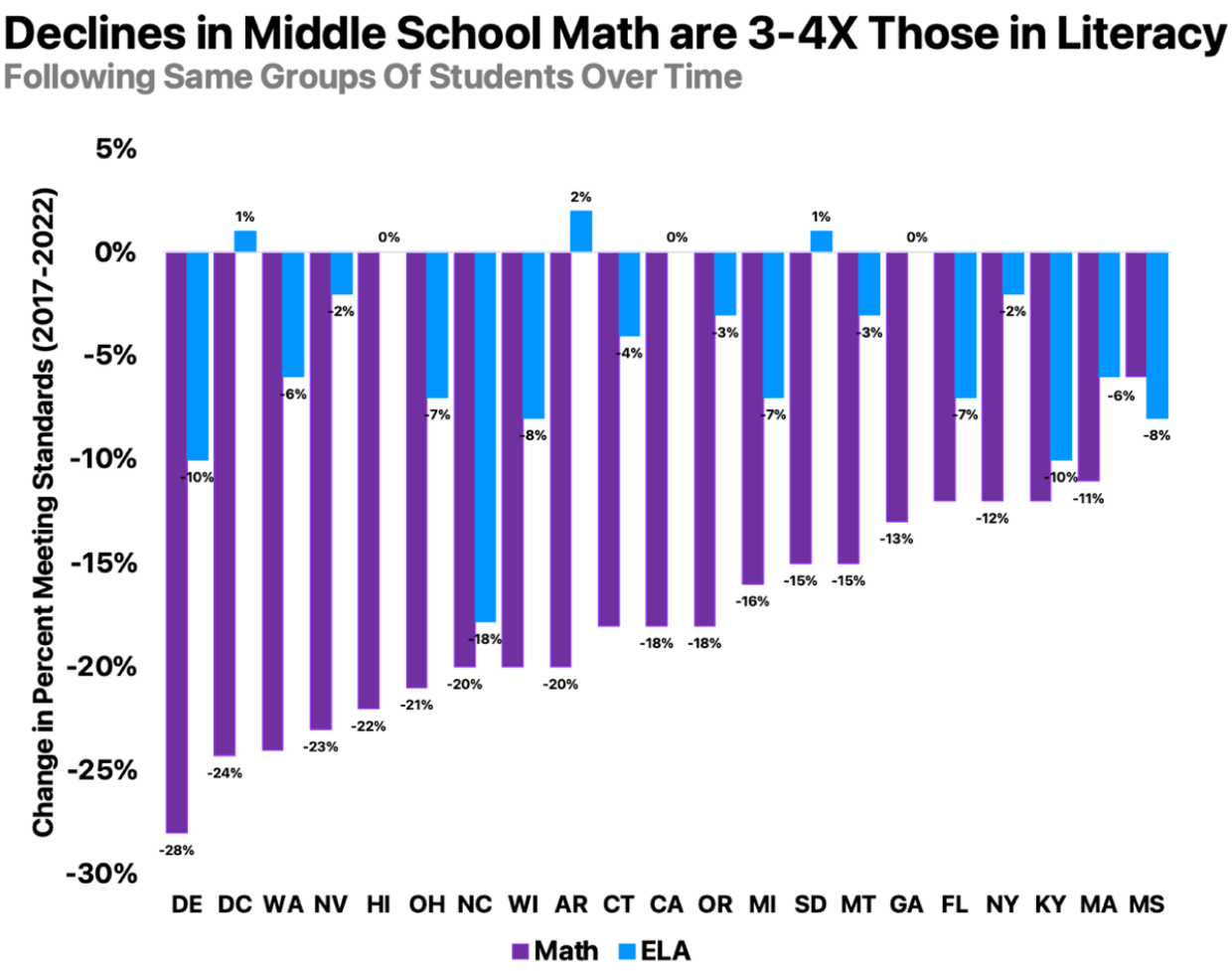
	3rd Grade	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade	CHANGE
Class of 2026	58%	54%	48%	---	28%	32%	-25%
Class of 2027	58%	54%	---	27%	35%		-22%
Class of 2028	58%	---	36%	34%			-24%

Same Students Are Recovering More Rapidly in ELA

Class of 2026	52%	57%	60%	---	46%	49%	-3%
Class of 2027	56%	57%	---	47%	51%		-5%
Class of 2028	55%	---	46%	44%			-11%

Source: Washington Office of Superintendent Public Instruction (https://www.k12.wa.us/data-reporting/data-portal)

Washington is not alone. This pattern holds across 20 states and Washington, D.C., where sufficient data is publicly available, representing half of the nation's students. The average decline in middle school achievement is 16% in math and 4% in English among the same groups of students:



To be clear, this slide was happening before the pandemic. But because districts and states were not following the same students over time, they missed seeing the severity of the problem, and the pandemic exacerbated it. Now, as many as 1 million students who met college and career-ready math standards in third grade are now off track.

Isn't early reading in worse shape? Research by Amplify finds that 50% of K-3 students are on track to read at grade level, compared with 58% before the pandemic. NWEA finds that early elementary students have made up ground in reading in the past year. Table 1 in NWEA's July 2022 report shows — but doesn't call out — that middle school math students are the one group faring worse from 2021 to 2022.

Middle school mathematics is uniquely difficult. It's where students need to master fractions and decimals, which predicts their math achievement for the rest of high school. If students don't learn fractions well, the ramp that

leads from arithmetic up to algebra becomes a wall. Poor knowledge of fractions may lead students to give up trying to make sense of math altogether.

What next? Smart ideas are floating in the field, but implementing them is the greatest challenge. Here are four actions for district and state leaders to consider.

First, start following the same students over time to assess the extent of their recovery. (While the size of classes can rise and fall within schools, the population remains stable across most states.)

Second, schools need to evolve toward mastery learning, in which students are given the time they need to meet standards, including in math. It's a term with a lot of hype, and past implementation efforts have underdelivered on results. Nonetheless, all the learning opportunities lost during the last two years means time needs to be variable and learning expectations need to be fixed. Michael Horn's new book *Reopen to Reinvent* and the Aurora Institute offer advice on how schools might thoughtfully implement mastery learning practices.

Third, middle school math students need more time and where possible, double-dose courses. Over a year, a double dose of math has been shown to produce gains equivalent to a quarter of a year of extra learning.

Finally, even the best guides on making up unfinished learning lack advice on how to help math students who are three or more years behind. The U.S. Department of Education is hosting five sessions between October 2022 and February 2023 to help teachers, education leaders and policymakers learn about strategies and programs to support students' academic recovery. Unfortunately, the agendas for these sessions do not mention the unique challenges of middle school math. The best minds in middle school mathematics need to assemble in a national summit, where they can carefully think through this problem and offer advice to states, districts and schools.

When everything seems like a crisis, it can be hard to set priorities. The data here shows that at least 1 million students are on the verge of being functionally unable to use math in the real world. As state and district

leaders work to repair the academic damage of the last two years, middle school math needs to be a top concern.

REPORT FOOTNOTE FOUR:

Citation: https://nces.ed.gov/nationsreportcard/. Accessed, June 21, 2023.

REPORT FOOTNOTE FIVE:

Citation: https://ies.ed.gov/ncee/wwc/PracticeGuide/26. Accessed, June 21, 2023.

PRACTICE GUIDE

Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades

Released: March 2021
Summary document (638 KB)
Full Guide (1.9 MB)

Recommendations | **Details** | **Panel** | **Related Resources**

This practice guide provides evidence-based practices that can help teachers tailor their instructional approaches and/or their mathematics intervention programs to meet the needs of their students.

1 Systematic Instruction: Provide systematic instruction during intervention to develop student understanding of mathematical ideas. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG
2 Mathematical Language: Teach clear and concise mathematical language and support students' use of the language to help students effectively communicate their understanding of mathematical concepts. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG
3 Representations: Use a well-chosen set of concrete and semi-concrete representations to support students' learning of mathematical concepts and procedures. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG
4 Number Lines: Use the number line to facilitate the learning of mathematical concepts and procedures, build understanding of grade-level material, and prepare students for advanced mathematics. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG
5 Word Problems: Provide deliberate instruction on word problems to deepen students' mathematical understanding and support their capacity to apply mathematical ideas. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG
6 Timed Activities: Regularly include timed activities as one way to build fluency in mathematics. ▾ Show More	STRONG EVIDENCE	TIER 1 STRONG

REPORT FOOTNOTE SIX:

Citation: https://intensiveintervention.org/resource/principles-designing-intervention-mathematics. Accessed, June 21, 2023.

Principles for Designing Intervention in Mathematics

Resource Type

Documents

Developed By

National Center on Intensive Intervention

The purpose of this guide is to provide brief explanations of practices that can be implemented when working with students in need of intensive intervention in mathematics. Special education instructors, math interventionists, and others working with students who struggle with mathematics may find this guide helpful. Specific topics covered include the following:

- Explicit, Systematic Instruction
- Effective Questioning
- Concrete, Representational/Visual/Pictorial, Abstract/Symbolic Models
- Teaching Mathematical Vocabulary and Symbols
- Fluency Building
- Error Analysis

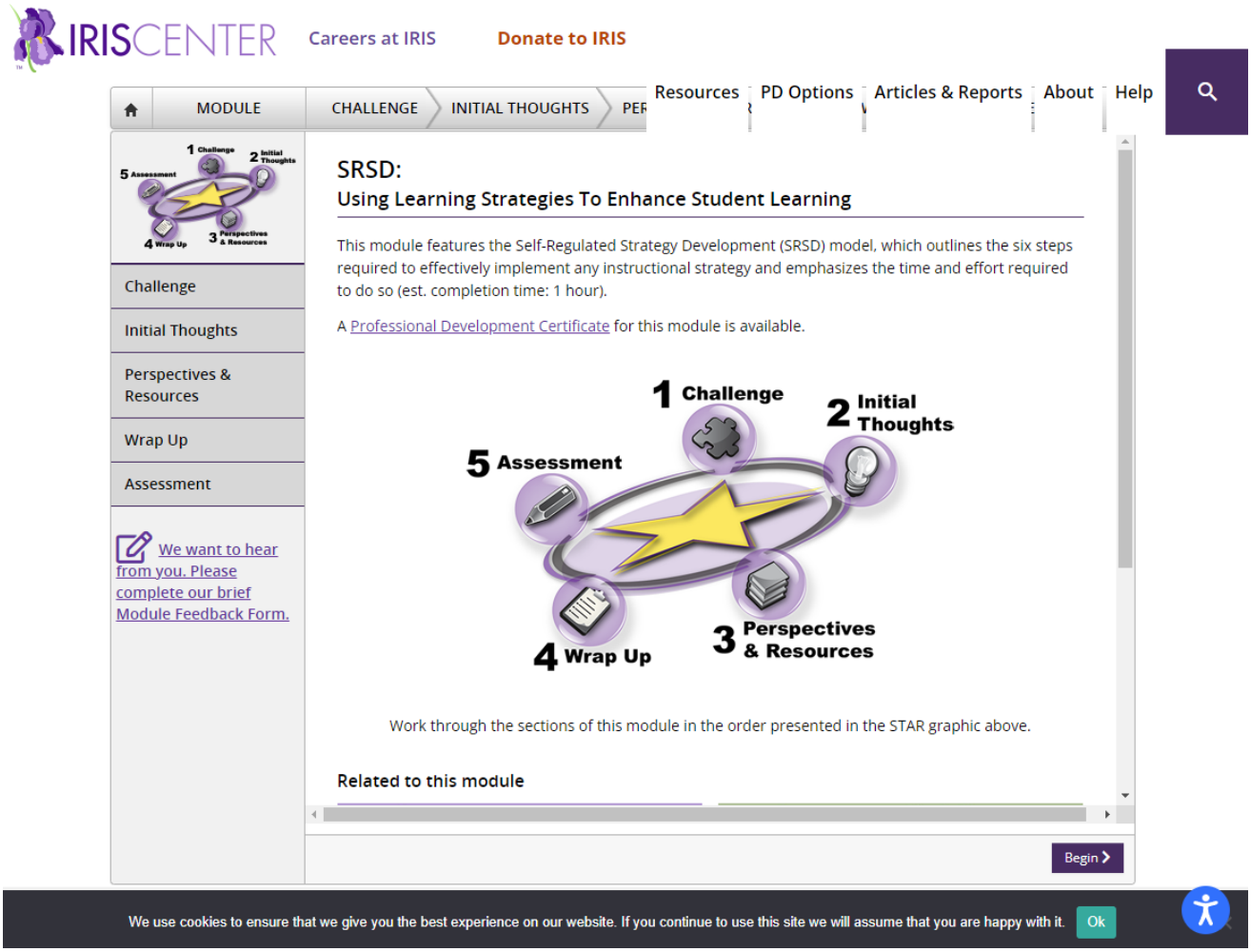
Principles for Designing Intervention in Mathematics

Related Resources

View related math resources

REPORT FOOTNOTE SEVEN:

Citation: https://iris.peabody.vanderbilt.edu/module/srs/. Accessed, June 21, 2023.



REPORT FOOTNOTE EIGHT:

Citation: https://epicedpolicy.org/wp-content/uploads/2022/09/Yr4_PartnershipRpt_Full.pdf. Accessed, June 21, 2023.

REPORT FOOTNOTE NINE:

Citation: https://www.doe.mass.edu/turnaround/howitworks/research-brief.pdf. Accessed, June 21, 2023.

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September 2016

Prepared for the Massachusetts Department of Elementary and Secondary Education

Office of District and School Turnaround

How to Succeed in School Turnaround:
Strategies That Characterize Successful Turnaround Schools in Massachusetts

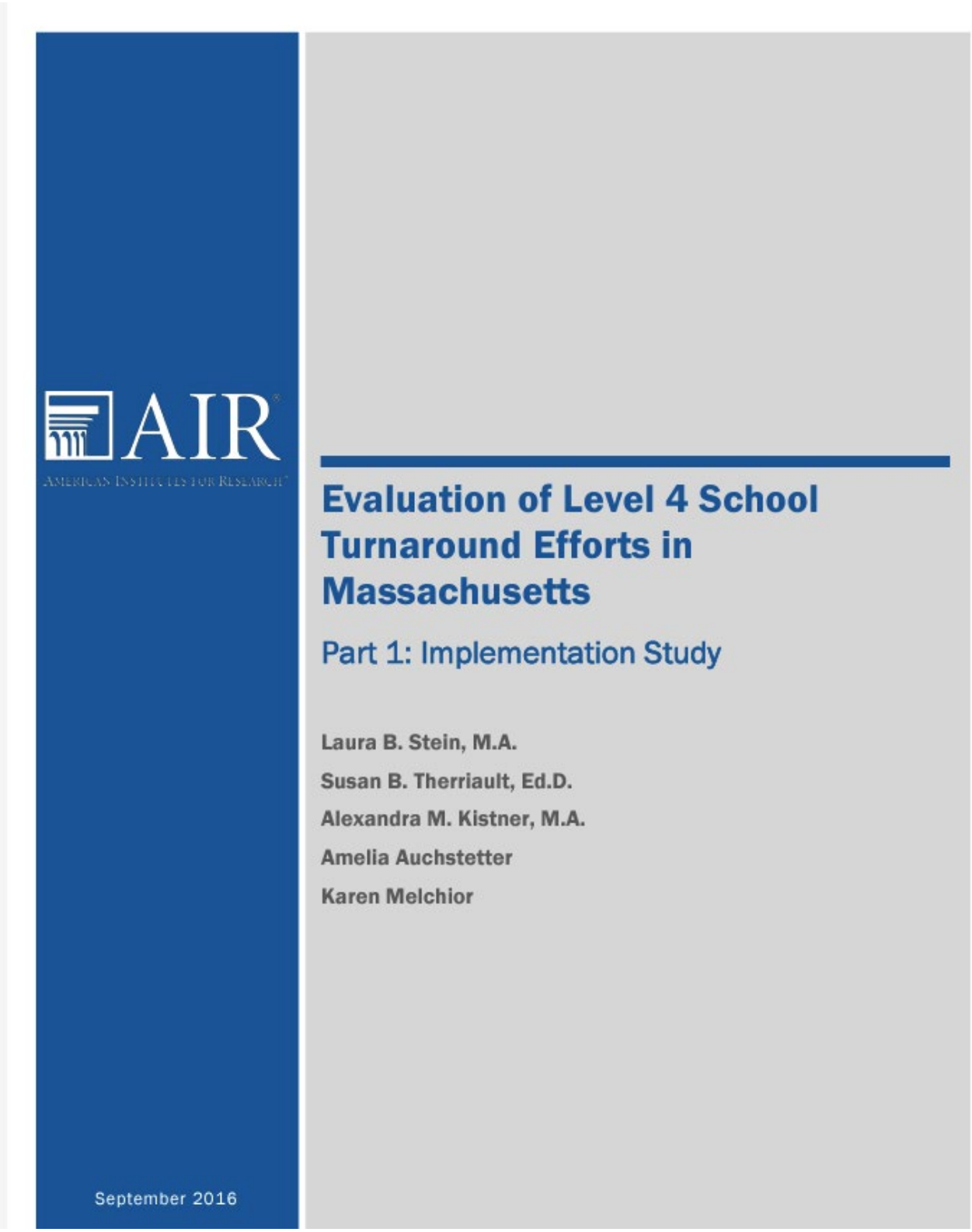
In 2013, the Massachusetts Department of Elementary and Secondary Education (ESE) collaborated with American Institutes for Research (AIR) to measure the impact of School Redesign Grants (SRGs) on student academic performance. In 2016, AIR replicated these analyses with additional schools and years of performance data. Both studies showed that students in SRG schools performed better on the English language arts and mathematics sections of standardized state assessments than students in non-SRG schools.

Despite the positive impact of SRGs observed in these schools overall, compared with non-SRG schools, not all schools receiving an SRG have improved student outcomes and exited turnaround status. The current study explored why some schools receiving an SRG have been able to improve student outcomes while others have not. Results from the study contributed to a technical report for researchers, a turnaround practices field guide for practitioners, and this research brief, which summarizes key findings from both components, along with two new videos for ESE's Turnaround Practices in Achievement Gain Schools series.

Study Overview. For this study, AIR focused on a subset of current and exited Level 4 schools that have received SRGs. We used data collected from current Level 4 schools for the 2014–15 Massachusetts School Monitoring Site Visits (see sidebar on Page 2), along with survey data collected from exited schools, to identify a set of schools demonstrating promising strategies for successful turnaround, as evidenced by high monitoring site visit ratings or prior exit from Level 4 status. The figure below shows the relationship between all Level 4 schools (dark blue) and the schools selected for inclusion in this study (light blue). Strategies highlighted in this research brief were described as essential in improving and continuous improvement schools, while struggling schools often found these same topic areas challenging to address.

REPORT FOOTNOTE TEN:

Citation: https://www.doe.mass.edu/turnaround/howitworks/research-brief.pdf. Accessed, June 21, 2023.


AIR
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Evaluation of Level 4 School Turnaround Efforts in Massachusetts

Part 1: Implementation Study

Laura B. Stein, M.A.
Susan B. Therriault, Ed.D.
Alexandra M. Kistner, M.A.
Amelia Auchstetter
Karen Melchior

September 2016

REPORT FOOTNOTE ELEVEN:

Citation: https://commitpartnership.org/blog/equity-works-ace-results. Accessed, June 21, 2023.

Equity Works: Accelerating Campus Excellence (ACE) Results

Seven campuses educating roughly 4,000 students across four elementary and three middle schools were placed in the first cohort of ACE campuses that launched in the 2015-2016 school year. With the recent release of 5th and 8th grade STAAR scores for 2018, the student achievement growth that these campuses have seen in just three years has been substantial.

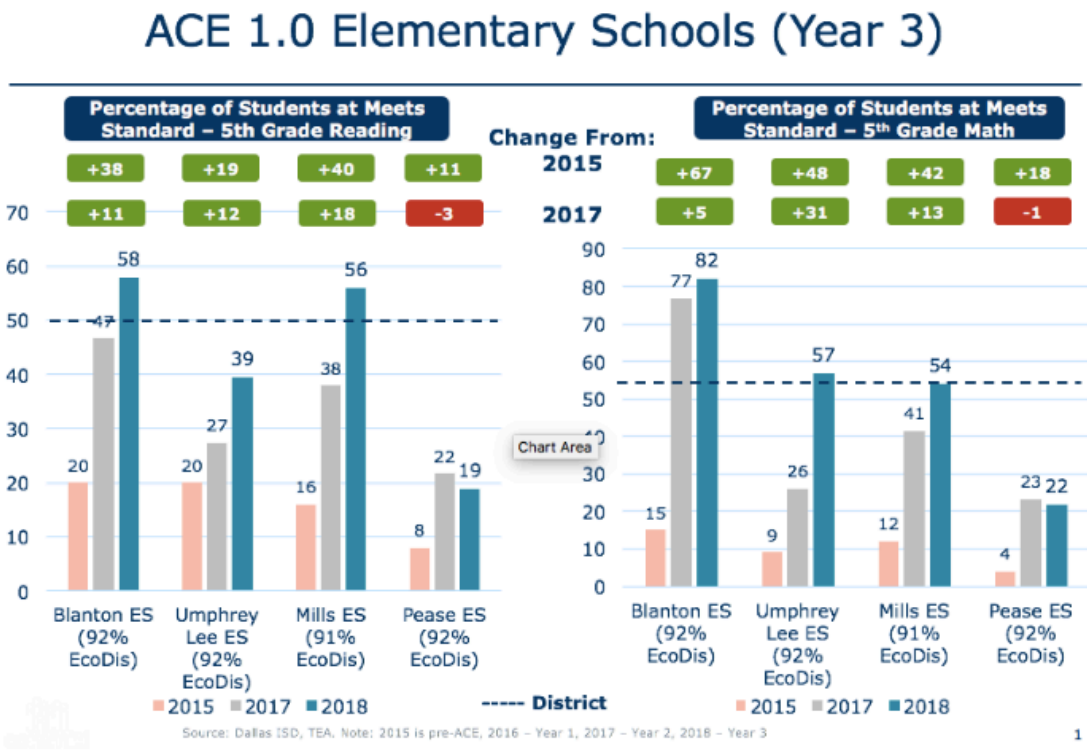
15 May 2018

Three years ago, Dallas ISD launched their Accelerating Campus Excellence (ACE) effort as a comprehensive equity strategy to transform some of the lowest performing schools in the district and the state. All campuses had been on the State of Texas 'Improvement Required' list for consecutive years, placing them within the bottom 5% of schools statewide based on student achievement.

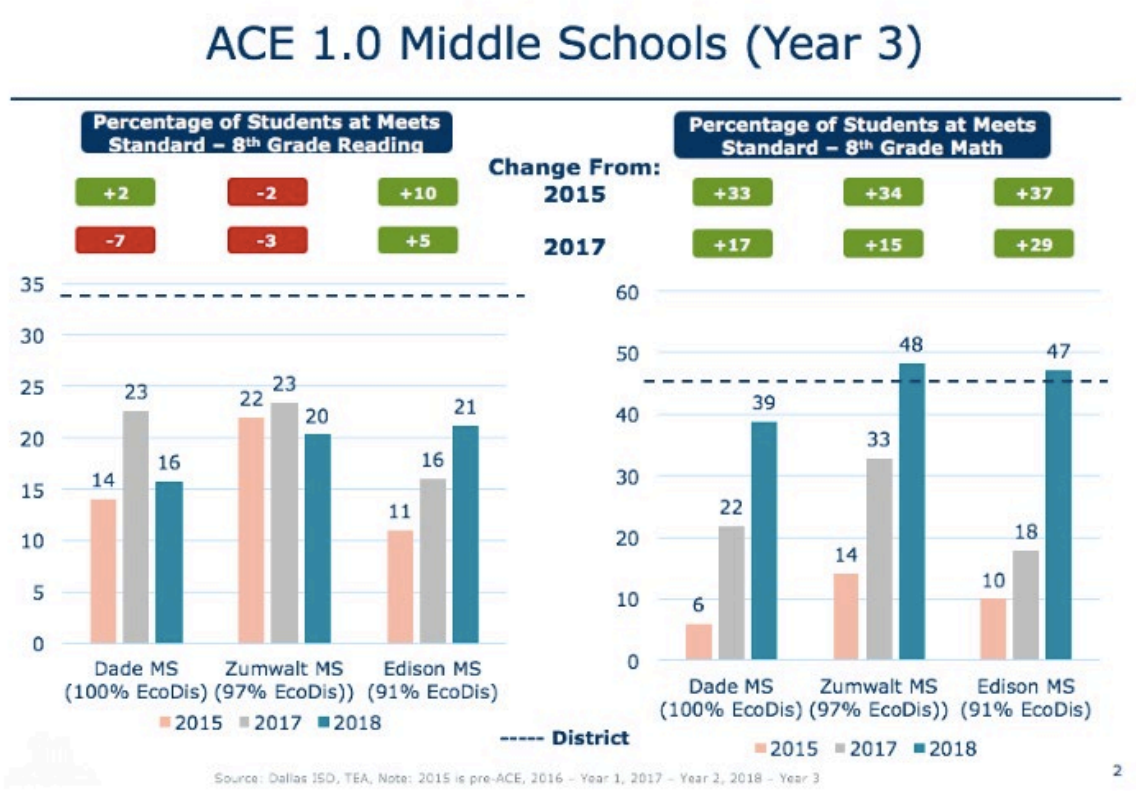
The ACE effort is centered on providing a more equitable distribution of the district's most valuable resource, as it financially incentivizes the district's more effective teachers and principals to collectively work in its highest-need schools. The program also supports learning by providing a longer school day, after hours enrichment, and three hot meals per day to better support the whole child.

Seven campuses educating roughly 4,000 students across four elementary and three middle schools were placed in the first cohort of ACE campuses that launched in the 2015-2016 school year. With the recent release of 5th and 8th grade STAAR scores for 2018, the student achievement growth that these campuses have seen in just three years has been

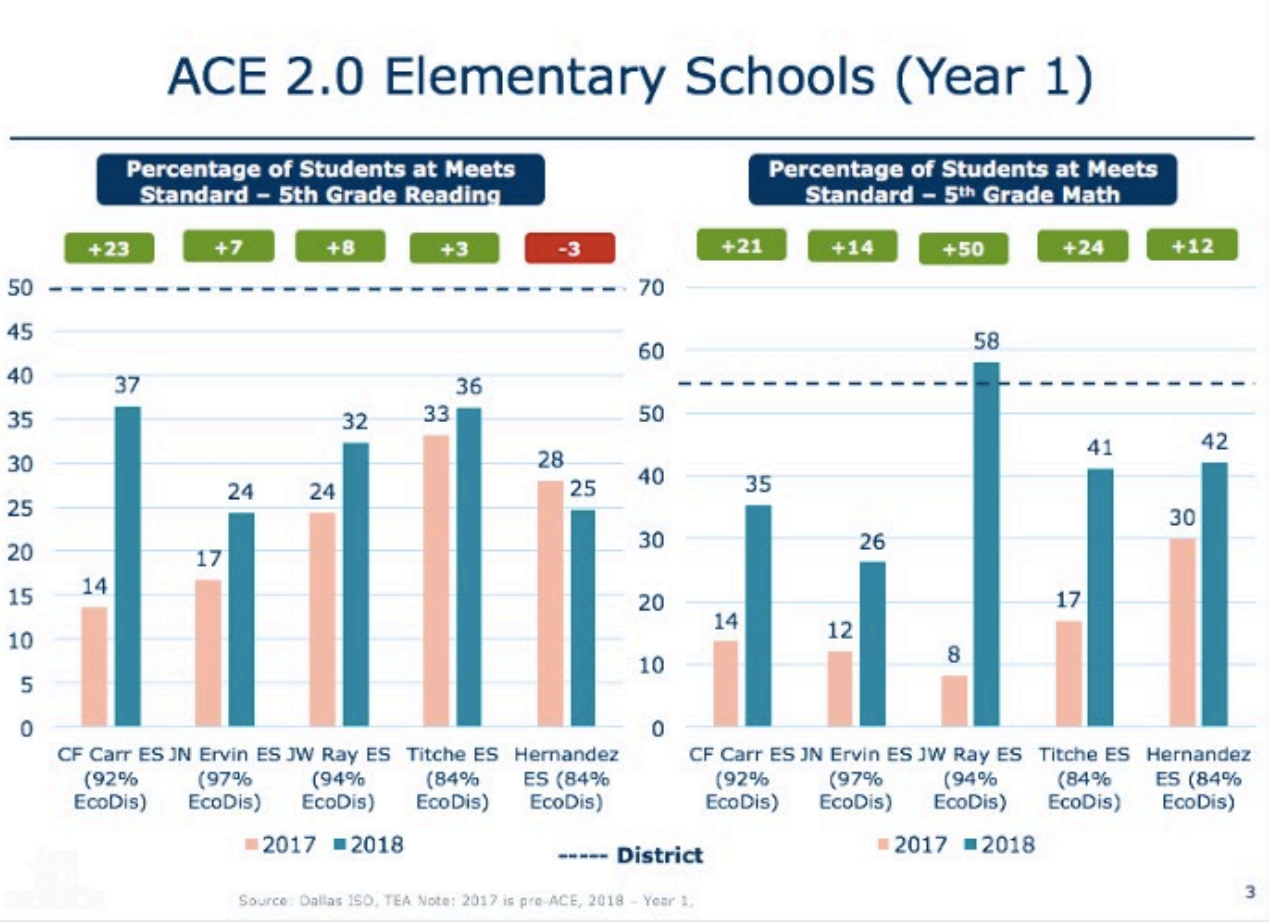
substantial. All ACE elementary school campuses have seen double digit STAAR score growth compared to pre-ACE scores of 2015, including percentage gains of 40 to 65 percentage points at select campuses that were some of the lowest performing in the state just three years ago.



Middle schools have reflected 30 point gains in math achievement across all campuses, while reading scores, though improved, have seen lower increases (once again highlighting the importance of early reading proficiency as later remediation efforts can be quite difficult and expensive).



The second cohort of Dallas ISD ACE campuses were launched this school year, and already the impact of the program can be seen on student achievement. Math scores are up by double digits, including an amazing 50 percentage point gain at J.W. Ray Elementary, a campus that had been on the state's Improvement Required list for four years. Nearly all schools showed growth in reading, including a very notable 23 percentage point gain at Carr Elementary in West Dallas.



And the single Cohort 2 middle school (Thomas Rusk) reflected double digit growth in both reading and math.

What we believe this shows us is that equity works, particularly when we focus on equity in educator effectiveness. Its cost of approximately $1,300 per student, while significant, appears to be showing much higher impact than other turnaround strategies. The ACE model continues to provide a district framework that ensures that not only are a district's more effective teachers working with the students with larger needs, but that the school is seen as a safe, warm, welcoming place, where children's social-emotional needs are met.

Urban and suburban schools and school districts across the country are struggling to address various student achievement gaps based on both race and

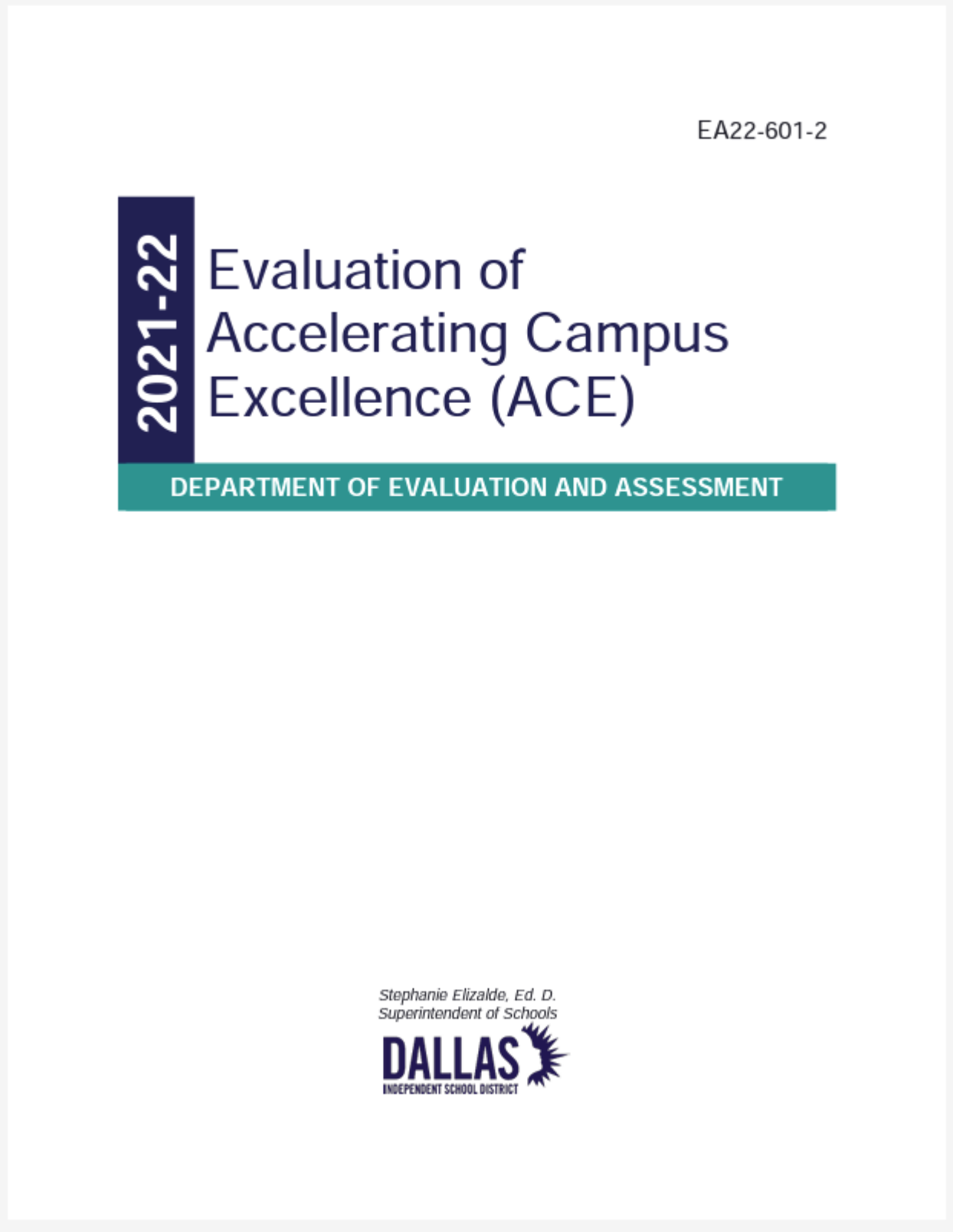
income. The ACE program continues to show real promise - not as a silver bullet, but as a comprehensive effort to care for the needs of the whole child while ensuring access to excellent instructional quality.

Given the success of ACE, school districts across the State of Texas are taking notice and looking at ways they can learn from the effort and even implement ACE within their own schools. **Best in Class**, a coalition launched by the Communities Foundation of Texas and Commit, is providing technical support and strategic advice to many of these districts as they seek to model and replicate the success of this innovative Dallas ISD effort.

If you are a school district official interested in learning more about how ACE can help you provide equity in the pursuit of narrowing or eliminating achievement gaps, please contact **Dottie Smith** or **Betsy Cook** with Best in Class.

REPORT FOOTNOTE TWELVE:

Citation: https://www.dallasisd.org/cms/lib/TX01001475/Centricity/domain/98/evaluation/21-22/acadpe/EA22-601-2%20FULL%20Accelerating%20Campus%20Excellence%20ACE%20Program.pdf. Accessed, June 21, 2023.



EA22-601-2

2021-22

Evaluation of Accelerating Campus Excellence (ACE)

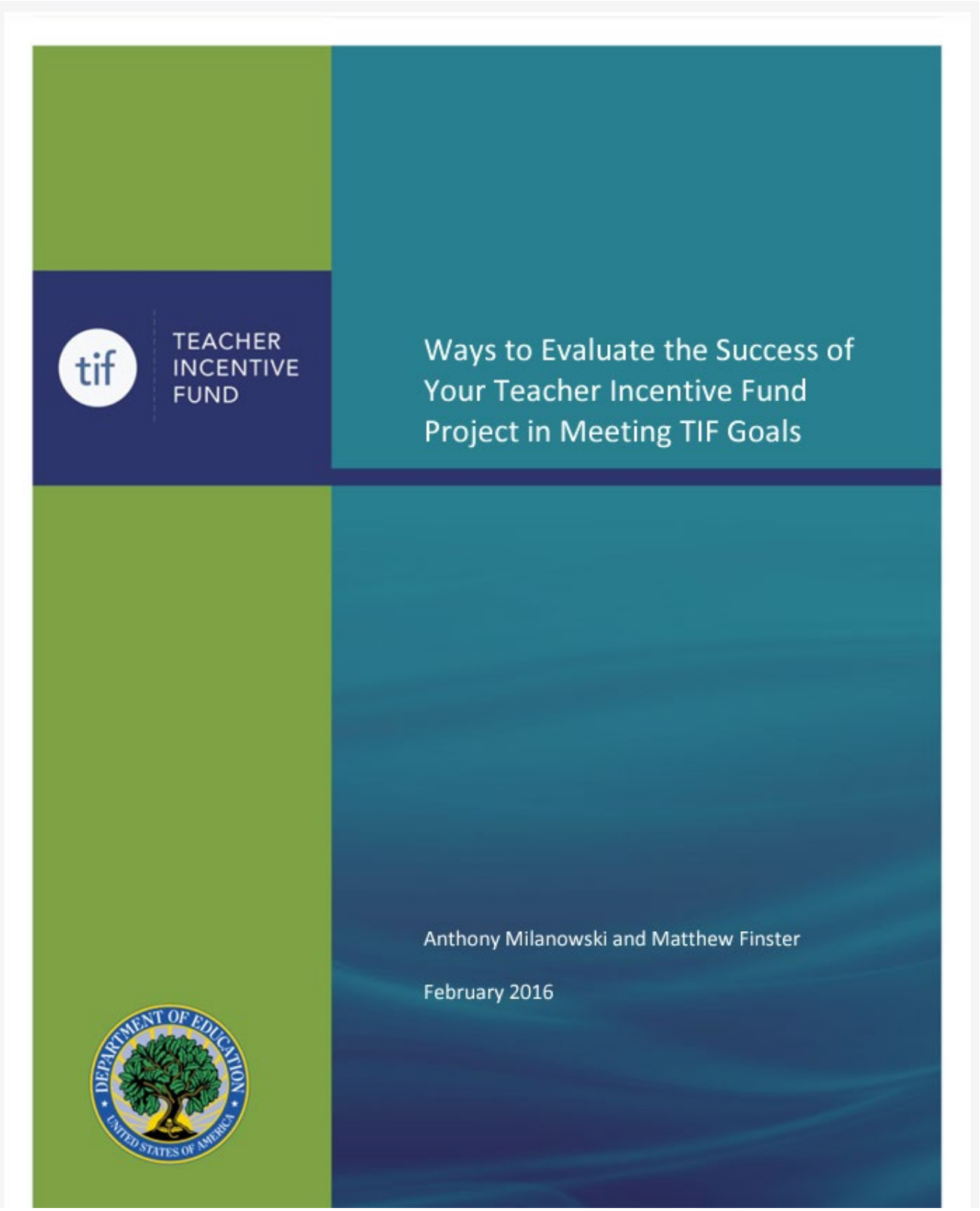
DEPARTMENT OF EVALUATION AND ASSESSMENT

Stephanie Elizalde, Ed. D.
Superintendent of Schools

DALLAS INDEPENDENT SCHOOL DISTRICT

REPORT FOOTNOTE THIRTEEN:

Citation: https://files.eric.ed.gov/fulltext/ED568702.pdf. Accessed, June 21, 2023.



REPORT FOOTNOTE FOURTEEN:

Citation: https://www.mathematica.org/publications/promoting-educator-effectiveness-the-effects-of-two-key-strategies. Accessed, June 21, 2023.

Promoting Educator Effectiveness: The Effects of Two Key Strategies

NCEE Evaluation Brief

Published: Mar 21, 2018

Publisher: *Washington, DC: Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance*

EY FINDINGS

Key Findings:

- Providing educators with performance feedback and offering pay-for-performance bonuses can improve student achievement. Across years of implementation, each tested strategy sometimes had a positive cumulative impact on students' math or reading achievement.
- Features of the measures or programs and on-the-ground implementation may limit the effectiveness of the program strategies. Both studies provided evidence that the policy as implemented differed in some ways from the approach envisioned. For example, in the pay-for-performance study, about 40 percent of the teachers were unaware they were eligible to receive a performance bonus.

- Educators can be receptive to some of the evaluation and compensation strategies supported by TIF and TSL. Sixty-five to 84 percent of the educators reported being satisfied with the feedback they received on their practices. In addition, pay-for-performance ultimately led to improvements in teachers' satisfaction with some aspects of their jobs.

This brief brings together the findings of two studies from the Institute of Education Sciences (IES) that examined specific strategies supported by TIF. One study, conducted over two years, examined the effects of using research-based performance measures to evaluate educators and provide them with feedback—a strategy referred to here as performance feedback. The second study, conducted over four years, evaluated the effects of offering bonuses to educators based on their performance ratings—a strategy referred to as pay-for-performance. Although no single large-scale study has evaluated the effects of a full, comprehensive program, like those supported by TIF and TSL, these studies can provide insight on the potential effects of two strategies that are prominent in such programs. In addition, evidence from both studies suggests areas of potential improvement for programs that support or expand human capital initiatives in schools and highlights potential avenues for future research.

REPORT FOOTNOTE FIFTEEN:

Citation: https://repositories.lib.utexas.edu/bitstream/handle/2152/88059/TAYLOR-TREATISE-2021.pdf?sequence=1&isAllowed=y. Accessed, June 21, 2023.

Abstract Meaningful Impact: A Case Study of a Multiple-Measure Teacher Evaluation System Abigail Ramage Taylor, Ed.D. The University of Texas at Austin, 2021 Supervisor: Pedro Reyes

Effective teachers lead students to improved academic outcomes; therefore, it is critical for the field to understand best practices related to measuring teacher effectiveness. Increasing teacher capacity to positively affect student learning leads to school improvement (Stronge, 2010). When a teacher evaluation system builds teacher efficacy through systematic and rigorous feedback, the evaluation system can contribute to overall school improvement. Current trends support the use of multiple measures of teacher effectiveness (Adnot, Dee, Katz, & Wyckoff, 2017; Darling-Hammond, Amrein-Beardsley, Haertel, & Rothstein, 2012; Jacob, 2012; Phillips & Weingarten, 2013; Rockoff & Speroni, 2010; Steinberg & Kraft, 2017; Steinberg & Sartain, 2015). Multiple-measure teacher evaluation systems are worthy of study because they examine teacher effectiveness, and effective teachers improve students' learning outcomes. Understanding the effective implementation of multiple-measure teacher evaluation systems within Texas is of particular interest due to the 2019 passage of House Bill 3 (HB 3). HB 3 established the Teacher Incentive Allotment, creating a pathway for viii Texas teachers to earn a six-figure salary (Texas Education Agency, 2019). As Texas districts have been incentivized to implement multiple-measure teacher evaluation systems, understanding the effective implementation of these systems within the state is necessary. This study examined the effectiveness of a multiple-measure teacher evaluation system in an urban school district. Using mixed methods, this study examined The Teacher Appraisal Model (TAM), a multiple-measure teacher evaluation system implemented in a Texas school district, South Independent School District (SISD). Surveys, focus groups, and existing administrative data were used in this study. The epistemological origin of this study is subjectivism, found within the philosophy of interpretivism, as meaning is created from something applied to the object by another source (Crotty, 1998). Process theory (Maxwell, 2013) influenced the interpretation of data and findings. Findings indicate that TAM can help to improve instructional effectiveness when well-implemented. Gaps in perception between teachers and appraisers result from inequitable application of Instructional Domain ratings and diverse views on the value of feedback. Teachers' ratings in the Instructional Domain are greater than their ratings in the Student Outcomes Domain, resulting in misalignment between domain ratings.

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Status, Growth, and Perceptions of School Quality

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ABSTRACT

States and districts are increasingly incorporating measures of achievement growth into their school accountability systems, but there is little research on how these changes affect the public's perceptions of school quality. We conduct a nationally representative online survey experiment to identify the effects of providing participants with information about their local public schools' average achievement status and/or average achievement growth. Prior to receiving any information, participants already possess a modest understanding of how their local schools perform in terms of status, but they are largely unaware of how these schools perform in terms of growth. Participants who live in higher status districts tend to grade their local schools more favorably. The provision of status information does not fundamentally change this relationship. The provision of growth information, however, alters Americans' views about local educational performance. Once informed, participants' evaluations of their local schools better reflect the variation in district growth.

PRIOR to the passage of the Every Student Succeeds Act of 2015 (ESSA), states' public K–12 school accountability systems focused almost exclusively on measures of student achievement *status* (i.e., the level of students' academic performance at a single point in time). ESSA's predecessor, the No Child Left Behind Act of 2002, required states to measure achievement status by administering annual assessments in math and reading in Grades 3 to 8 and once in high school. The results of these assessments factored heavily in schools' accountability ratings, shaping states' efforts to improve educational outcomes as well as public perceptions of school quality. Critics argued that achievement status was a misleading indicator of school quality (Chingos & West, 2015; Rothstein et al., 2008). Schools that served a larger proportion of disadvantaged students tended to perform poorly in terms of achievement status because of their students' lower initial test scores and additional out-of-school obstacles. Conversely, schools that served a larger proportion of students from more advantaged backgrounds tended to perform well by this standard, regardless of the schools' actual contributions to student learning.

ESSA now requires states to use multiple measures to evaluate students and schools (Barone, 2017). The most significant change has been the widespread inclusion of student achievement *growth* (i.e., the rate of improvement in students' academic performance over time), which many education policy researchers consider a better—albeit still imperfect—indicator of school quality than achievement status (Stiefel et al., 2011). Aggregate measures of growth also have a much weaker relationship to the racial, ethnic, and economic composition of the student body (Reardon, 2019). Forty-three states and the District of Columbia include growth in their publicly available school report cards, and another five states plan to include growth in future iterations (Data Quality Campaign, 2019, 2020).

There is considerable variation among states with respect to how they measure growth and how they present growth data to the public. Most states use one of five approaches to measuring growth: value-added scores, student growth percentiles, value tables, gain scores, or growth to standard (for a brief description of each, see Data Quality Campaign, 2019; for a more detailed discussion, see Castellano & Ho, 2013). The 2018–2019 Iowa school report cards offer a particularly accessible example. Their measure of school-level growth appears on the school summary page with a simple graphic, a short description ("Growth is measured using student growth percentiles. A student growth percentile describes a student's growth compared to other students with similar prior test scores"), and a link to a more technical explanation (Iowa Department of Education, 2021). By contrast, the 2018–2019 Alabama school report cards offer a single number to represent school-level growth without additional elaboration (Alabama Department of Education, 2021). Among states that include growth in their summative school accountability scores, the relative weight varies from 20% to 60% (Achieve, Inc., 2019). While only a small subset of the public seeks out school accountability data directly from their state departments of education, many Americans encounter this information on websites like GreatSchools.org or Niche.com that generate school ratings based on state data. GreatSchools.org recently revised its summative school rating formula to place more weight on growth (Barnum, 2020).

There is a robust empirical literature on the effects of achievement status information on the public's perceptions of school quality (Barrows et al., 2016; Chingos et al., 2012; Clinton & Grissom, 2015; Jacobsen et al., 2013, 2014), students' and families' school choices (Corcoran et al., 2018; Hastings & Weinstein, 2008), housing prices (Black, 1999; Figlio & Lucas, 2004; Fiva & Kirkebøen, 2011), school board elections (Berry & Howell, 2007; Holbein, 2016; Payson, 2016), and school tax referenda (Kogan et al., 2016). There is a nascent but growing literature on the effects of achievement growth information on students' and families' school choices (Ainsworth et al., 2020; Valant & Weixler, 2020) and housing prices (Imberman & Lovenheim, 2016). However, to our knowledge, there is no existing research on the effects of growth information on the public's perceptions of school quality more generally. This gap is important because perceptions of school quality are presumably the mediating factor between the distribution of academic performance information and the educational, economic, and political outcomes listed above.

To address this gap, we conducted an experiment embedded in a nationally representative online survey of U.S. adults.[1] We first asked participants to estimate their local school district's performance in terms of status and their local school district's performance in terms of growth. Next, we randomly assigned participants to receive one or

more elements of academic performance information: either the district's national percentile in terms of status, the district's national percentile in terms of growth, both, or neither (to serve as a control group). We then asked participants to evaluate the quality of their local public schools.

This research design allows us to answer multiple, related research questions. First, we can gauge the accuracy of participants' prior beliefs about local status and growth. We can then identify the average effects of providing status information, growth information, or both (representing the fact that when states include growth in their school accountability systems, they generally do so as a supplement to and not a replacement for status) on participants' perceptions of local school quality. The results of this analysis can help us think through the potential consequences of a few different scenarios: the public's perceptions of school quality if (a) states release no new academic performance information, (b) states return to the pre-ESSA approach to accountability focused solely on status, (c) states shift wholesale to a growth-based model of accountability, or (d) states continue to collect and disseminate both types of academic performance information.

We can observe whether these effects vary according to the content of the information (lower vs. higher performance). This allows us to assess whether participants respond differently to good or bad news about their local schools when it comes in the form of status, growth, or both. Moreover, because growth has a much weaker underlying relationship with student demographics than status, we can also examine the extent to which the effects of distributing different kinds of academic performance information vary by the demographic composition of participants' local schools. Our approach does not, however, allow us to assess participants' comprehension of status and growth. Additional research is necessary to understand how the public interprets—or, in some cases, misinterprets—these concepts.

We find that Americans are more familiar with status (which states have used for many years to evaluate schools) than growth (which states have only recently begun to incorporate into their school accountability systems). Regardless of their experimental condition, individuals living in higher status districts tend to grade their local schools more favorably. On average, we observe a small negative effect of giving participants information about local status. However, the magnitude of this effect is roughly the same for participants living in both lower and higher status districts. In other words, Americans already have a rough comprehension of average achievement status in their communities. Confronting this information directly may have a minor depressing effect, but it does not fundamentally change the public's understanding of the distribution of school quality.

By contrast, the provision of information about local achievement growth alters the conventional wisdom about school quality. Among participants who receive growth information alone, the relationship between district status and perceptions of school quality becomes weaker, while the analogous relationship between district growth and perceptions of school quality becomes stronger. When we provide both types of academic performance information, the relationship between district status and perceptions of school quality is generally unaffected, while the relationship between district growth and perceptions of school quality is enhanced. In short, providing information about growth reorients the public's perceptions of school quality to be more in line with a measure that many scholars consider a more accurate indicator of schools' contributions to student learning. Furthermore, the provision of growth information weakens the relationship between the public's perceptions of school quality and the economic background of the student body.

When designing our experiment, we also sought to identify one of the cognitive mechanisms potentially responsible for the effects of status and/or growth information on perceptions of school quality. After asking participants to evaluate their local schools, we also asked them about the importance of academic performance relative to other educational objectives. We expected a priori that the provision of academic performance information would raise the salience of academic outcomes. The results, on the contrary, do not conform neatly to these expectations. On average, the provision of academic performance information has no meaningful effect on the relative importance of academic performance. Among those in lower growth districts, however, the provision of growth information causes

participants to indicate that they think schools should focus less on academic outcomes. The reverse is true in higher growth districts. It may be the case that many participants in lower growth districts do not appreciate or accept this new, negative depiction of their local schools, and they respond by de-emphasizing the importance of academic performance. Similarly, many participants in higher growth districts may be surprised to receive such a positive portrayal, and they respond with additional attention to academic outcomes. It could also be the case that many participants living in lower growth districts are more skeptical of the measures of academic performance featured in our experiment than their peers in higher growth districts. Their responses may reflect this wariness.

To summarize, the public's current perceptions of school quality are largely consistent with the predominant indicator of academic performance over the last few decades: average achievement status as measured by state-standardized tests. The provision of district-level information about average growth can shift the public's perceptions of school quality to be more in line with schools' contributions to student learning. However, portions of the public may be disinclined to embrace growth as a valuable metric. Especially among those living in lower growth districts, the provision of this information may reduce support for schools' academic objectives and/or this particular method of measuring success toward those objectives.

THE EFFECTS OF PUBLIC SERVICE PERFORMANCE INFORMATION

In the last decade, there has been a surge of empirical research on the attitudinal effects of public service performance information in policy domains such as health care, policing, mail delivery, recycling/waste removal, and education (e.g., Baekgaard & Serritzlew, 2015; James, 2011; Marvel, 2016; Walker & Archbold, 2014). Three major findings are particularly relevant to our inquiry. First, recipients of public service performance information respond more decisively to negative reports than to positive reports. The public's satisfaction with local services declines with the provision of evidence about low performance, but the public is generally unmoved by the provision of evidence about high performance (James & Moseley, 2014). Second, information from an independent source (rather than the service provider itself) and information about performance relative to similar institutions (rather than an absolute level of performance) appear to be particularly influential (Barrows et al., 2016; James & Moseley, 2014; James & Van Ryzin, 2017). Finally, individuals' prior beliefs about the quality of local public services shape their interpretation of the evidence they receive. When new information is inconsistent with these prior beliefs, recipients are more likely to misinterpret or discard it (Baekgaard & Serritzlew, 2015).

Achievement Status

Many Americans already possess a nontrivial understanding of achievement status in their communities. Chingos et al. (2012) asked a nationally representative sample of U.S. adults to evaluate the quality of their local public schools. They find that these ratings are positively associated with the percentage of students who scored above the proficiency threshold on their states' standardized tests. This relationship is 2 to 3 times stronger among parents of school-age children, who might be expected to be more familiar with local schools. The provision of new information about achievement status can also shift attitudes toward schools. Researchers have examined the effects of status information on perceptions of school quality in the context of online surveys (Barrows et al., 2016; Clinton & Grissom, 2015; Jacobsen et al., 2014), official school letter grades released by the state (Chingos et al., 2012), and shifts in performance outcomes following the introduction of new state tests (Jacobsen et al., 2013). In most cases, when individuals encounter new information about achievement status, they tend to revise their appraisals of local education institutions downward.

Other scholars have considered the effects of status information on outcomes such as students' and families' school choices, housing prices, school board elections, and school tax referenda. Analyses of school application data in districts with centralized enrollment systems suggest that students and families place a high priority on achievement status (Glazerman & Dotter, 2017; Harris & Larsen, 2015). In large-scale field experiments, the distribution of information about average test scores and graduation rates to low-income students tends to increase enrollment in higher status schools (Corcoran et al., 2018; Hastings & Weinstein, 2008). Moreover, housing values reflect status

differences in nearby schools (Bayer et al., 2007; Black, 1999; Kane et al., 2006), and the release of new information about achievement status also appears to influence housing prices (Figlio & Lucas, 2004; Fiva & Kirkebøen, 2011). In the political realm, improving or declining status—which can be influenced by changing student demographics and is not equivalent to growth—can influence vote choice and turnout in both school board elections and school tax referenda (Berry & Howell, 2007; Holbein, 2016; Kogan et al., 2016; Payson, 2016).

Achievement Growth

The analogous literature on the effects of growth information is smaller but growing rapidly. When exploring the relationship between perceptions of school quality and achievement status, Chingos et al. (2012) also establish that individuals' ratings of local schools are weakly related to differences in growth, but this relationship is largely explained by the fact that school-level average status and school-level average growth are moderately correlated. After controlling for achievement status, the relationship between growth and ratings is not statistically significant. This is consistent with work by Abdulkadiroglu et al. (2020) and Beuermann et al. (2020), indicating that families generally prioritize attributes other than growth when ranking their school options in a centralized school enrollment system. However, survey and field experiments suggest that the provision of growth information can steer participants toward schools and districts that exhibit higher growth rates (Ainsworth et al., 2020; Houston & Henig, 2021; Schneider et al., 2018; Valant & Weixler, 2020). On the contrary, the release of Los Angeles Unified School District teacher and school value-added data in the *Los Angeles Times* had no effect on housing prices—although this situation may have been atypical given the controversial nature of the data release (Imberman & Lovenheim, 2016). In sum, the available evidence suggests that Americans possess little prior knowledge about school performance in terms of growth, and the provision of this information may have considerable influence on their attitudes toward those educational institutions.

Multiple Educational Objectives

A consistent challenge with respect to measuring educational performance is the multiplicity of objectives that schools are expected to pursue: cultivating students' academic skills, civic values, social and emotional well-being, artistic appreciation, athletic ability, and much more (Jacobsen, 2009; Ladd & Loeb, 2013; Rothstein et al., 2008). Previous work by Jacobsen et al. (2015) indicates that individuals with different normative expectations for schools—either a heavy emphasis on academic outcomes or a more equal balance among multiple educational objectives—react differently to academic performance information. Those who place greater emphasis on students' academic development tend to respond more negatively to indications of lackluster performance on standardized tests. By contrast, those who prefer more balance between academic and nonacademic objectives appear to be less critical of schools that underperform on standardized tests if they are strong in other areas. We are unaware of research that examines the converse relationship: how the provision of academic performance information can influence attitudes about the optimal balance between various educational objectives.

Priming Versus Learning

When studying the effects of public service performance information, it is important to consider whether the results we observe are due to participants learning something new or if they are merely the consequences of priming. Priming refers to the process through which individuals become temporarily attuned to different considerations when answering questions, making decisions, or performing actions (Sherman et al., 1990). Priming occurs when a stimulus (like a survey question) briefly increases the salience of one consideration (such as the importance of academic performance when evaluating school quality) at the expense of other relevant considerations (such as the importance of students' social and emotional well-being). The effects of priming disappear quickly as the newly salient consideration wanes in prominence. To differentiate between learning and priming, previous studies examined whether the effects of information were larger for individuals who underestimated or overestimated the value in question—a pattern that would be more consistent with learning than with priming (Clinton & Grissom, 2015; Schueler & West, 2016). We employ the same approach in our analysis. We also test the priming hypothesis

directly by identifying the effects of status and/or growth information on the importance of academic performance relative to other educational objectives.

METHOD

Preregistration

This experiment has been preregistered on the American Economic Association's registry for randomized controlled trials. The research questions and the accompanying analyses presented here are consistent with the preanalysis plan posted on the registry.

Research Questions

We divide our research questions into two categories: primary and secondary. As the number of statistical tests necessary to answer these questions increases, so does the likelihood of false positives. The reader should place more confidence in the results of the analyses associated with the primary research questions. The results of the analyses associated with the secondary research questions should be viewed as exploratory.

Primary Research Questions

Research Question 1: To what extent are individuals able to estimate average achievement status and average achievement growth in their school districts?

Research Question 2: Does the provision of status and/or growth information affect the grades that participants assign to their local public schools?

Research Question 3: Does the provision of this information affect the importance of academic performance relative to other educational objectives?

Research Question 4: Do these effects vary by the academic performance of participants' districts?

Secondary Research Questions

Research Question 5: Do these effects vary by the racial/ethnic and economic compositions of participants' districts?

Research Question 6: Could these effects be the result of participants updating their prior beliefs about academic performance in their districts?

Data

We embedded an experiment in the 2019 *EducationNext* Poll, an annual survey of Americans' attitudes toward education issues. The survey was conducted from May 14 to May 25, 2019, by the polling firm Ipsos Public Affairs via its KnowledgePanel®. In the KnowledgePanel®, Ipsos Public Affairs maintains a nationally representative panel of more than 50,000 adults (obtained via address-based sampling techniques) who agree to participate in a limited number of online surveys, providing noninternet households with internet access and a device with which to participate. Ipsos then samples from this panel to obtain participants for particular surveys, such as the *EducationNext* Poll. This survey features a sample of 3,046 respondents, including a nationally representative, stratified sample of adults (age 18 and older) in the United States as well as representative oversamples of the following subgroups: teachers (667), African Americans (597), and Hispanics (648). Survey weights are employed to account for nonresponse and the oversampling of specific groups. Respondents could elect to complete the survey in English or Spanish.

Ipsos Public Affairs provided us with extensive demographic information for each participant: race/ethnicity, teacher status, parent status, Spanish language status, political party identification, political ideology, household income, U.S. Census region, age, educational attainment, gender, head of household status, housing type, marital status, and

employment status. In addition, Ipsos provided the census block identifier for each respondent. We used U.S. Census files linking block identifiers to school districts to match each respondent to his or her local school district. For participants living in areas with separate elementary and secondary districts, we link them to their elementary district. In all, our respondents reside in 1,893 school districts. Importantly, Ipsos provided census block identifiers for the total sample prior to fielding the survey, allowing us to incorporate locally tailored information about school districts in the experiment.

For measures of district-level average status, average growth, free and reduced-price lunch (FRPL) eligibility, and racial/ethnic composition, we use the Stanford Education Data Archive v2.1 (SEDA). SEDA contains data from state standardized tests in reading and math in Grades 3 to 8 administered from 2009 to 2015 for almost every school district in the United States. For each district, SEDA contains average status and growth in reading and math as well as the average across both subjects (we employ these combined values in our experiment). SEDA defines school districts in geographic terms. The dataset contains student performance data for all public schools located in the geographic boundaries of the district, including charter schools. The student test score data have been converted to a common scale that allows district-to-district comparisons across the country (Fahle et al., 2018).

SEDA's academic performance measures are derived from the U.S. Department of Education's ED*Facts* Data Initiative, which contains district-level achievement data by grade, year, and subject. The structure of the ED*Facts* data has an important drawback for the estimation of district growth. Ideally, growth measures the rate at which individual students' achievement improves over time. The aggregated nature of the ED*Facts* data allows only for the estimation of grade–year–subject cohort gains over time, which can be biased by within-cohort shifts in student demographics. However, comparisons of SEDA's district growth estimates and those generated by state longitudinal student data systems (which would be preferable but are neither widely available nor, in their raw form, directly comparable across states) show that the two are closely correlated (Reardon et al., 2019).

We use SEDA's empirical Bayes Grade Cohort Scale estimates for the measures of status and growth. To aid in the interpretability of these values for participants, we provide status and growth scores in terms of national percentiles. For example, we present growth information in the survey as follows: "The rate of growth in student academic performance in your school district is better than in [growth percentile] percent of districts and worse than in [100 – growth percentile] percent of districts" (see the following section for more details about the survey text). Prior research suggests that even minor differences in the presentation of school information (different phrasings, graphical representations, sequencing of information, etc.) can influence recipients' reactions and subsequent behavior (Glazerman et al., 2020). We readily acknowledge that our presentation of status and growth information is only one way that this content could be conveyed to the public. Additional research is warranted on the effects of different presentations of academic performance information.

Experimental Design

Participants are randomly assigned with equal probability to one of four experimental groups:

1.Participants in the *status group* receive their district's national percentile in terms of average achievement status.

2.Participants in the *growth group* receive their district's national percentile in terms of average achievement growth.

3.Participants in the *both group* receive both their district's national percentile in terms of average achievement status and their district's national percentile in terms of average achievement growth.

4.Participants in the *control group* do not receive academic performance information for their district.

At the beginning of the survey, all participants are asked to estimate how their local school district performs in terms of average achievement status. They receive the following prompt:

The next few questions are about the ***current level*** of student academic performance and the ***rate of growth*** or improvement in student academic performance in your school district from one year to the next.

Enter any number from 0 to 100.

I think the ***current level*** of student academic performance in my school district is better than **[number box, range 0–100]** percent of other districts in the United States.

Next, they estimate how their district performs in terms of average achievement growth:

Enter any number from 0 to 100.

I think the ***rate of growth*** in student academic performance in my school district is better than **[number box, range 0–100]** percent of other districts in the United States.

Depending on their experimental assignment, some participants receive information about their district's academic performance. Those assigned to the status group receive:

According to the most recent information available, the ***current level*** of student academic performance in your school district is better than in **[achievement percentile]** percent of districts and worse than in **[100 – achievement percentile]** percent of districts.

Those assigned to the growth group receive:

According to the most recent information available, the ***rate of growth*** in student academic performance in your school district is better than in **[growth percentile]** percent of districts and worse than in **[100 – growth percentile]** percent of districts.

Those assigned to the both group receive both pieces of information displayed above, while those assigned to the control group receive neither.

All participants then receive the following question about the quality of their local public schools:

Students are often given the grades A, B, C, D, and Fail to denote the quality of their work. Suppose the public schools themselves were graded in the same way. What grade would you give the public schools in your community? (Answer options: A, B, C, D, or Fail)

This question employs the standard wording for measuring confidence in the public schools as tracked by Loveless (1997) and Bali (2016).

Last, all participants receive the following question about the relative importance of student academic performance versus student social and emotional well-being (the sequence of "student academic performance" and "student social and emotional well-being" is randomized to eliminate ordering effects):

How much should schools focus on student academic performance versus student social and emotional well-being?

Please give a percentage for each. Your answers should add to 100%.

1. Student academic performance [number box, 0–100] %

2. Student social and emotional well-being [number box, 0–100] %

Total [show sum of boxes]

FINDINGS

Balance and Missing Data

Table 1 displays the frequencies of participants' demographic characteristics by experimental condition. Our use of random assignment establishes groups with similar demographic compositions. There are seven instances (out of 78 total comparisons) in which the demographic profile of an experimental group is statistically different from the control group. This rate is marginally higher than we would expect by chance alone. To adjust for these observable differences between groups, we include all individual-level covariates in subsequent analyses.

Table 1 Balance and Missing Data

%	Control (*n* = 724)	Status (*n* = 763)	Growth (*n* = 788)	Both (*n* = 771)
Female	48.81	52.94	50.94	53.32
White	63.31	65.91	63.03	63.06
Black	12.86	11.22	11.31	12.60
Hispanic	16.82	17.04	14.96	16.73
Other race	7.00	5.83	10.70*	7.60
Less than high school	10.71	12.04	8.15	11.51
High school	29.60	28.23	28.49	28.47
Some college	25.30	28.06	30.02*	29.16
College	34.39	31.67	33.34	30.87
Household income <US$25,000	13.25	13.99	14.74	15.71
Household income US$25,000–US$85,000	46.83	41.57*	41.08*	43.96
Household income >US$85,000	39.92	44.45	44.19	40.33
Took survey in Spanish	5.16	6.69	5.21	5.98

%	Control (*n* = 724)	Status (*n* = 763)	Growth (*n* = 788)	Both (*n* = 771)
Parent	28.90	28.72	34.40*	32.00
Teacher	3.10	2.78	2.93	2.51
Head of household	80.79	77.56	80.10	79.40
Owns home	70.02	71.77	71.54	69.09
Employed	66.89	61.98*	65.29	65.64
Married	56.52	54.66	58.89	61.09
Northeast	18.97	17.32	18.12	16.72
Midwest	18.93	20.05	24.39*	19.54
South	37.49	37.68	34.36	41.76
West	24.61	24.95	23.14	21.98
Age (years)	47.74	47.89	47.58	47.34
Party ID (1–7)	3.63	3.70	3.71	3.74
Ideology (1–7)	4.03	3.99	4.13	4.06
Missing outcomes	4.80	6.80	4.47	4.15
Missing covariates	0.85	1.43	1.56	1.98

Note. Status, Growth, and Both compared with Control; analyses incorporate survey weights.

*

$p < .05$.

OPEN IN VIEWER

Roughly, 4% to 7% of each group is missing answers to one or more of the survey questions that serve as outcomes in our study. If participants do not answer the district status estimation question, the district growth estimation question, the local public school grades question, or the relative importance of academic performance question, they are dropped from the analyses that rely on those values. About 1% to 2% of each group is missing one or more of the demographic covariates. If participants are missing demographic information, we recode the missing data with an arbitrary value and control for an indicator of missingness in subsequent analyses. Thirty-one participants (approximately 1% of the sample) live in areas where we do not have data on district status or growth. Depending on their experimental assignment, these participants are informed that their local schools perform at the 50th percentile in terms of status and/or growth.

Estimating Status and Growth

Our first research question asks about the extent to which participants are able to estimate status and growth in their districts. The first and second plots in Figure 1 display the distributions of participants' estimates of their district status and district growth percentiles versus the actual district status and district growth percentiles. Participants' estimates of status and growth percentiles range from 0 to 100. The modal estimate for both status and growth is the 50th percentile. For both forms of academic performance, there is also a second, smaller spike at the 75th percentile. Because the survey features a nationally representative sample, the distributions of actual status and growth percentiles are roughly uniform.

Figure 1. Estimating district status and district growth (n = 2,928).

Note. Estimates in scatterplots include random noise to differentiate points; lines represent bivariate linear regressions; analyses incorporate survey weights.

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Table 2 describes the distributions of estimated and actual academic performance in greater detail. The average estimated status percentile is 54.05 while the average actual status percentile is 48.46, suggesting that participants are somewhat overoptimistic about their districts' performance with respect to status. There is considerable variation in participants' responses. Their status estimates have a standard deviation of 24.97 percentile points (similar to the 29.22 percentile point standard deviation in actual status). Overall, participants' estimates of district status are related to and moderately predictive of actual district status. The correlation between the two is .29. This relationship is displayed visually in the third plot in Figure 1. In short, participants' estimates of achievement status reveal a modest understanding of how their districts perform in this regard.

Table 2 Estimating District Status and District Growth (*n* = 2,928)

Value	Mean	Standard Deviation	Correlation
Estimated status	54.05*	24.97	
Actual status	48.46*	29.22	
Estimated S − Actual S	5.57*	32.52	

Value	Mean	Standard Deviation	Correlation
Estimated growth	48.66*	25.77	
Actual growth	49.10	26.59	
Estimated G − Actual G	−0.57	35.95	
Estimated S and Actual S			.29*
Estimated G and Actual G			.06*
Estimated S and Estimated G			.79*
Actual S and Actual G			.32*

Note. Estimated Status, Actual Status, Estimated Growth, and Actual Growth compared with 50th percentile; analyses incorporate survey weights.

*

$p < .05$.

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The pattern with respect to growth is quite different. While the average estimated growth percentile (48.66) and the average actual growth percentile (49.10) are close, this is the product of participants underestimating and overestimating growth in roughly equal proportion. The correlation between the two is .06—essentially a precisely estimated zero. This relationship is displayed visually in the fourth plot in Figure 1. While participants demonstrate some understanding of their districts' performance in terms of achievement status, they are largely unaware of how their districts perform in terms of achievement growth.

We also explore the extent to which district status and growth—both actual and estimated—are related (see the fifth and sixth plots in Figure 1). Among the participants in our sample, actual status and actual growth are correlated at .32. On average, higher status districts are also higher growth districts, but the relationship is modest. Estimated status and estimated growth, on the contrary, are correlated at a much stronger .79. This mismatch lends itself to two different interpretations. Perhaps participants understand the distinction between status and growth, but they incorrectly believe that a district that is strong on one dimension of academic performance is also overwhelmingly likely to be strong on the other. Alternatively, it is possible that participants simply do not distinguish between the two concepts. They may incorrectly view status and growth as different ways of measuring the same underlying construct. Our analysis is unable to adjudicate between these two possibilities.

The Effects of Academic Performance Information

Table 3 displays the results of the analyses associated with Research Questions 2 to 4, in which we estimate the effects of providing academic performance information on (a) the grades that participants assign to their local public schools and (b) participants' preferences about how much schools should focus on academic performance.[3] Model 1

displays the average effects of providing information about status, growth, or both on participants' local school grades. Participants in the control group give an average grade of 3.64 on a 5-point scale (roughly a B-) with a standard deviation of 0.91 points. For every experimental group, the receipt of academic performance information is a sobering experience. Compared with the grades in the control group, the grades in the status and growth groups decline on average by 0.28 points and 0.29 points, respectively. The grades in the both group decline by 0.18 points on average. When considering the sample as a whole, the provision of academic performance information of any kind reduces the grades that participants give to their local public schools.

Table 3 The Effects of Status and/or Growth Information

	Local school grades (1–5)				Importance of academic performance (0–100)			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Status	−0.28* (0.05)		−0.22* (0.09)	−0.30* (0.10)	−2.13* (0.94)		−1.87 (1.83)	−6.21* (1.97)
Growth	−0.29* (0.05)	0.00 (0.05)	−0.03 (0.09)	−0.57* (0.10)	−1.06 (0.94)	1.06 (0.91)	−4.28* (1.81)	−5.61* (1.99)
Both	−0.18* (0.05)	0.10* (0.05)	−0.28* (0.09)	−0.49* (0.11)	−0.60 (0.94)	1.52 (0.91)	−1.03 (1.84)	−6.07* (2.01)
Control		0.28* (0.05)				2.13* (0.94)		
Z			0.14* (0.01)	0.04* (0.01)			−0.09 (0.24)	−0.64* (0.27)
Z × S			−0.01 (0.02)	0.00 (0.02)			−0.05 (0.32)	0.83* (0.35)
Z × G			−0.05* (0.02)	0.06* (0.02)			0.67* (0.32)	0.92* (0.36)
Z × B			0.02 (0.02)	0.06* (0.02)			0.09 (0.32)	1.11* (0.36)
Z =			S Percentile (10s)	G Percentile (10s)			S Percentile (10s)	G Percentile (10s)
Observations	3,012	3,012	3,012	3,012	3,045	3,045	3,045	3,045

Note. Values are WLS coefficients (standard errors in parentheses); analyses incorporate survey weights and include all individual-level covariates. WLS = weighted least squares.

*

$p < .05$.

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A more complex story emerges when we consider how the effects of academic performance information vary by participants' local context. Figure 2 displays the relationships between actual district performance and participants' evaluations of their local public schools, disaggregated by experimental condition (equivalent to Models 3 and 4 in Table 3). The first three plots compare the control group with each of the other experimental groups at every point in the district status distribution. Participants in higher status districts tend to give higher grades, regardless of their experimental assignment. The provision of status information tends to reduce these grades at all points in the district status distribution, but the relationship between district status and participants' perceptions of school quality is generally unaffected. The provision of both status and growth information generates similar results. By contrast, the provision of growth information alone weakens the relationship between district status and perceptions of school quality. For every 10-percentile-point increase in district status, the grades in the growth group decrease by an additional 0.05 points relative to the control group. In higher status districts (not all of which are also higher growth districts), the negative effect of receiving growth information is large: about half a letter grade on average. In lower status districts (some of which are relatively higher growth districts), there is no effect. This is consistent with the greater responsiveness to negative information identified by James and Moseley (2014). Satisfaction tends to decline with the receipt of bad performance information, but there is no analogous positive effect of good performance information. This pattern of results suggests that participants in the growth group incorporate the new information into their evaluations in ways that temper the conventional wisdom that higher status districts are therefore higher quality districts.

Figure 2. Local school grades by district status and district growth.

Note. Lines represent results from Models 3 to 4 in Table 3; analyses incorporate survey weights and include all individual-level covariates; shaded areas represent 95% confidence intervals.

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The fourth, fifth, and sixth plots in Figure 2 compare the control group with each of the other experimental groups at every point in the district growth distribution. In the control group, there is a weak positive relationship between district growth and participants' grades, indicating that these evaluations only loosely reflect the variation in district growth. Given participants' unfamiliarity with growth, the presence of any relationship between district growth and perceptions of school quality is likely due to the fact that district growth is also correlated with district status (when regressing grades on both status and growth among participants in the control group, only the relationship between status and grades is significant). The provision of growth information—alone or in combination with status information—strengthens the relationship between district growth and participants' grades considerably. For every 10-percentile-point increase in district growth, the grades in the growth group and the both group increase by an additional 0.06 points relative to the control group. In line with the expectation that negative news carries more weight, the provision of growth information produces downward effects on perceptions of school quality for participants living in lower growth districts and no effects for participants living in higher growth districts. This pattern of results is also consistent with the finding that participants know less about their districts' performance in terms of growth than in terms of status. As a result, the effects of growth information vary based on the news—positive or negative—that it contains.

We also explore whether the provision of status and/or growth information affects participants' views about how much schools should focus on academic performance relative to other educational objectives (in this case: students' social and emotional well-being). Model 5 of Table 3 displays the average effects for the status group, the growth group, and the both group. On average, participants in the control group suggest that schools should place about 65% of their focus on academic performance with a standard deviation of about 19 percentage points. Receiving status information reduces the relative importance of academic performance by 2.13 percentage points. Participants in the growth group and the both group also say that schools should focus less on academic outcomes than their peers in the control group, but these differences are not statistically significant.

Figure 3 displays the relationships between actual district performance and participants' attitudes about how much schools should focus on academic outcomes, disaggregated by experimental condition (equivalent to Models 7 and 8 in Table 3). The first three plots compare the control group with each of the other experimental groups at every point in the district status distribution. In the control group, there is no relationship between district status and participants' educational priorities. Participants in both lower status and higher status districts come to the same general conclusion: Schools ought to spend about two thirds of their time and resources on academic matters. The provision of status information—alone or in combination with growth information—tends to reduce participants' emphasis on academic performance slightly, but the negative effect is constant across the entire district status distribution. However, the effect of growth information alone varies by district status. For every 10-percentile-point increase in district status, the importance of academic performance in the growth group increases by an additional 0.67 percentage points relative to the control group. In lower status districts, the provision of growth information (which may contain unexpected "good news" for some) prompts participants to indicate that schools could focus a little less on academic outcomes. Meanwhile, in higher status districts, the provision of growth information (which may contain unexpected "bad news" for some) shifts the importance of academic performance upward.

Figure 3. The relative importance of academic performance by district status and district growth.

Note. Lines represent results from Models 3 to 4 in Table 3; analyses incorporate survey weights and include all individual-level covariates; shaded areas represent 95% confidence intervals.

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The fourth, fifth, and sixth plots in Figure 3 compare the control group with each of the other experimental groups at every point in the district growth distribution. In the control group, there is a clear negative relationship between district growth and participants' educational priorities. These attitudes are remarkably intuitive considering the absence of growth information. Participants in lower growth districts want schools to focus more on students' academic development, while their peers in higher growth districts suggest that schools should focus a little more on students' social and emotional well-being. The provision of academic performance information of any kind appears to reverse this relationship. For every 10-percentile-point increase in district growth, the importance of academic performance increases by an additional 0.83 percentage points (the status group), 0.92 percentage points (the growth group), and 1.11 percentage points (the both group), relative to the control group. Among those in lower growth districts, the provision of academic performance information—either status, growth, or both—causes participants to assign less importance to students' academic development. The reverse is true in higher growth districts. Our research design does not offer insight into the mechanism for these somewhat counterintuitive results. It may be the case that participants in lower growth districts are more skeptical of the measures of academic performance provided by our experiment, and they respond by placing relatively more emphasis on students' social and emotional well-being.

Heterogeneous Effects by District Racial/Ethnic and Economic Composition

Next, we present the results of the analyses associated with our secondary research questions. Given the increasing number of statistical tests that accompany each additional research question, the reader should view the following results as exploratory.

The first of our two secondary research questions asks whether the effects described above vary by the racial/ethnic and economic composition of participants' districts. This question is based on the premise that district-level student racial/ethnic composition and district-level student economic composition have different underlying relationships with average status and average growth. Figure 4 displays these relationships for the participants in our sample. There is a strong, positive relationship between the percentage of White students and the district status percentile (r = .62). The analogous relationship is much weaker with respect to the district growth percentile (r = .18). Similarly,

the relationship between the percentage of FRPL-eligible students and the district status percentile (r = −.87) is much stronger than the analogous relationship with the district growth percentile (r = −.35). Based on the differences in these underlying relationships, we speculated that the effects of the provision of academic performance information might vary for participants living in districts with different racial/ethnic and economic compositions.

Figure 4. District status, growth, and demographics (n = 3,037).

Note. Points represent participants' local school districts; lines represent bivariate linear regressions; analyses incorporate survey weights.

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Models 1 and 2 of Table 4 display the effects of academic performance information on local school grades as they vary by the percentage of White students and the percentage of FRPL-eligible students in participants' districts. We do not observe evidence of treatment effect heterogeneity by the percentage of White students. However, the effects of growth information vary by the percentage of FRPL-eligible students. In the control group, the relationship between the percentage of FRPL-eligible students and perceptions of school quality is sharply negative: Participants in less affluent district tend to give lower grades to their local schools. In the growth group, this relationship is weakened. For every 10-percentage-point increase in FRPL-eligible students, the grades in the growth group increased by an additional 0.06 points relative to the control group. In short, upon receiving growth information, participants' perceptions of school quality are less likely to be a simple function of the affluence of a community.

Table 4 Heterogeneous Treatment Effects

	Local school grades (1–5)				Importance of academic performance (0–100)			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Status	−0.27* (0.10)	−0.45* (0.12)	−0.29* (0.05)	−0.28* (0.05)	−3.27 (1.92)	−1.72 (2.39)	−1.38 (0.93)	−1.14 (0.92)
Growth	−0.12 (0.10)	−0.58* (0.12)	−0.30* (0.05)	−0.30* (0.05)	−6.77* (1.89)	4.23 (2.38)	−0.40 (0.93)	−0.66 (0.91)
Both	−0.12 (0.10)	−0.13 (0.12)	−0.16* (0.05)	−0.18* (0.05)	−1.28 (1.91)	0.83 (2.39)	−0.46 (0.93)	−0.54 (0.91)
Z	0.09* (0.01)	−0.19* (0.02)	0.02 (0.01)	0.07* (0.01)	−0.52* (0.24)	0.28 (0.33)	0.23 (0.21)	0.46* (0.19)
Z × S	0.00 (0.02)	0.03 (0.02)	0.01 (0.02)	0.00 (0.01)	0.24 (0.32)	−0.05 (0.44)	0.04 (0.28)	−0.41 (0.25)

	Local school grades (1–5)				Importance of academic performance (0–100)			
	1	2	3	4	5	6	7	8
Z × G	−0.03 (0.02)	0.06* (0.02)	0.01 (0.02)	−0.05* (0.01)	1.06* (0.31)	−1.03* (0.43)	−0.53 (0.29)	−0.47 (0.26)
Z × B	−0.01 (0.02)	−0.01 (0.02)	−0.04* (0.02)	−0.04* (0.01)	0.14 (0.31)	−0.28 (0.44)	−0.02 (0.29)	−0.75* (0.25)
Z =	% White (10s)	% FRPL (10s)	Est. S – Act. S (10s)	Est. G – Act. G (10s)	% White (10s)	% FRPL (10s)	Est. S – Act. S (10s)	Est. G – Act. G (10s)
Observations	3,003	3,003	2,934	2,931	3,036	3,036	2,943	2,939

Note. Values are WLS coefficients (standard errors in parentheses); analyses incorporate survey weights and include all individual-level covariates. FRPL = free and reduced-price lunch; WLS = weighted least squares.

*

$p < .05$.

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Models 5 and 6 of Table 4 display the effects of status and/or growth information on the relative importance of academic performance as they vary by the percentage of White students and the percentage of FRPL-eligible students in participants' districts. In the control group, the relationship between the percentage of White students and the relative importance of academic performance is negative, and the analogous relationship with the percentage of FRPL-eligible students is positive. In other words, participants in Whiter and more affluent districts tend to say that schools should focus a little less on academic outcomes and a little more on students' social and emotional well-being than their peers in districts that serve more low-income students and students of color. The provision of growth information reverses these relationships. For every 10-percentage-point increase in the percentage of White students, the importance of academic performance in the growth group increases by an additional 1.06 percentage points relative to the control group. For every 10-percentage-point increase in FRPL-eligible students, the importance of academic performance in the growth group decreases by an additional 1.03 percentage points relative to the control group. The provision of growth information tends to prompt participants in richer, Whiter districts to place more emphasis on students' academic development. At the same time, the provision of growth information prompts participants in less affluent, more diverse districts to place more emphasis on students' social and emotional well-being.

Updating Prior Beliefs About Academic Performance

The final research question asks whether these effects could be the result of participants updating their prior beliefs about academic performance in their districts. To answer this question, we test whether the effects vary by the extent to which participants incorrectly estimate academic performance in their districts. Model 3 of Table 4 displays the effects of academic performance information on local school grades as they vary by the amount that participants overestimate their districts' status percentiles. The only evidence for differential updating with respect to status appears among participants in the both group. For every 10-percentile-point overestimation of district status, the grades in the both group decrease by an additional 0.04 points relative to the control group. The evidence for differential updating with respect to growth—about which participants' prior beliefs are less well informed—is more

robust. Model 4 displays the effects of academic performance information on local school grades as they vary by the amount that participants overestimate their districts' growth percentiles. For every 10-percentile-point overestimation of district growth, the grades in the growth group and the both group decrease by an additional 0.05 points and 0.04 points relative to the control group, respectively. In short, as the overestimation of district growth increases, so does the negative effect of growth information on local school grades.

Model 7 of Table 4 displays the effects of status and/or growth information on the relative importance of academic performance as they vary by the amount that participants overestimate their districts' status percentiles. We do not observe evidence of treatment effect heterogeneity along this dimension. Alternatively, Model 8 indicates that, for every 10-percentile-point overestimation of district growth, the importance of academic performance in the both group decreases by an additional 0.75 percentage points relative to the control group. In other words, as the overestimation of district growth increases, so does the negative effect of receiving both forms of academic performance information on the importance that they assign to students' academic development.

CONCLUSION

States increasingly include measures of both achievement status and achievement growth in their school accountability systems. States and school districts use this information to guide their efforts to support struggling students, redirect resources where they are most needed, and even shut down chronically underperforming schools. Families also use this information—either via states' official school report cards or via secondary sources, such as GreatSchools.org or Niche.com, that draw on state data—as they make school and housing decisions.

Previous scholarship suggests that the American public already possesses a modest understanding of how their local schools perform in terms of achievement status. We observe the same pattern in our own analysis. However, we also find that Americans are largely unfamiliar with how their local schools perform in terms of growth. This should not be altogether surprising, given the fact that many states have only recently incorporated growth data into their school accountability systems. To understand how the public responds to these new measures of educational performance, we conducted an online survey experiment with a nationally representative sample that identifies the effects of disseminating status and/or growth information on participants' perceptions of school quality.

Because of Americans' existing familiarity with achievement status in their local schools, the provision of status information does not fundamentally change the underlying relationship between district status and the public's perceptions of school quality. The provision of growth information, however, alters Americans' views about educational performance. The effects of growth information are quite different for participants living in lower growth districts (significantly reducing the grades that participants assign to their local schools) and higher growth districts (no effect). Consequently, the provision of growth information strengthens the underlying relationship between district growth and the public's perceptions of school quality. In short, when participants learn about student growth, their personal evaluations of their local schools become more in line with a measure that many researchers consider a better measure of schools' contributions to student learning. Moreover, because district growth bears a weaker relationship to the economic composition of the student body than district status, the provision of growth information reorients Americans' perceptions of school quality away from the conventional wisdom that more affluent school districts are almost always higher quality districts.

This pattern of results does not necessarily imply that the provision of growth information improves participants' conceptual understanding of the causal effects of schools on student learning. We did not ask participants to describe what status and growth meant to them, nor did we ask participants to explain how they arrived at their appraisals of their local public schools. Our results indicate that participants who receive growth information placed at least some weight on it when evaluating school quality, but we cannot ascertain whether it changed their beliefs about the validity of growth as a measure of school effectiveness.

The increasing prevalence of student growth information may have some unanticipated consequences. We also asked participants to opine on how much schools should focus on academic performance relative to other educational objectives (in this case, students' social and emotional well-being). We find that the provision of growth information to participants living in lower growth districts not only lowers their perceptions of school quality, it also causes them to say that their schools should focus less on academic outcomes. It may be the case that distributing information about lackluster student growth will not, as one might expect, induce a call-to-arms for a greater emphasis on academic goals. Rather, it may end up reducing support for schools' academic objectives and/or this particular method of measuring success toward those objectives.

These results have important implications for our understanding of the social, economic, and political consequences of how we measure educational performance. While the vast majority of states now include or plan to include growth in their school accountability systems, there is a great deal of variation in their approaches to measuring growth, the weight they assign to it in school and district ratings, and the accessibility of this information to the public. The results of our analysis help us think through some of the potential consequences of these policy choices. As states begin to rely less on traditional indicators of achievement status when evaluating school quality, we might expect to see heightened demand for higher growth schools and nearby housing. Because average growth bears a weaker relationship to student demographics than average status, this shift could alternatively benefit many low-income communities and communities of color (by increasing housing values for existing homeowners) or further disadvantage them (by attracting relatively affluent newcomers who can afford higher housing costs). With metrics that better reflect schools' contributions to student learning—and not merely the characteristics of the students they serve—districts and states may be able to allocate resources more efficiently and offer more targeted interventions to underperforming schools. We might also expect to see political advantages accrue to school board members and other elected officials who preside over periods of high growth.

The COVID-19 pandemic and subsequent school closures have created new complications for the measurement of academic performance. Annual, standardized tests are necessary to calculate both status and growth for students, schools, and districts. In Spring 2020, the U.S. Department of Education allowed states to forgo testing elementary and secondary students for a year, and, at the time of writing, discussions are underway to determine whether to reinstate these tests in 2021 (Gewertz, 2020; Strauss, 2020). Some researchers suggest that it may be possible to skip a year of testing and calculate student-level growth over a 2-year period (Betebenner & Van Iwaarden, 2020; Fazlul et al., 2021). If 2 years without testing elapse, this approach becomes less tenable. Even if testing resumes in Spring and/or Fall 2021, estimates of either status or growth derived from these data may not be directly comparable with previous years. During such a crisis, the composition of test-takers can change in unpredictable ways, and the students who are present on test day may face atypical physical, psychological, and environmental obstacles that can introduce additional noise into the data (Klugman & Ho, 2020). Both educators and the public should apply caution when making decisions based on estimates of academic performance using data collected during the pandemic.

We see a variety of important avenues for future research stemming from this work. First, our estimates of average district status and average district growth obscure considerable variation in both measures. It may be the case that individuals are particularly sensitive to information about the status and growth of local students who share their racial, ethnic, and/or socioeconomic identity. Moreover, evidence of large status-based or growth-based inequalities between students—or the lack thereof—may have a significant influence on perceptions of school quality. Similar survey-based information experiments with more fine-grained treatments could help illuminate this issue.

Additional research is also necessary to understand the extent to which individuals comprehend and trust new measures of academic performance such as growth. We examine the effects of distributing status and growth information on perceptions of school quality, but our analysis does not capture the nuances of how participants make sense of these data. Some participants may view growth as a superior measure of schools' contributions to student learning, but they may also consider status to be an important element of school quality (e.g., the value of high-performing peers). Other participants may have little interest in the underlying constructs that either metric attempts

to measure, but care deeply about their districts' rankings. Still others may be skeptical of any metric derived from standardized test scores. Both quantitative and qualitative research approaches would be valuable in mapping out the public's reactions to academic performance information and to identify potential barriers to understanding.

Finally, the variation in states' school accountability systems offers an opportunity to study how these policy choices may affect behavioral outcomes such as families' school enrollment decisions, housing prices, and political outcomes in school board elections and local school funding referenda. The staggered rollout of growth measures—both in official state data portals and via popular school rating websites—may make it possible for researchers to identify the effects of disseminating this information. Our analysis suggests that these policy choices can alter the public's attitudes toward the public schools, but much work remains to be done to understand whether these revised attitudes translate into different behaviors.

DECLARATION OF CONFLICTING INTERESTS

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FOOTNOTES

1. Our primary analyses focuses on all U.S. adults—rather than the subset of U.S. adults who are parents/caretakers of school-age children—because of the relevance of local school quality to outcomes that affect the public as a whole.

GO TO FOOTNOTE

2. We use linear regression for ease of interpretation but acknowledge that local school grades (A–F) may violate the assumption that outcome variables contain equidistant intervals. Appendix Table A1 in the online version of the journal displays ordered logistic regression results for all analyses with local school grades as the outcome. These results are substantively similar to the results discussed in the main text.

GO TO FOOTNOTE

3. Appendix Table A2 in the online version of the journal presents results for these same research questions with the sample limited to parents of school-age children. These results are generally similar to those based on the full sample, though we lack sufficient statistical power to make strong claims.

GO TO FOOTNOTE

REPORT FOOTNOTE SEVENTEEN;

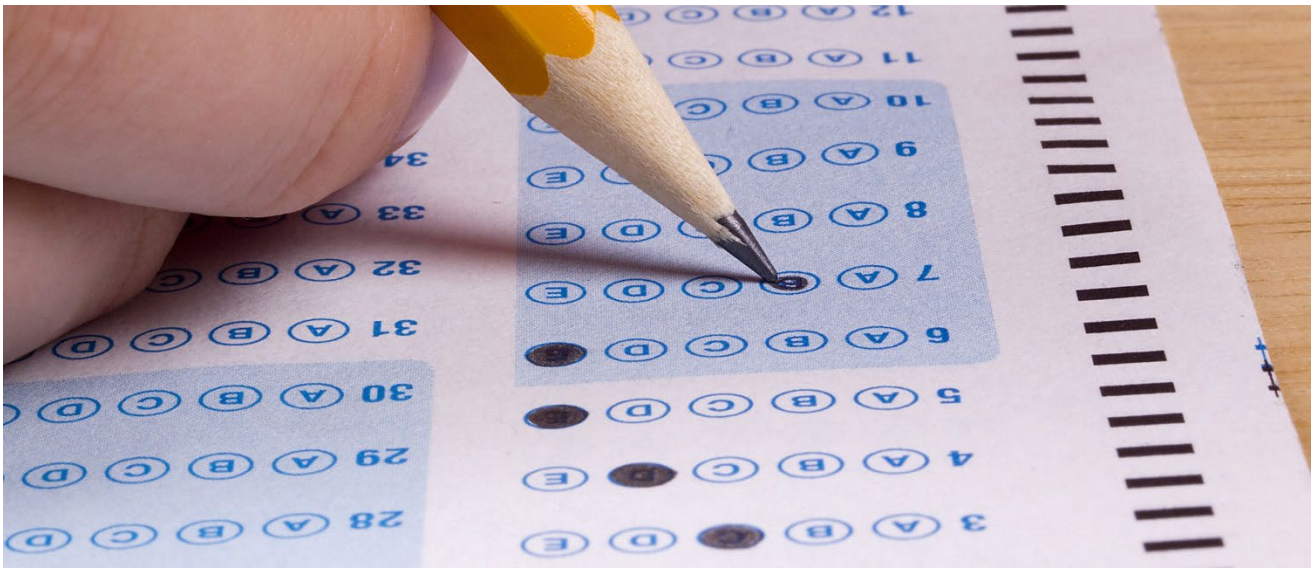
Citation: https://www.urban.org/urban-wire/why-proficiency-versus-growth-debate-matters-assessing-school-performance. Accessed, June 21, 2023.

Why the proficiency-versus-growth debate matters for assessing school performance

Matthew Chingos

Display Date

January 18, 2017



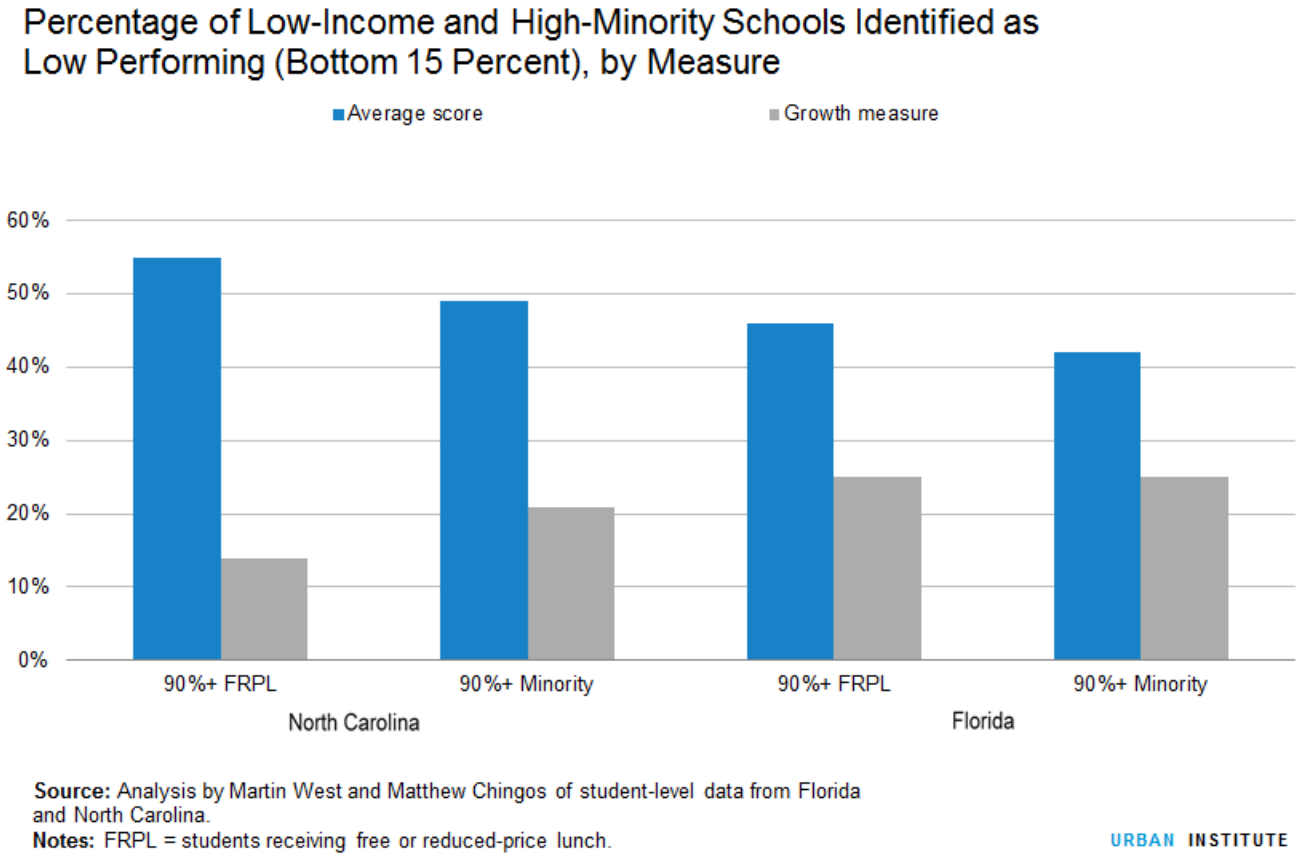
Secretary of Education nominee Betsy DeVos and Minnesota Senator Al Franken sparred at Tuesday's confirmation hearing over whether student performance is best measured by proficiency or growth. How this question is resolved over the next year will have enormous consequences for which schools are identified as low performers in need of intervention.

The question highlighted by Senator Franken is whether schools should be judged by how well their students perform on state tests—often relative to an arbitrary "proficiency" threshold—or by the average growth students make from one year to the next. Senator Franken made the case for growth, arguing that a metric of proficiency encourages teachers to ignore those students likely to fall far below or above the threshold.

But the problems with using proficiency to assess school performance go beyond those created by an arbitrary threshold. Measuring average student performance reflects not only how much students are learning at school but also the knowledge they brought when they enrolled. Growth measures go a long way toward correcting for that by examining the progress students make while enrolled at a given school.

This debate is not just theoretical; it makes an enormous difference in practice because of how prominently test scores factor in how states identify failing schools. Because of the well-documented correlation between test scores and students' socioeconomic status and race, judging schools based on their average test scores will tend to penalize schools that serve large numbers of lower-income and racial minority students, even if those schools produce significant student growth on math and reading tests.

Using student-level data from two states, Harvard Professor Martin West and I found that 40 to 60 percent of schools serving mostly low-income or underrepresented minority students would fall into the bottom 15 percent of schools statewide based on their average test scores, but only 15 to 25 percent of these same schools would be classified as low performing based on their test-score growth.



Leaning too heavily on proficiency rates or average test scores can unfairly target schools, especially those that serve disadvantaged students, for intervention, while ignoring schools where students are learning the least. The consequences can be significant: schools identified as persistently low performing can be taken over by the state, forced to fire their principal, or turned into a charter school.

When the federal government first required states to administer annual math and reading tests as part of the No Child Left Behind Act (NCLB), it was not possible to calculate growth measures in all states. But NCLB, by requiring regular tests, soon made such progress-based measures feasible.

The Every Student Succeeds Act, NCLB's successor, provides states with much greater discretion in how they measure school performance, including in the relative importance assigned to proficiency versus growth measures. The evidence makes clear that growth measures should receive significant weight if schools are to be judged based on how well they serve students rather than on which students they serve.

REPORT FOOTNOTE EIGHTEEN;

Citation: https://blueprint.marylandpublicschools.org/expert-review-team/. Accessed, June 21, 2023.

Expert Review Team

The Maryland State Department of Education is launching a comprehensive school review process to support the implementation of the Blueprint for Maryland's Future at schools and districts across the state. The Expert Review Team will support the implementation of the Blueprint through collaboration with districts to ensure all schools are on a path towards improving student outcomes.

The Expert Review Team will conduct school visits to support school and district leaders in assessing the effectiveness of curriculum, instruction, interventions, and behavioral health services designed to improve student learning and well-being. Effective practices and areas of growth will be identified and shared with other schools and support will be provided for improvement.

The pilot Expert Review Team process began in 2022, enabling refinement of the school review process through stakeholder engagement. School reviews are conducted by an Expert Review team consisting of experienced educators, leaders, and other experts with in-depth knowledge of effective school improvement practices and services that enhance the student's ability to be successful.

WHAT IS THE PROCESS?

The team of expert educators will visit schools to observe classrooms, conduct interviews and focus groups, and use

additional data to analyze the extent to which the Blueprint for Maryland's Future initiatives are being carried out and to identify instructional best practices.

Reviewers will collaborate with school-based faculty and local education agency staff to develop recommendations, measures, and strategies to address growth areas identified by the Expert Review Team.

WE ARE BUILDING OUR MARYLAND EXPERT REVIEW TEAM. THE APPLICATION WINDOW HAS BEEN REOPENED!

As we continue to lead the Blueprint for Marylands Future, the Maryland State Department of Education is seeking education professionals to join our Expert Review Team. Consisting of teachers, school leaders, and relevant experts, the Expert Review Team will be responsible for visiting assigned schools within Maryland's 24 local education agencies to facilitate on-site reviews, focus groups, and complete pre-visit data reviews and post-visit reporting.

- APPLY NOW

IMPORTANT RESOURCES

- VIEW THE ERT FLYER
- VIEW ALL FAQS ABOUT THE ERT PROGRAM
- VIEW THE PRESENTATION TO AIB ON THE EXPERT REVIEW TEAM

Classroom Review

Classroom reviews are conducted to capture a holistic view of teaching and learning within the school. This approach allows for the review of instructional strategies and interventions used to support student growth.

Interviews and Focus Groups

In-depth conversations through focus groups and interviews are essential components of the review process. They provide the opportunity for stakeholders to share their ideas and experiences in the school regarding the support provided to foster student achievement and social and emotional well-being.

Impact on Schools

The Expert Review Team program provides opportunities for educational experts to assist schools to improve the implementation of Blueprint initiatives with a focus on student outcomes and developing recommendations to enhance student success.

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