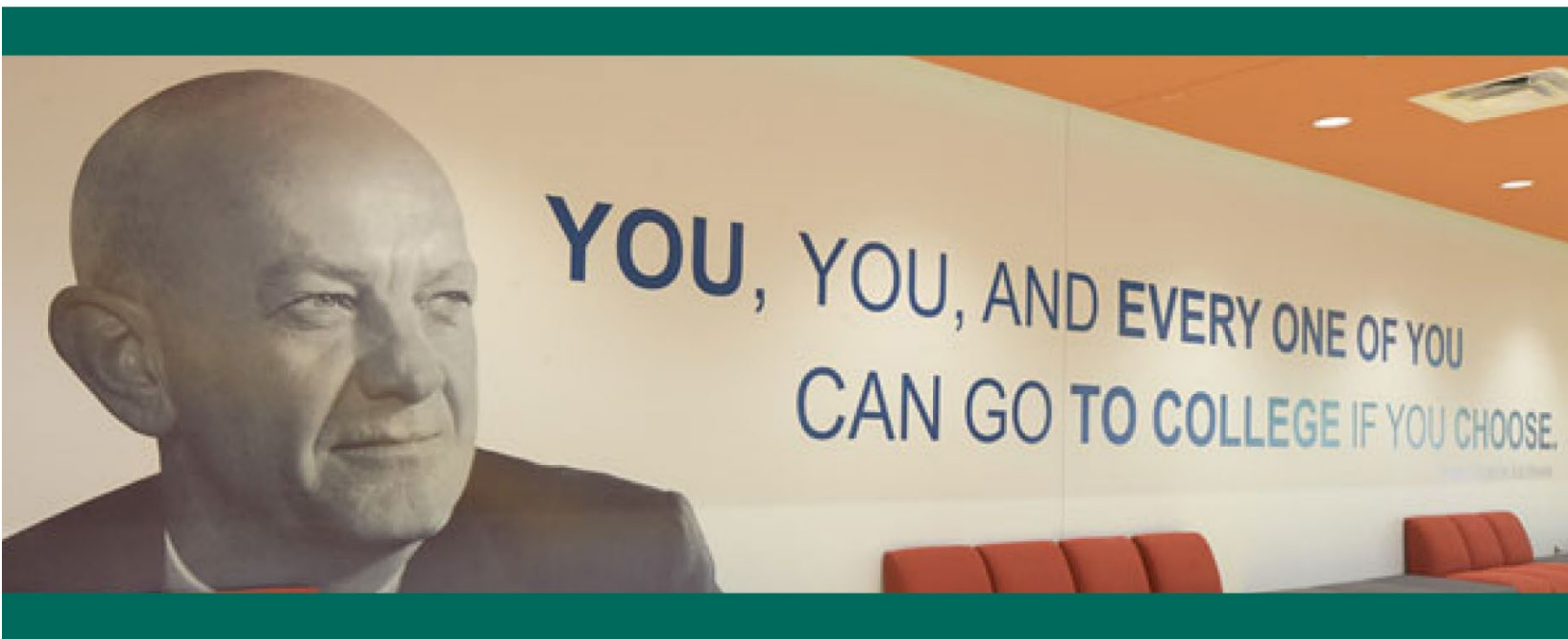


Ewing Marion Kauffman School

Year 10 and 11 Impacts

April 2024



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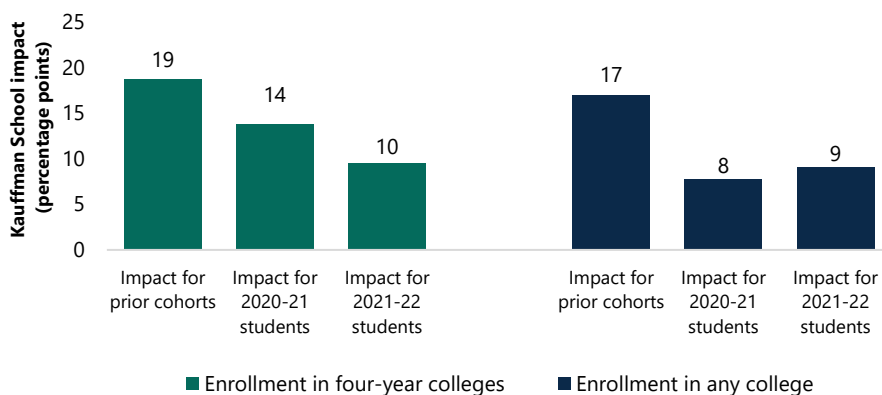
Ewing Marion Kauffman School Year 10 and 11 Impacts



Key Findings

The Kauffman School has a substantial positive impact on enrollment in four-year colleges. The Kauffman School had a positive impact on enrollment in four-year colleges for its third and fourth cohorts of students. Kauffman students in the graduating class of 2020-21 were 14 percentage points more likely to enroll in a four-year college, and Kauffman students in the graduating class of 2021-22 were 10 percentage points more likely to enroll in a four-year college than if they had attended another Kansas City public district or charter school (Figure ES.1). Although impacts on enrollment in both four-year colleges and any college were smaller in the most recent two years compared to prior years, the Kauffman School’s impact on students’ college outcomes continues to be substantial; the 10-percentage point impact on enrollment in four-year colleges in 2021-22 is large enough to close over 80 percent of the gap in rates of enrollment in four-year colleges for Black high school seniors in Missouri.

Figure ES.1. The Kauffman School has a substantial positive impact on enrollment in four-year colleges



Compared to previous years, the Kauffman School’s cumulative impact on student achievement growth through 2020-21 was substantially smaller and indistinguishable from comparison schools in most grades and subjects. Kauffman students spent most of 2020-21 learning remotely. Research has shown that the COVID-19 pandemic reduced student achievement, and students who attended school remotely performed worse than students who attended in person, both nationally and in Missouri (Goldhaber et al. 2022; Halloran et al. 2021; Kuhfeld et al. 2020; Missouri DESE 2021b).

Given that both Kauffman students and comparison students in Kansas City spent most of the 2020-21 school year learning remotely, the lower impacts in that year might indicate that students at the Kauffman School struggled more with remote learning than did students in Kansas City public district or charter schools.

After full-year in-person learning resumed in 2021-22, achievement impacts were again positive and statistically significant in most grades and subjects. We compared the impacts on English language arts (ELA) achievement for 2020-21 students and 2021-22 students to the impacts averaged across prior years (through 2018-19, because tests were canceled in 2019-20 due to the COVID-19 pandemic) (Figure ES.2).

The figure shows the impacts for Kauffman students relative to comparison students in Kansas City district and charter schools, measured in years of learning growth.

Evaluation notes

The Kauffman School is a public, tuition-free charter school serving Kansas City students. In the 2021-22 school year, the school enrolled 1,089 students in grades 5 through 12. Most (82 percent) of the students are eligible for free or reduced-price lunch, and 91 percent were Black or Hispanic. This report discusses the impact of the Kauffman School on college enrollment, high school graduation, achievement, attendance, and suspensions.

Data

Data are from the Missouri Department of Elementary and Secondary Education (DESE) and the Kauffman School. The data include college enrollment and high school graduation outcomes, information on attendance and suspensions, demographic characteristics of the students, and scores on the Missouri Assessment Program and the ACT.

Methods

To measure the impact of the Kauffman School on its students, we identified a group of students in other Kansas City district and charter schools who had similar demographic characteristics and achievement during 3rd and 4th grades. We compared outcomes for those students to the outcomes of Kauffman students in 5th grade through high school graduation and enrollment in college.

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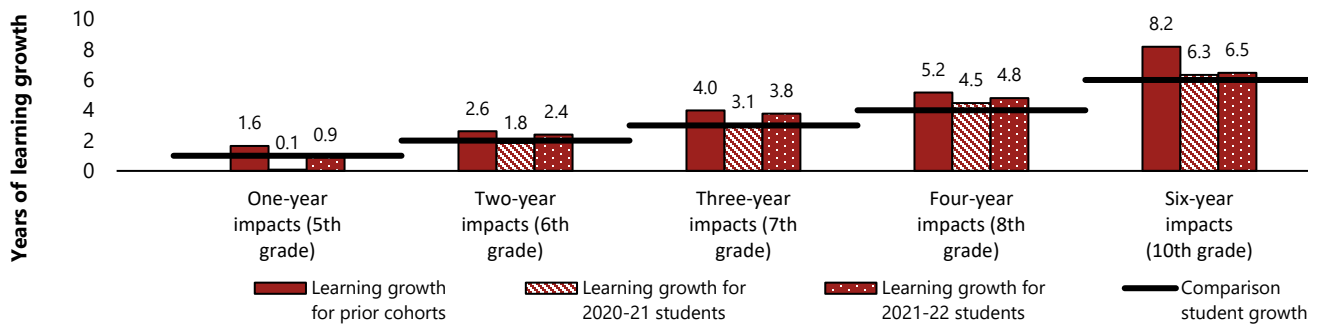


Mathematica

Comparison students are assumed to achieve one year of learning growth per school year, as indicated by the black horizontal lines. The impacts of the Kauffman School are represented by the differences between the height of the bars and the black horizontal lines.

The Kauffman School experienced statistically significant declines in ELA impacts in all grades between 2020-21 and prior years. In 2020-21, learning growth in the Kauffman School was lower than in comparison schools in 5th-grade ELA, and growth was indistinguishable from comparison schools in other grades. Achievement impacts improved across all grades in 2021-22, though in most cases the impacts did not return to pre-pandemic levels. The patterns of results were similar for mathematics and science (results shown in full report).

Figure ES.2. The Kauffman School’s impact on ELA achievement declined in 2020-21 and improved in 2021-22

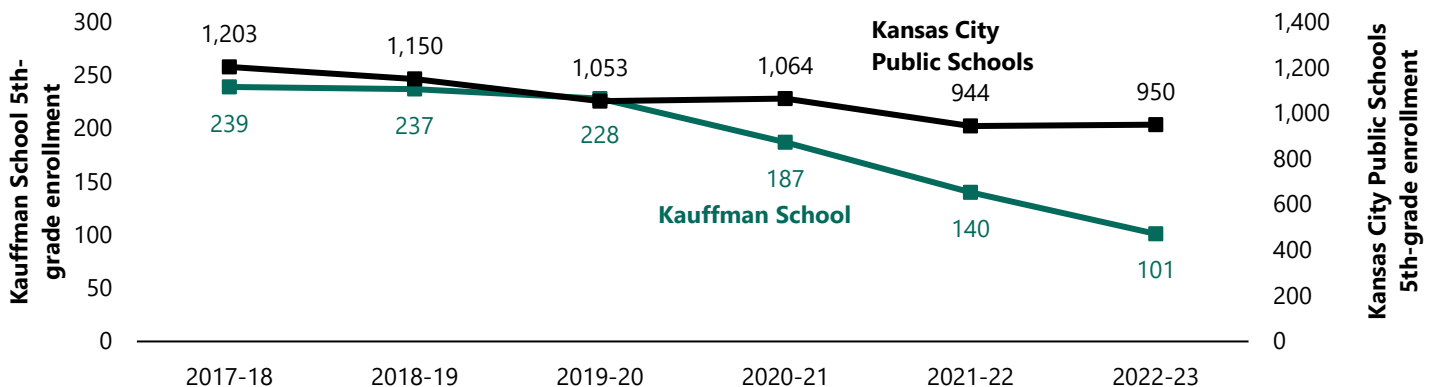


Impacts on attendance were positive in 2021-22. Attendance impacts could not be measured in 2020-21 due to remote learning during most of the school year. During 2021-22, though overall attendance rates were lower than in previous years, the Kauffman School continued its prior track record of having a positive impact on student attendance. Kauffman student attendance rates were approximately 1 percentage point higher than those of comparison students.

Suspension rates at the Kauffman School departed from prior trends and were significantly higher than comparison schools in 2021-22. During recent years, the Kauffman School had significantly lower suspension rates than comparison schools. However, during 2021-22, suspension rates at the Kauffman School increased, such that Kauffman students were 12 percentage points more likely to receive at least one suspension than comparison students.

Fifth-grade enrollment at the Kauffman School has been declining since the 2019-20 school year. Fifth-grade enrollment at the Kauffman School has declined from 228 students in 2019-20 to 101 students in 2022-23 (Figure ES.3). Though 5th-grade enrollment for Kansas City Public Schools has also declined some, the declines in enrollment at the Kauffman School have been substantially larger.

Figure ES.3. Fifth-grade enrollment at the Kauffman School has declined since 2019-20



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The authors are grateful to the Missouri Department of Elementary and Secondary Education, the Kauffman School, and the StudentTracker service from the National Student Clearinghouse for providing the data used in this report. We thank the following Mathematica staff who contributed to the study: Brian Gill provided important feedback on the report, and Ira Nichols-Barrer gave valuable input on the study design. Jennifer Brown edited the report, and Jackie Drummond and Sharon Clark formatted it. The cover photo was taken by Mathematica staff during a site visit at the school. This report is based on findings from an evaluation funded by the Ewing Marion Kauffman Foundation.

I. Background about the Kauffman School

The Kauffman School enrolled its first class of 5th-graders in fall 2011. Each year, the Kauffman School added a grade, until it included all middle and high school grades. In the 2021-22 school year, the Kauffman School enrolled 1,089 students in grades 5 through 12; 82 percent of the students qualify for free or reduced-price lunch, and 91 percent were Black or Hispanic. Box 1 summarizes the hallmarks of the Kauffman School; see Section A in the appendix for additional details.

In 2020-21, Kauffman School students spent most of the year learning remotely, only returning to in-person learning on April 5, 2021.¹ The Kansas City Public School District resumed in-person instruction three weeks earlier, on March 15, although Kansas City district students received only two more weeks of in-person instruction due to the timing of a spring break. Full-year in-person instruction at the Kauffman School and throughout Kansas City resumed during the 2021-22 school year.

Box 1. The hallmarks of the Kauffman School

1. **Ambitious academic goals.** The Kauffman School expects its students to excel academically and achieve at least 1.25 years of growth in mathematics, science, and reading each year.
2. **High attendance and character expectations.** The Kauffman School has high goals for student attendance (95 percent average daily attendance) and character (good citizenship, full observance of school policies and procedures).
3. **Extended school year.** Kauffman students receive approximately one and a half more weeks of schooling each year than do students in traditional public schools in Kansas City.
4. **Increased mathematics and reading instructional time.** Each day, Kauffman students take a double period of mathematics and two to three periods of English language arts (ELA).
5. **Intensive data-driven decision making.** With its strong emphasis on results, the Kauffman School uses a large assessment portfolio to help teachers and administrators make data-driven decisions about how best to adapt instruction to meet students' needs.
6. **Extensive professional development for teachers.** Teachers at the Kauffman School participate in (1) a multiweek professional development program focused on curriculum, instruction, and school culture each summer preceding the start of the school year; (2) observations and feedback from administrators several times per week; (3) weekly individual coaching sessions; and (4) group-based professional development sessions every Friday afternoon, focused on various topics related to curriculum, instruction, and assessment (Gentile et al. 2014).
7. **Well-established cultural norms.** School administrators noted that "the Kauffman School takes an intentional approach to establishing a culture of shared values that affirm student identity, develop conscious citizens, and maintain high expectations, all in pursuit of its mission: Creating College Graduates" (personal communication, April 12, 2017). The Kauffman School makes continual efforts to communicate explicitly—to all school staff, students, and families—the school's values, expectations, and norms.

¹ Information about Missouri Department of Elementary and Secondary Education (DESE) responses to the COVID-19 pandemic, including school closure and re-opening dates, is available from the Missouri DESE website at <https://dese.mo.gov/communications/coronavirus-covid-19-information-archived-information>.

II. The Kauffman School Has a Positive Impact on Rates of Enrollment in Four-Year Colleges

A. Impact on college enrollment

The Kauffman School has a substantial positive impact on enrollment in four-year colleges. Students from the third cohort who enrolled in the Kauffman School were 14 percentage points more likely to enroll in a four-year college within six months of their expected high school graduation date (May 2021) than if they had enrolled in another Kansas City school, and students in the fourth cohort were 10 percentage points more likely to enroll in a four-year college (Figure II.1). The impact of the Kauffman School on the chance of enrolling in any college (two-year or four-year) was 8 percentage points in 2020-21 and 9 percentage points in 2021-22.

The impacts for the third and fourth cohorts were smaller than the average impacts in previous years: students from the first two cohorts were 19 percentage points more likely to enroll in a four-year college and 17 percentage points more likely to enroll in any college. However, the differences in impacts between the fourth cohort and the first two cohorts were not statistically significant, and the Kauffman School's impact on students' college outcomes continues to be substantial. The gap in rates of enrollment in four-year colleges in Missouri for Black high school seniors is 12 percentage points, meaning that even the 10-percentage point impact for the most recent cohort of Kauffman students is large enough to close over 80 percent of the four-year college enrollment gap.²

Data

College enrollment data are from the six-month graduate follow-up file that all Missouri districts are required to submit to the state. See Section B.2 in the appendix for additional details.

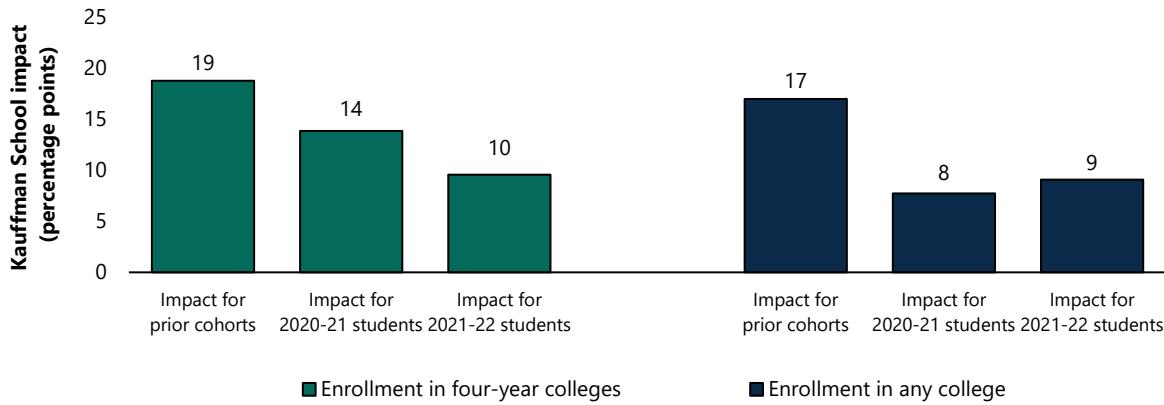
Methods

To measure the impact of the Kauffman School—overall and by student subgroup—on high school graduation and college enrollment, we identified a group of students in other Kansas City district and charter schools who had similar demographic characteristics and achievement at the end of 4th grade. We compared the high school graduation and college enrollment outcomes of these two groups of students eight years later, after they were expected to graduate from high school. All students who were enrolled for at least part of their 5th-grade year in the Kauffman School were classified as a Kauffman student, even if they subsequently left the Kauffman School. See Section C in the appendix for more details.

This section compares average impacts across the first two cohorts of Kauffman students to impacts for the third and fourth cohorts. See Section F in the appendix for impacts reported separately for the first two cohorts.

² We calculated the gap in enrollment in four-year colleges for Black students in Missouri as the difference in the rate of enrollment in four-year colleges among 12th-grade students in 2022 between Black students and other (non-Black and non-Hispanic) students. The data we receive from the Missouri DESE contain only three race/ethnicity categories: Black, Hispanic, and other. This practice limits the amount of data that needs to be redacted to adhere to the department's data security policies (see Section B.2 in the appendix).

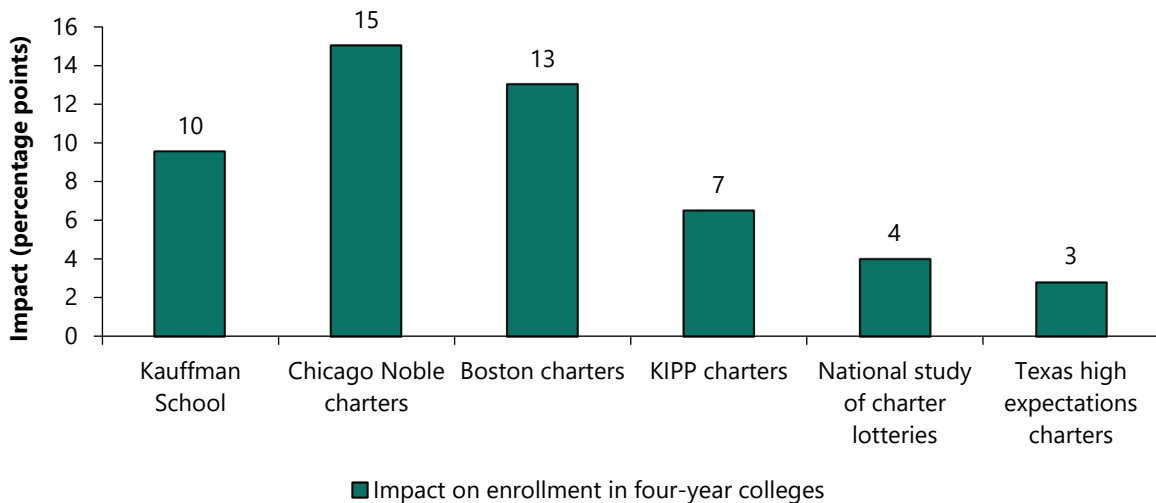
Figure II.1. The Kauffman School has a substantial positive impact on enrollment in four-year colleges



Note: The prior impacts on enrollment in four-year colleges and enrollment in any college, as well as the 2020-21 impact on enrollment in four-year colleges, are significant at the 0.01 level. The p-value of the 2021-22 impact on enrollment in four-year colleges is 0.08.

The Kauffman School’s impact in 2021-22 on enrollment in four-year colleges is in the same range as the average impacts found in studies of other high-performing charter schools (Figure II.2). The Kauffman School’s impact on enrollment in four-year colleges in 2021-22 was somewhat lower than the impact of the average Chicago Noble charter school analyzed by Davis and Heller (2019) and the average Boston charter school studied by Angrist et al. (2016). The Kauffman School’s impact was larger than the average KIPP middle school analyzed by Demers et al. (2023), the average school included in a national study of charter lotteries (Place and Gleason 2019), and also larger than charter schools in Texas that have higher behavioral expectations and are more likely to have an extended school day and year than other charter schools (Dobbie and Fryer 2020).

Figure II.2. The Kauffman School’s impact in 2021-22 on enrollment in four-year colleges is in the same range as impacts found in studies of other high-performing charter schools



Sixty-six percent of Kauffman School graduates in 2022 enrolled in a four-year college. One of the goals stated in the Kauffman School's charter is that at least 75 percent of graduating seniors attend a four-year college. For its first two cohorts of graduates, the Kauffman School achieved this goal, with 79 percent of graduating seniors in the first cohort and 81 percent of graduating seniors in the second cohort enrolling in a four-year college. For the third and fourth cohorts, however, the Kauffman School fell short of the goal, with just 52 percent of graduating seniors enrolling in a four-year college in 2021 and 66 percent doing so in 2022.³

B. Impact on high school graduation

In 2021 and 2022, the rate at which Kauffman School students graduated from high school was similar to that of comparison students. We estimated impacts on high school graduation by comparing the graduation outcomes of students who enrolled in the Kauffman School in 5th grade with similar comparison students in Kansas City eight years later, when these students were expected to graduate from high school. Similar to prior years, there was no significant difference between the graduation rates of Kauffman and comparison students who were expected to graduate in 2021 (89 percent for Kauffman students and 85 percent for comparison students). There was also no difference in the graduation rates for Kauffman and comparison students who were expected to graduate in 2022 (85 percent for both groups). See Section D.1 in the appendix for additional details.

This result may appear to conflict with Missouri state accountability reports. Those reports show that the Kauffman School had a 94 percent adjusted-cohort graduation rate in 2021-22, a 96 percent adjusted-cohort graduation rate in 2020-21, an 88 percent adjusted-cohort graduation rate in 2019-20, and a 100 percent adjusted-cohort graduation rate in 2018-19.⁴ The Missouri accountability formula calculates the graduation rate among all students who enrolled as first-time 9th-graders in the Kauffman School and excludes students who transferred to another school. In contrast, for the impact analysis, we calculated the graduation rate among all students who first enrolled as 5th-graders in the Kauffman School, including those who subsequently transferred to other schools in Missouri. When we include students who transferred in the calculation of the 2021-22 graduation rate, 85 percent of students who entered the Kauffman School in 5th grade graduated high school—not a significantly different rate from that of comparison students in Kansas City.

For the purposes of the impact analysis, counting students who transferred out of the Kauffman School as Kauffman students defuses the potential criticism that the Kauffman School's effects are overestimated because low-achieving students have left the charter school. The impacts we present can be interpreted as the effect of enrolling in the Kauffman School, accounting for the chance that a student might transfer out of the school. Section C.2 in the appendix provides additional details.

³ Because the Kauffman School's college enrollment goal is for students who graduate from the Kauffman School, the college enrollment rate is based on students who remained enrolled in the Kauffman School through the end of 12th grade. This sample is different from the sample used to calculate the impact of the Kauffman School on enrollment in four-year colleges, which includes all students who enrolled in the Kauffman School in 5th grade, regardless of whether they eventually transferred out of the school.

⁴ See the District Adjusted Cohort Graduation Rate report, available at <https://apps.dese.mo.gov/MCDS/FileDownloadWebHandler.ashx?filename=cfe1a5d1-8b6aDistrict%20Adjusted%20Cohort%20Graduation%20Rate.xls>.

C. Impacts by student group

The impacts of the Kauffman School on college enrollment and high school graduation were statistically indistinguishable for students with different demographic characteristics and baseline achievement levels. In addition to estimating the Kauffman School's overall impact on college enrollment and high school graduation, and on growth in student achievement as described further in Section III, we tested for differences in the school's impact for various groups of students. Specifically, we examined whether impacts varied by student gender and pre-enrollment achievement level. (We could not examine impacts for different racial and ethnic groups for the college enrollment and high school graduation outcomes because the large majority of Kauffman School students included in that analysis were Black, with insufficient numbers of students from other racial and ethnic groups.) These analyses focused on impacts averaged across the two most recent school years (2020-21 and 2021-22).

Two issues arise when examining impacts separately for specific groups of students. First, the estimated impacts are less precise relative to the main analysis because the sample sizes are smaller. Second, performing statistical tests for multiple groups increases the risk of finding a statistically significant difference due to chance alone. To address these concerns, we focused only on results that were statistically significant at the 1 percent level. In addition, we reported group-specific results only in cases where at least 10 Kauffman students from the relevant group entered the analysis. Section C in the appendix describes additional details of our approach, and Section D in the appendix presents the full results.

Across all student groups we examined, the Kauffman School had a similar positive impact on enrollment in four-year colleges. More specifically, the Kauffman School's impact on enrollment in four-year colleges did not significantly differ between boys and girls, or between students with different achievement levels prior to enrolling in the Kauffman School. For high school graduation and enrollment in any college, we also found statistically indistinguishable impacts for students when looking specifically at gender and academic background.

III. The Kauffman School's Impacts on Student Achievement Declined in 2020-21 Under Remote Instruction, But Improved in 2021-22

A. Impacts on state test scores

Compared to the results achieved in previous years, the Kauffman School's cumulative impact on student achievement growth in 2020-21 was substantially smaller. Kauffman students spent most of 2020-21 learning remotely, as did students in the Kansas City Public School District. Research has shown that the COVID-19 pandemic reduced student achievement, and students who attended school remotely performed worse than students who attended in person, both nationally and in Missouri (Goldhaber et al. 2022; Halloran et al. 2021; Kuhfeld et al. 2020; Missouri DESE 2021b). In 2020-21, learning growth for both Kauffman students and comparison students was similar in most grades and subjects. The lower impacts for 2020-21 may indicate that students at the Kauffman School struggled more with remote learning than did students in Kansas City public district or charter schools.

After full-year in-person learning resumed in 2021-22, the Kauffman School was once again producing positive impacts in most grades and subjects. Though the size of the Kauffman School's impacts on student achievement increased substantially in 2021-22, the impacts did not return to pre-pandemic levels in most grades and subjects.

In Figures III.1 to III.3, we show the impacts on mathematics, ELA, and science achievement for 2020-21 and 2021-22 compared to the impacts averaged across prior years (through 2018-19, because tests were canceled in 2019-20 due to the COVID-19 pandemic). We measured the Kauffman School's impacts on student performance in mathematics, ELA, and science on the Missouri Assessment Program (MAP) exams one to four years after enrollment, and on end-of-course exams in Algebra, English II, and Biology five to six years after enrollment.

In Figures III.1 to III.3, we show the impact estimates converted to years of learning growth for Kauffman students through a commonly used conversion method for effect sizes (Bloom et al. 2008). When performing this conversion, we assumed that comparison students in Kansas City public schools achieve, on average, one year of learning growth per school year, as indicated by the black horizontal lines. See Section D in the appendix for the impact estimates presented in effect-size units (standard deviations of student achievement) and additional details about the conversion to years of learning growth. The

Data

Data include scores on the Missouri Assessment Program, end-of-course (EOC) exams, and the ACT, as well as information on attendance, suspensions, and demographic characteristics of the students. No Algebra I or Biology EOC exam scores were available in 2020-21. Section B in the appendix contains additional details.

Methods

Similar to the methods used in the previous section, to measure the impact of the Kauffman School on student achievement—overall and by student subgroup—we identified a group of students in other Kansas City district and charter schools who had similar demographic characteristics and achievement in 3rd and 4th grade. We compared these two groups of students based on key outcomes as they moved from 5th grade through 10th grade. All students who were enrolled for at least part of their 5th-grade year in the Kauffman School were classified as Kauffman students even if they subsequently left the Kauffman School.

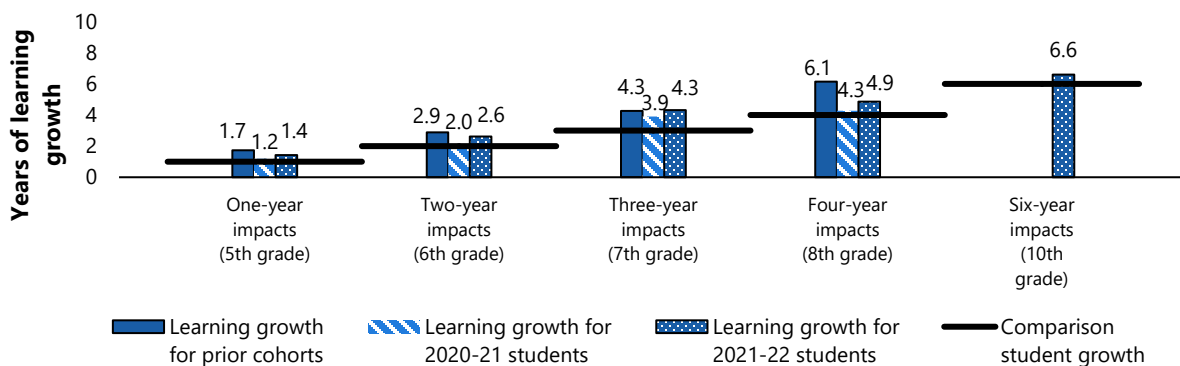
See Section C in the appendix for more details.

impacts of the Kauffman School are represented by the differences between the height of the bars and the black horizontal lines.

We recommend interpreting the one-year (5th grade) impacts from 2020-21 with caution for two reasons. First, whereas the impacts for prior cohorts measured the one-year learning growth from 4th to 5th grade, the baseline scores used in 2020-21 were from 3rd grade, as no scores were available from the prior year (2019-20) due to the COVID-19 pandemic. Second, the 2020-21 one-year results reflect the Kauffman School’s impact on a cohort of students who were simultaneously adjusting to both a new school and remote learning, and who had never attended the Kauffman School in person. By contrast, comparison schools in the Kansas City school district serve grades PK–6 and other Kansas City charters tend to be either PK–5 or PK–8. Thus, even though comparison students in 5th grade were learning remotely, they were not adjusting to attending a new school.

In 2020-21, the differences between learning growth for Kauffman students and comparison students in mathematics were not statistically significant except for a positive impact on achievement in 7th grade (Figure III.1). Except for 7th grade, the Kauffman School’s impacts on mathematics were smaller in all grades compared to the impacts in prior years. In 2021-22, impacts in mathematics improved in all grades.

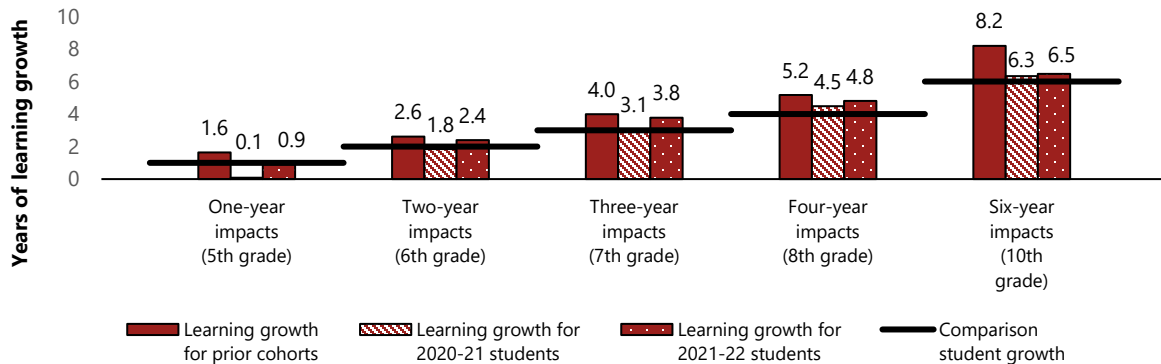
Figure III.1. The Kauffman School’s impact on mathematics achievement declined in 2020-21 but improved in 2021-22



Note: All impacts for combined prior cohorts and 2021-22 are statistically significant at the 1 percent level. The three-year impact in 2020-21 is also statistically significant at the 1 percent level. The one-, two-, and four-year impacts in 2020-21 are not statistically significant. The decline in impact between prior years and 2020-21 is significant at the 1 percent level in all grade levels except 7th grade. The decline in impact between prior years and 2021-22 is significant at the 1 percent level in 8th grade. The four-year mathematics impact is based in part on imputed outcome data (see Section C in the appendix for details). In 2018-19 and prior years the Kauffman School administered the Algebra end-of-course exam to 9th-grade students. The Kauffman School did not administer the Algebra end-of-course exam in 2020-21; in 2021-22, the school administered the exam to 10th-grade students for the first time.

The Kauffman School experienced statistically significant declines in ELA impacts in all grades between 2020-21 and prior years (Figure III.2). The Kauffman School’s 2020-21 impact on ELA learning growth was negative and statistically significant in 5th grade, positive and statistically significant in 8th grade, and was not significantly different from zero in other grades. ELA achievement impacts improved across all grades in 2021-22, though they remained below pre-pandemic levels.

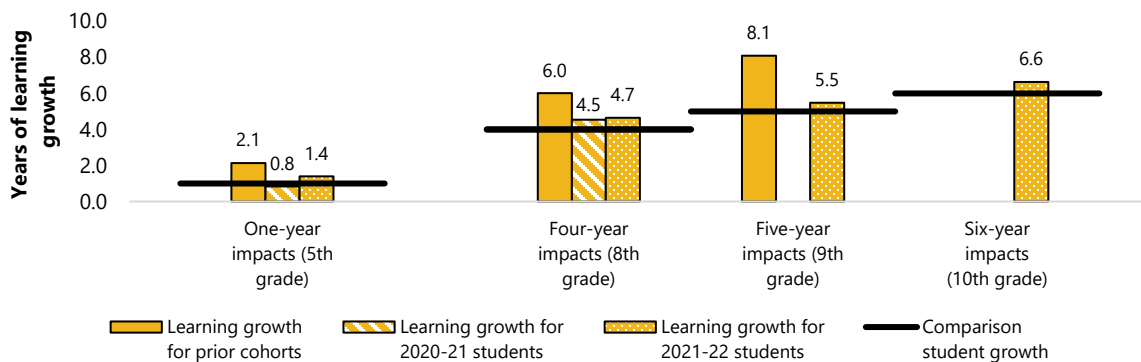
Figure III.2. The Kauffman School’s impact on ELA achievement declined in 2020-21 but improved in 2021-22



Note: Prior years’ impacts are statistically significant at the 1 percent level. The one-year impact in 2020-21 is negative and statistically significant; the two-, three-, and six-year impacts in 2020-21 are not statistically significant. The three- and four-year impacts in 2021-22 are positive and statistically significant at the 1 percent level. The one-, two-, and six-year impacts in 2021-22 are not statistically significant. The decline in impact between prior years and 2020-21 is significant at the 1 percent level in all grade levels. The decline in impact between prior years and 2021-22 is significant at the 1 percent level in 5th and 10th grade. The six-year impact estimates are based on English II end-of-course exams.

Similar to mathematics and ELA, the Kauffman School experienced a statistically significant decline in science impacts in 5th and 8th grades between 2020-21 and prior years (Figure III.3). In 2020-21, the impact of the Kauffman School on 5th and 8th grade science achievement was not significantly different from zero. Achievement impacts improved for 5th and 8th grades in 2021-22, though they did not return to pre-pandemic levels. Science impacts for 9th and 10th grade were also positive and modest in size in 2021-22.

Figure III.3. The Kauffman School’s impact on science achievement declined in 2020-21 but improved in 2021-22



Note: Prior years’ impacts are statistically significant at the 1 percent level. The four-year impact in 2021-22 is positive and statistically significant at the 1 percent level. The decline in impact between prior years and 2020-21 is significant at the 1 percent level in all grade levels. The decline in impact between prior years and 2021-22 is significant at the 1 percent level in all grade levels. Both five- and six-year impact estimates are reported for the 2021-22 school year because the Kauffman School administered the Biology end-of-course exam to students in 9th and 10th grade that year.

One of the goals stated in the Kauffman School's charter is that, on average, its students will achieve at least 1.25 years of learning growth for each year they are enrolled in the school. Except for a three-year growth in mathematics (7th grade), the Kauffman School fell short of this goal in all tested subjects and grades in 2020-21. The Kauffman School came closer to reaching this goal in 2021-22, though it did not return to pre-pandemic levels. In 2021-22, one-, two-, and three-year impacts in mathematics; three-year impacts in ELA; and the one-year science impacts indicate at least 1.25 years of learning growth for each year of enrollment. The school fell short of the goal in other grades and subjects.

The lower impacts in 2020-21 compared to prior years may indicate that students at the Kauffman School struggled more with remote learning than did students in Kansas City public district or charter schools. Kauffman students also returned to in-person learning two weeks after their peers attending district schools, which could have contributed to lower achievement (see Goldhaber et al. 2022; Halloran et al. 2021).

One possible caveat to the 2020-21 impact findings is that Missouri extended the spring 2021 testing window to allow schools to administer tests as late as June 15 (Missouri DESE 2021a). However, because our data do not contain information about how the timing of testing varied across schools, we cannot account for how differences in that timing could have influenced the impact calculations. Differences in test participation rates across years likely did not affect the results. Across the state as a whole, more than 90 percent of students participated in testing in 2020-21. Using publicly available information from DESE and the Common Core of Data, we found that test-taking rates for Kauffman School and Kansas City Public School District students were both about 95 percent, similar to the rates in prior years (Missouri DESE 2022; Common Core of Data 2022).

In 2021-22, the Kauffman School's impact on student performance on the Government end-of-course exam was not statistically significant. In 2021-22, the Kauffman School administered the Government end-of-course exam for the first time, to 12th-grade students. The Kauffman School's impact on Government end-of-course exam scores was positive and equivalent to 0.4 additional years of learning growth for Kauffman students after eight years of enrollment, though the impact was not statistically significant. Because 2021-22 was the first year the Kauffman School administered the Government end-of-course exam, we cannot measure changes in impacts over time. See Table A.7 in the appendix for the 2021-22 impact displayed in effect-size units.

B. Impacts by student group

The Kauffman School's impacts on student achievement growth in 2020-21 and 2021-22 were statistically indistinguishable for students with different demographic characteristics and baseline achievement levels. In addition to estimating the Kauffman School's impact on student achievement growth in 2020-21 and 2021-22 overall, we tested for differences in the school's impact by specific student groups. Specifically, we examined differences in terms of students' gender, race and ethnicity, and achievement level prior to enrolling in the Kauffman School. To increase precision and reduce the risk of reporting a statistically significant difference due to chance alone, we aggregated the results across grade levels to a single subject-level estimate for each student group.

We did not find statistically significant differences in the Kauffman School's impact on student achievement growth for any of the specific groups examined. For all outcomes, the Kauffman School had similar impacts for boys and for girls, and for students with both low and relatively higher baseline achievement on state tests. When comparing impacts for Hispanic students and students of other races and ethnicities to impacts for Black students, there were no statistically significant differences, though the results are imprecise due to the small number of Hispanic students and students of other races included in the analysis. The full set of results for group-specific impacts is in Section D of the appendix.

The impacts of the school for different groups of students provide some information on how the school is likely to affect achievement gaps, both internally and relative to students citywide. Internally, most of the differences in impacts across groups are small, suggesting that gaps between student groups inside the school are not likely to change substantially as students progress through the school. Externally, however, the positive impacts the Kauffman School has on disadvantaged groups of students (for example, students who were low achieving prior to enrolling) will reduce the gaps between those students and more-advantaged students elsewhere in Kansas City.

C. Comparison of Kauffman School impacts to district and charter schools in Kansas City

In our main results, the comparison group for Kauffman students consists of similar students in district and charter schools in Kansas City. To understand how the Kauffman School performed relative to each of these groups of schools, we separately compared the Kauffman School's impacts to the impacts of other charter and non-charter schools in Kansas City.

In 2021-22, the Kauffman School's impacts on test scores were similar relative to district schools or charter schools in Kansas City. We compared the estimated years of learning growth for Kauffman students separately to two groups: students attending other charter schools in Kansas City and students attending other district-operated (non-charter) schools in Kansas City. See Table A.9 in the appendix for details.

D. Goal that 75 percent of students score proficient or advanced on MAP exams

One of the Kauffman School's charter goals is that at least 75 percent of students enrolled for three consecutive years achieve proficient or advanced scores on all subjects on the MAP exam. To assess the school's progress toward this ambitious goal, we examined the proficiency rates of the school's 7th-graders who were enrolled continuously since the beginning of 5th grade.⁵ The school has not achieved 75 percent proficiency rates for 7th-graders in the past, but prior cohorts of students made substantial progress toward that goal, improving in mathematics from 32 percent proficient or advanced before

⁵ Due to changes to the state assessments over the past several years, all of the proficiency rate results should be interpreted with caution. A new MAP exam aligned to the Common Core State Standards was administered in 2014-15 and was then replaced by an exam aligned to preliminary Missouri Learning Standards in 2015-16. A third new version of the exam aligned to revised Missouri Learning Standards was administered in 2017-18 and continued to be administered in future years (Missouri DESE 2017). Proficiency rates on the 2017-18 MAP exam were generally lower statewide than in previous years, indicating the new assessments may be more challenging (Hunn and O'Dea 2019). Section E in the appendix provides additional details.

enrolling to 58 percent by the end of 7th grade; and improving in ELA from 40 percent to 59 percent (Figures III.4 and III.5).⁶

For 7th-graders in 2020-21 who had been enrolled continuously in the Kauffman School for three years, proficiency rates in mathematics and ELA rose after one year but fell to pre-enrollment levels in 2020-21. The rapidly increasing proficiency trajectories for prior cohorts of students were absent for 7th-graders in 2020-21. Before enrolling in the Kauffman School, 24 percent of 7th-grade Kauffman students in 2020-21 scored proficient or advanced on the mathematics MAP test. Although proficiency rates rose to 35 percent after one year, after three years of enrollment, proficiency rates fell, such that only 22 percent of students in this cohort scored proficient or better in mathematics (Figure III.4). The changes in ELA proficiency rates were similar. Although proficiency rates increased from 22 percent to 37 percent after one year of enrollment, only 18 percent of 7th-grade Kauffman students scored proficient or advanced on the 2020-21 ELA MAP test (Figure III.5). The lower proficiency rates for Kauffman students in 2020-21 are in line with lower proficiency rates for Missouri students statewide (Missouri DESE 2021b) and consistent with our finding that the school's impact declined substantially in that year.

For 7th-graders in 2021-22, proficiency rates in mathematics and ELA initially fell but ultimately rose 7 percentage points and 1 percentage point above pre-enrollment levels, respectively, though 7th-grade proficiency rates are still below pre-pandemic levels. Like the cohort one year ahead of them, the rapidly increasing proficiency trajectories for prior cohorts of students were absent for 7th-graders in 2021-22. Unlike the cohort one year ahead of them, 7th-graders in 2021-22 ultimately scored slightly higher than their pre-enrollment levels. Before enrolling in the Kauffman School, 28 percent of 7th-grade Kauffman students in 2021-22 scored proficient or advanced on the mathematics MAP test (Figure III.4). Proficiency fell to 18 percent after two years of enrollment but rose to 35 percent after three years of enrollment. The changes in ELA proficiency followed a similar pattern, though it did not rise above pre-enrollment levels to the same extent as mathematics (Figure III.5). Before enrolling in the Kauffman School, 21 percent of 7th-grade Kauffman students in 2021-22 scored proficient or advanced on the ELA MAP test. Proficiency fell to 17 percent after two years of enrollment but rose to 22 percent after three years of enrollment. The lower proficiency rates for students in 2020-21—and the partial recovery in 2021-22—are similar to the trend in proficiency rates for Missouri students statewide (Missouri DESE 2022).

⁶ For consistency, these figures show results for students with complete testing data available (that is, 4th-, 5th-, 6th-, and 7th-grade scores, except scores from 2019-20, which are missing for all students). Tables A.10 and A.11 in the appendix show the results for all students with three and four consecutive years of enrollment.

Figure III.4. Recent trends in mathematics proficiency rates after three years of enrollment departed from the growth prior cohorts of students had achieved

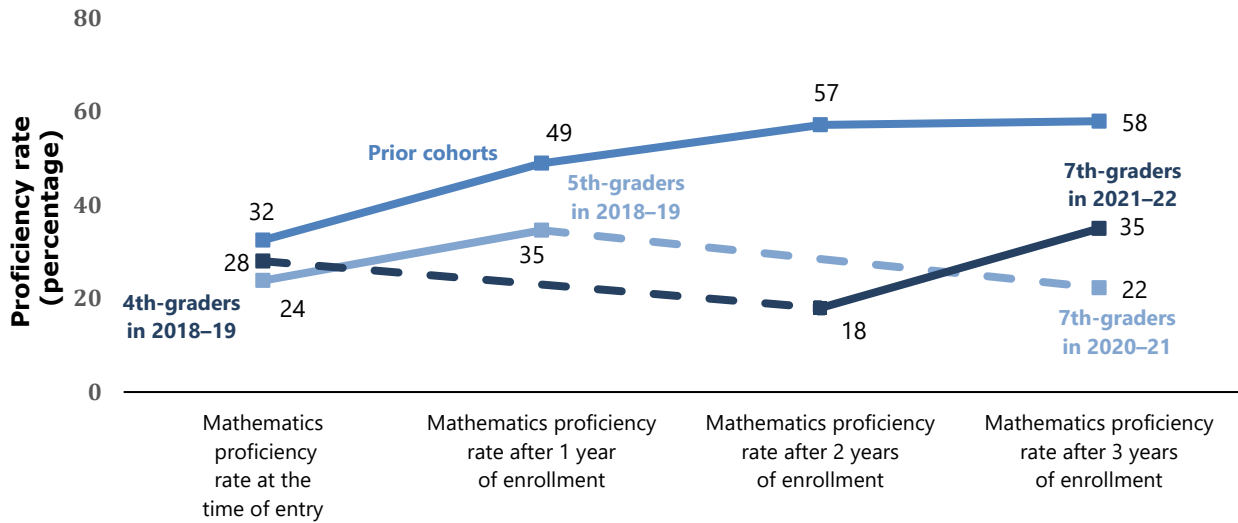
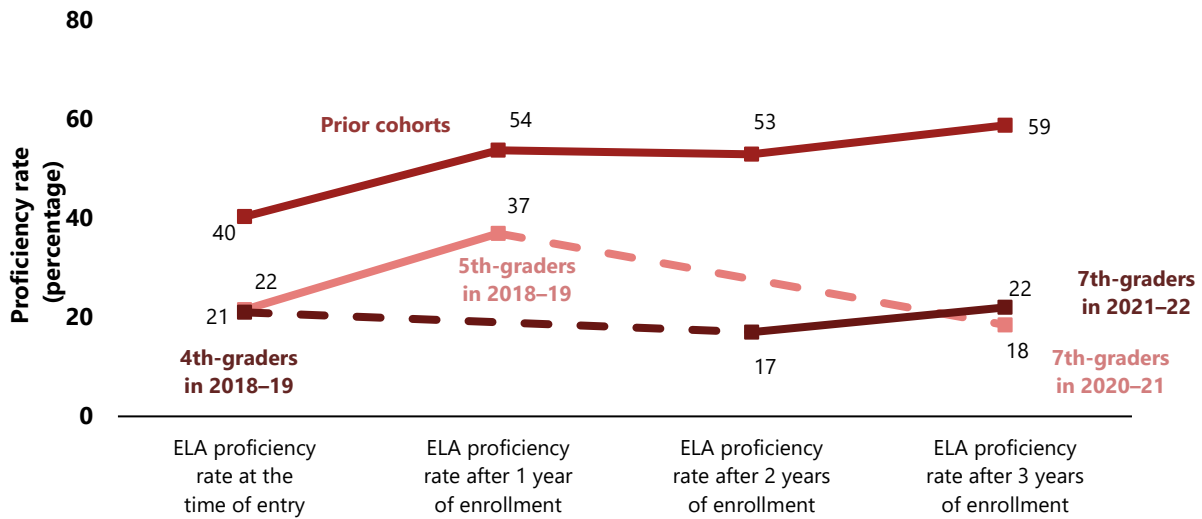


Figure III.5. Recent trends in ELA proficiency rates after three years of enrollment departed from the growth prior cohorts of students had achieved

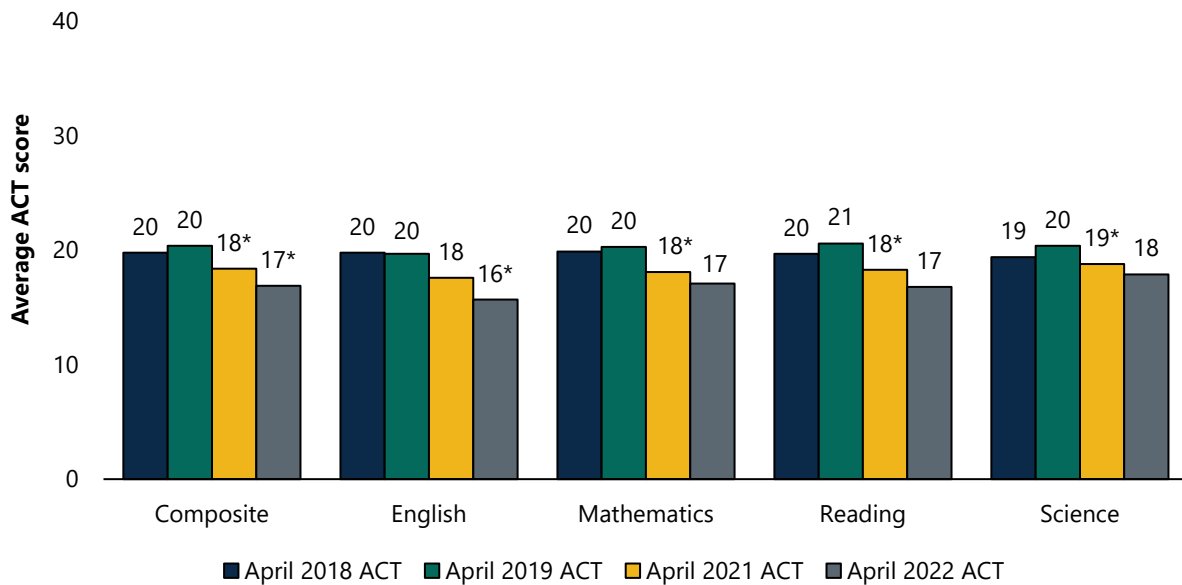


E. Average scores on the ACT have declined

Spring ACT scores for Kauffman students were lower for 11th-graders in 2020-21 and 2021-22 compared to 2018-19 and 2017-18. Among Kauffman 11th-grade students, we compared the scores that each cohort achieved on the spring ACT administration. The average scores for 11th-grade Kauffman students who took the ACT in April 2021 and 2022 were lower than the scores of 11th-grade Kauffman students who took the ACT in April 2019 (Figure III.6). The decline in Kauffman students’ ACT scores between April 2019 and April 2021 ranged from 1 to 3 points across subjects and was statistically

significant in all subjects except English. ACT scores declined by an additional 1 to 2 points between April 2021 and April 2022 (with statistically significant declines in English and for the overall composite score).

Figure III.6. Spring ACT scores for Kauffman 11th-grade students were lower in 2021 and 2022 than in 2019 and 2018



Note: Average ACT composite scores declined nationwide by 0.5 points between 2021 and 2022.

* Significantly different from previous cohort of Kauffman students at the 5 percent level.

One of the Kauffman School’s charter goals states that its students’ average ACT scores would be at the 75th percentile nationally. To assess the school’s progress toward this ambitious goal, we examined the highest composite score achieved by each cohort of Kauffman 11th-grade students across all administrations of the ACT.

Kauffman students’ ACT scores fell short of the goal of average scores at the 75th percentile nationally. Kauffman students who were in 11th grade during the 2020-21 and 2021-22 school years did not ultimately achieve the school’s ambitious goal. Based on the highest composite score students achieved across all administrations of the ACT—the score commonly used in college admissions—the average ACT composite score of Kauffman students was at the 48th percentile nationwide for 2020-21 and declined to the 36th percentile for 2021-22 (Table III.1). According to college readiness benchmarks provided by the ACT (Allen and Radunzel 2017), the percentage of Kauffman students who were college ready was 26 percent overall in 2020-21 and declined to 8 percent overall in 2021-22.

Table III.1. Highest composite ACT scores across all administrations for Kauffman students were below the 75th percentile national rank target

ACT subject	Average score 2020-21	Average score 2021-22	National percentile rank (%) 2020-21	National percentile rank (%) 2021-22	College ready (%) 2020-21	College ready (%) 2021-22
Composite	19.3	17.1	48	36	26	8
English	18.4	15.8	46	38	49	33
Mathematics	19.0	17.2	55	44	26	7
Reading	19.6	17.0	50	35	31	11
Science	19.5	17.9	52	40	24	15

Note: Results based on ACT with highest composite score across the spring, summer, and fall 2022 administrations of the exam for students who were in 11th grade during the 2021-22 school year, and similarly across spring, summer, and fall 2021 for 11th-graders during 2020-21. The conversion from average scores to national percentile ranks is based on norms provided by ACT for tests taken during the 202-22 school year, which is based on high school graduates taking the ACT in 2019, 2020, and 2021. College readiness for the composite score is defined as meeting the ACT college readiness benchmark in at least three of the four possible subjects.

Some caution is warranted when interpreting ACT performance. The number of students nationally who took the ACT has declined in recent years, with the largest drop among test takers in 2020-21. Although it is unclear whether declining participation rates result in overall increases or decreases in average scores, there are reasons to expect the national percentile rankings of scores to be less stable than those of prior cohorts of test takers (Nietzel 2021). The scores for Kauffman students in 2020-21 and 2021-22 were compared to national norms based on high school graduates taking the ACT in 2020, 2021, and 2022.

IV. Changes in The Kauffman School’s Achievement Impacts Over Time

As previously discussed in the section on impacts on state test scores, the Kauffman School’s impact in 2020-21 and 2021-22 differed from prior years. In its first eight years of operation, 2011-12 through 2018-19, the Kauffman School had consistent, sustained, and large positive impacts on student achievement. Figure IV.1 shows how the one- through six-year impacts changed over time. Unlike the large and positive impacts across all prior years, the 2020-21 results were much lower, with Kauffman students not doing notably better than comparison students across grades and subjects. The 2021-22 results show some improvement but do not recover to pre-pandemic levels in most grades and subjects. Tables A.14 through A.19 in the appendix display the impacts in effect-size units and show results from tests of whether year-to-year changes in impacts were statistically significant.

Figure IV.1. The Kauffman School’s impacts in 2020-21 differed from prior years

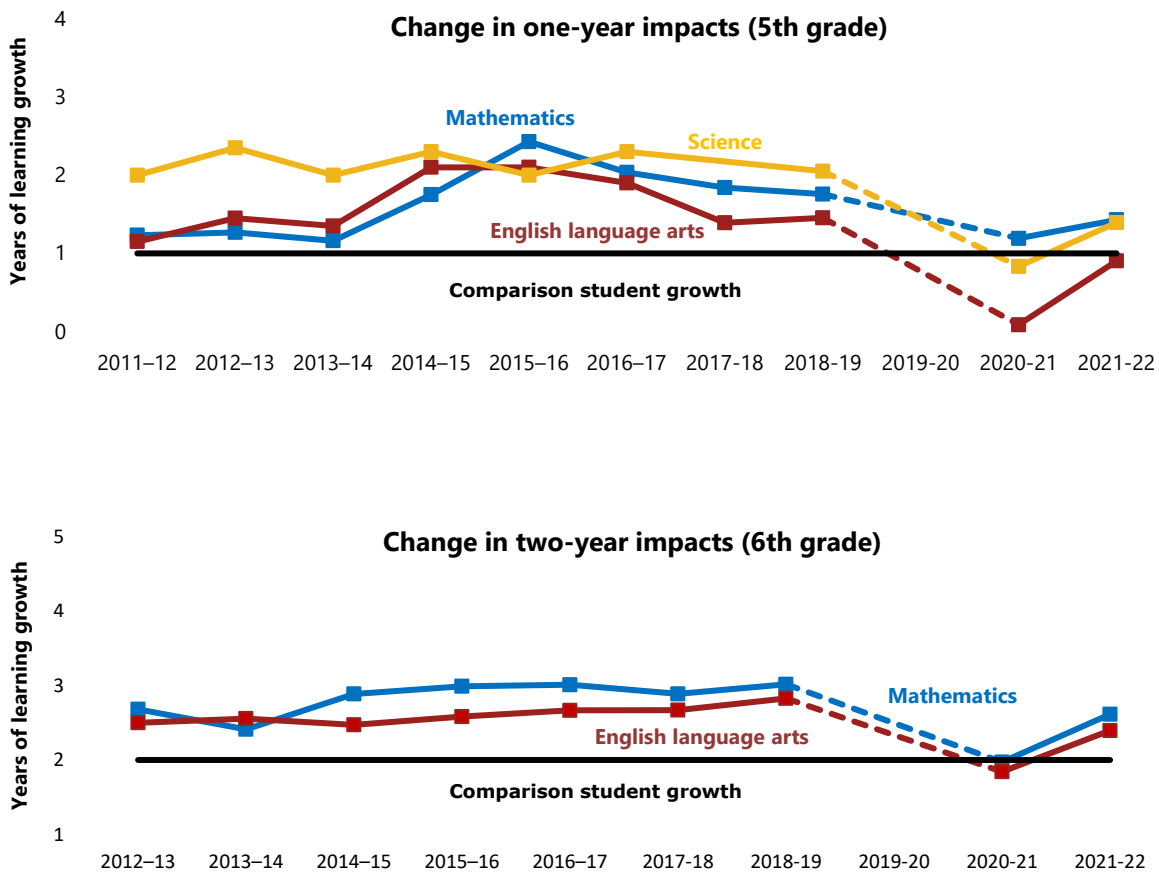


Figure IV.1 (continued). The Kauffman School’s impacts in 2020-21 differed from prior years

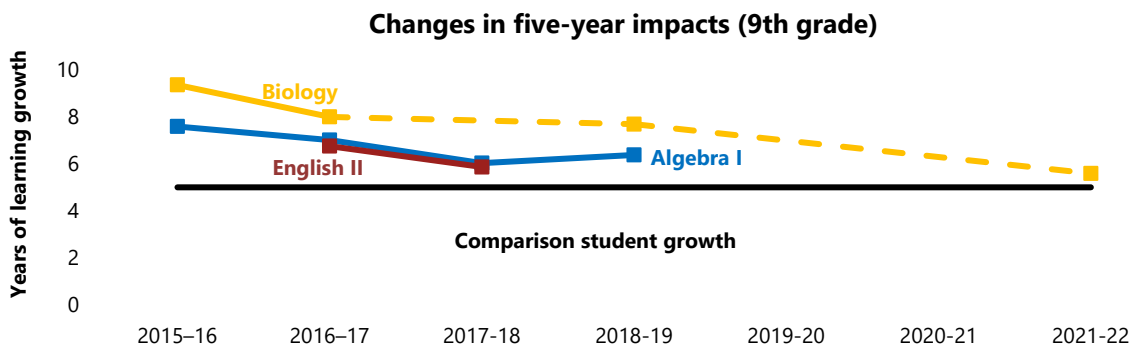
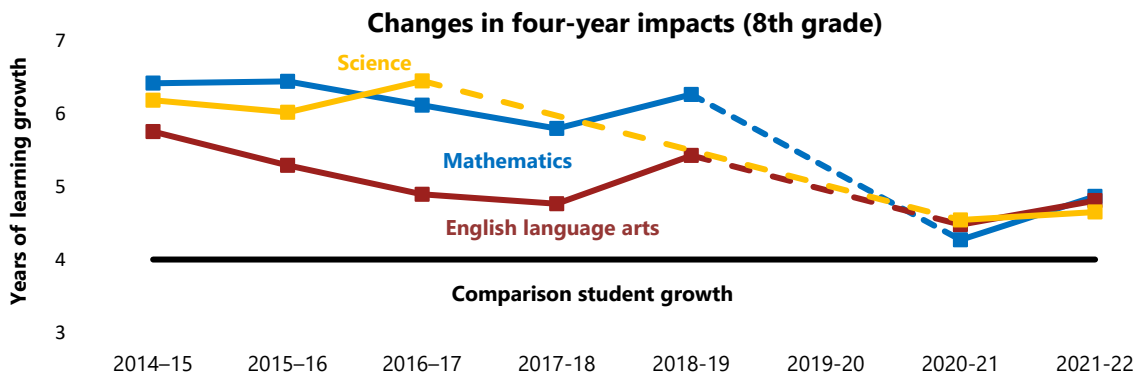
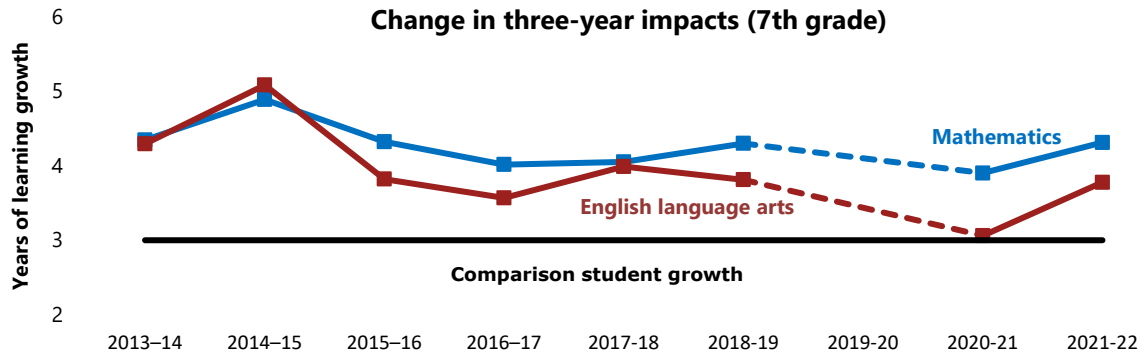
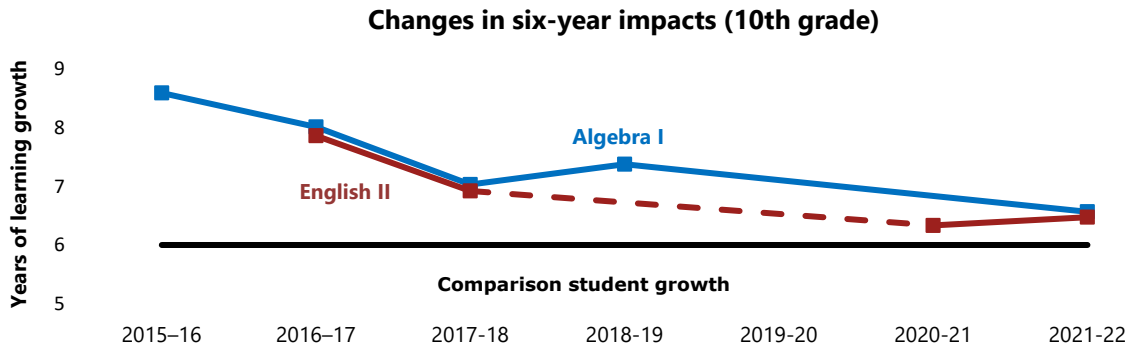


Figure IV.1 (continued). The Kauffman School’s impacts in 2020-21 differed from prior years



Note: Dashed lines indicate the Kauffman School skipped administering the exam for one or more years. Reasons might have included cancellation of state assessments due to the COVID-19 pandemic, Missouri piloting new assessments, or the Kauffman School not administering end-of-course exams to students in a particular grade and year.

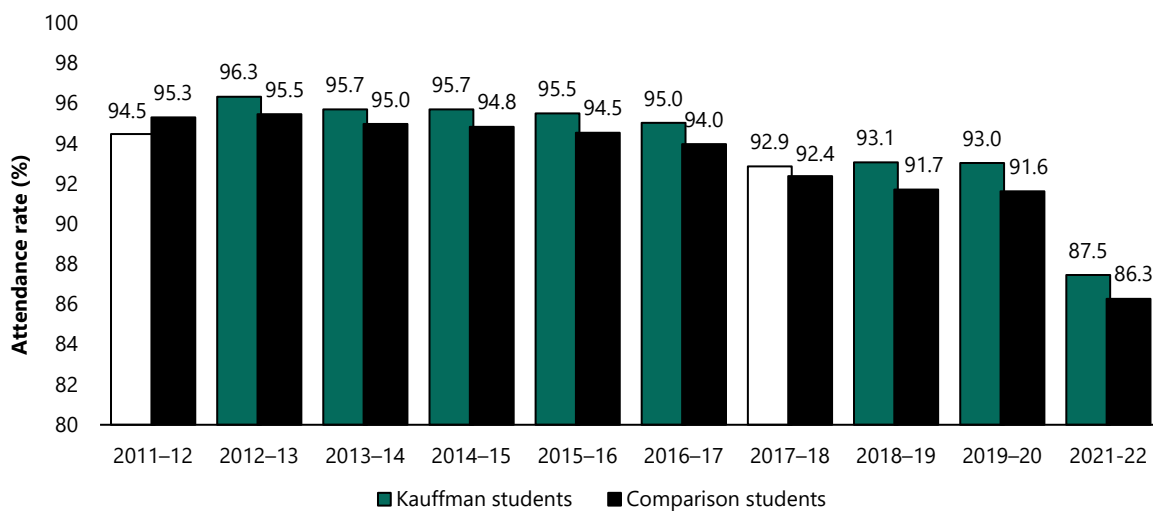
V. The Kauffman School Had a Positive Impact on Student Attendance But Had Higher Suspension Rates in 2021-22

A. Impacts on attendance and suspension rates

The Kauffman School had a significant, positive impact on student attendance rates in 2021-22.

Student attendance at both the Kauffman School and other Kansas City schools—and at schools across the country—were substantially lower in 2021-22 in the wake of the pandemic (Dee 2023). Even so, the Kauffman School had positive impacts on student attendance, outpacing attendance of comparison students by 1.2 percentage points. Kauffman students’ average attendance rate during 2021-22 was 87.5 percent, which was significantly higher than the attendance rate of comparison students, at 86.3 percent (Figure V.1, last set of columns).⁷ This year’s impact is similar in magnitude to the impact in prior years and was driven by higher attendance for high school students in particular (see Figure A.1 in the appendix for 2021-22 attendance rates by grade level).

Figure V.1. The Kauffman School had a significant, positive impact on student attendance during 2021-22



Note: Solid green bars indicate that the impact of the Kauffman School is statistically significant at the 0.05 level.

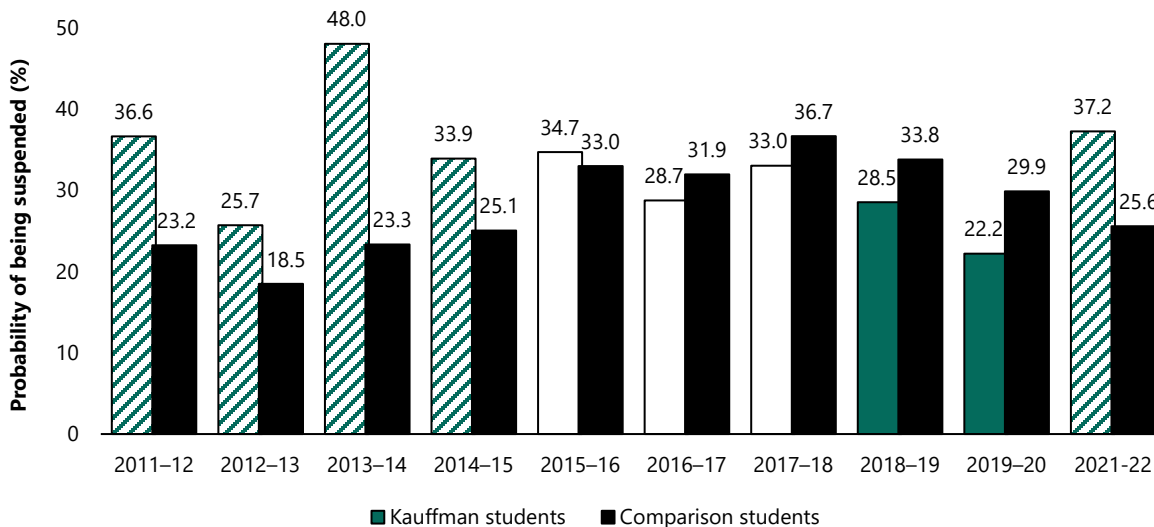
Suspension rates among Kauffman students were substantially higher than they were for comparison students in 2021-22 (Figure V.2).⁸ This higher suspension rate follows two consecutive

⁷ Bar charts in this report typically have a starting value of 0 for the y-axis. However, the bar charts for attendance rates start at 80 to highlight the relevant range of average attendance rates. It is rare for average attendance rates to be below 80 percent, so we do not show that part of the distribution.

⁸ It is important to note that the analysis of suspensions cannot distinguish effects driven by differences in student behavior from effects driven by differences in the enforcement of school policies or reporting practices. For example, if Kauffman students were more likely than students in other schools to be suspended, that could reflect a higher frequency of infractions among Kauffman students, or it could indicate that the Kauffman School suspends students for behaviors that other Kansas City schools do not consider to be infractions.

academic years during which the Kauffman School had a significant impact in reducing suspensions relative to comparison schools. In 2021-22, 37.2 percent of Kauffman students received at least one suspension during the school year, compared to 25.6 percent of comparison students. The measure in Figure V.2 combines both in-school and out-of-school suspensions.

Figure V.2. Overall suspension rates for Kauffman students were higher than they were for comparison students during 2021-22



Note: Dashed green bars indicate that Kauffman students had significantly higher suspension rates than comparison students (p-value < 0.05). Solid green bars indicate that the Kauffman students had significantly lower suspension rates.

We also measured the impact of the Kauffman School separately for in-school and out-of-school suspensions, and by grade-level. These analyses show that the impact on student suspensions is driven by higher out-of-school suspension rates among Kauffman students compared to other Kansas City students, particularly in middle school grades. Kauffman students received fewer in-school suspensions compared to other Kansas City students at every grade level (see Figures A.3 and A.4 in the appendix).

B. Impacts by student group

The Kauffman School’s impact on student attendance and suspensions in 2021-22 was statistically indistinguishable for most student groups examined. In addition to estimating the Kauffman School’s impact on student attendance and suspension rates overall, we tested for differences in the school’s impact by specific student groups. Specifically, we examined differences in terms of students’ gender, race and ethnicity, and achievement level prior to enrolling in the Kauffman School. To increase precision and reduce the risk of reporting a statistically significant difference due to chance alone, we aggregated the results across grade levels to a single school-level estimate for each student group.

Any differences in the Kauffman School’s impact on attendance and suspensions for most student groups were not statistically significant. The one exception to this is that in 2021-22, the Kauffman School had a significantly higher impact on attendance rates for students with low baseline achievement compared to

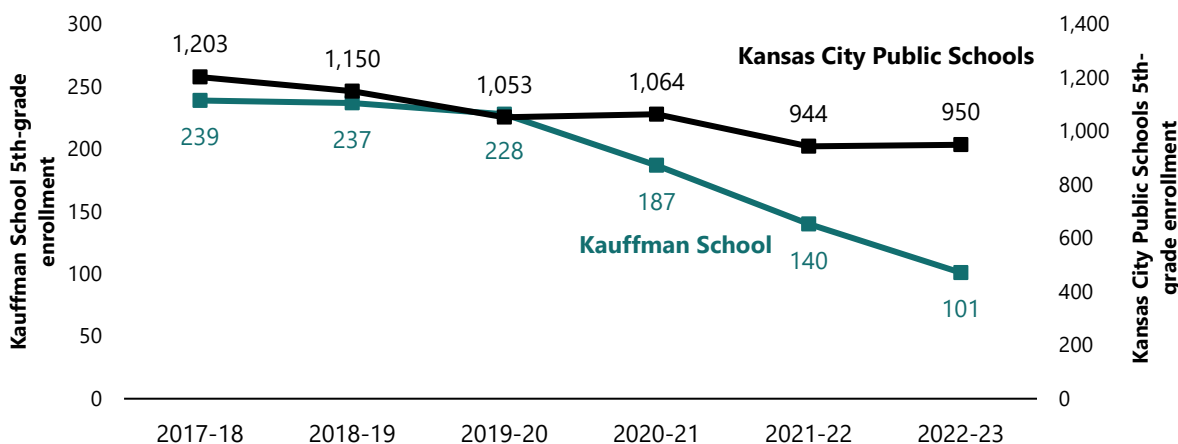
their relatively higher-achieving peers. There was no statistically significant difference in the Kauffman School's impacts on suspensions based on prior achievement. The full set of results for group-specific impacts is in Section G in the appendix.

VI. Fifth-Grade Enrollment Has Declined Substantially in Recent Years

Fifth-grade enrollment at the Kauffman School has declined since the 2019-20 academic year. Fifth-grade enrollment declined by 56 percent in recent years, decreasing from 228 students in academic year 2019-20 to 101 students in 2022-23 (Figure VI.1). These enrollment declines resulted in the Kauffman School lowering its enrollment projections for 2022-23 to a total of 950 students across all grades.⁹ The revised projection is 21 percent lower than the total enrollment of 1,203 students that the school projected in its 2021 charter school renewal application.¹⁰

To understand the extent to which demographic shifts in Kansas City may be playing a role in this decline, we compared enrollment at the Kauffman School to Kansas City Public Schools.¹¹ Though 5th-grade enrollment in the Kansas City Public School district also declined over the same period, the decline is smaller. The number of enrolled 5th-graders in Kansas City district schools has dropped from 1,053 in 2019-20 to 950 in 2022-23, which represents a 10 percent reduction in enrollment.

Figure VI.1. Fifth-grade enrollment at the Kauffman School has declined more rapidly than for all Kansas City Public Schools



Note: Figure uses enrollment data obtained from the Missouri DESE Comprehensive Data System, available at <https://apps.dese.mo.gov/MCDS/Visualizations.aspx?id=26>.

⁹ See the December 14, 2022, Ewing Marion Kauffman School Contract Amendment, available at <https://mcpsc.mo.gov/media/pdf/december-14-2022-ewing-marion-kauffman-school-contract-amendment-projected-enrollment>.

¹⁰ See the February 8, 2021, Ewing Marion Kauffman School Charter Renewal, available at <https://mcpsc.mo.gov/media/pdf/ewing-2021-2031-renewal>.

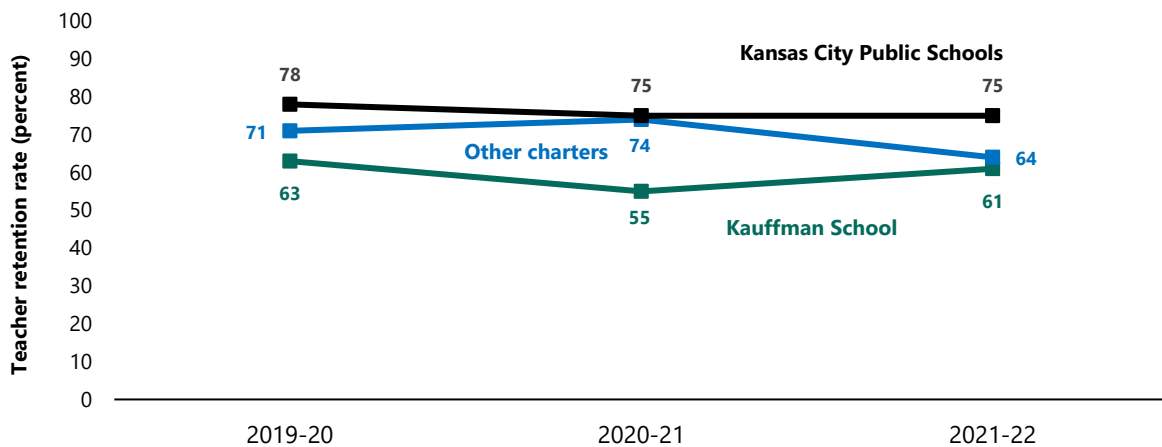
¹¹ Here we compare the Kauffman School only to Kansas City Public Schools, because enrollment data for all other charter schools in Kansas City were not easily accessible from the Missouri DESE website.

VII. Teacher Retention Rates Have Been Stable at The Kauffman School in Recent Years

Teacher retention rates at the Kauffman School have been stable over the past three years. Sixty-one percent of teachers at the Kauffman School in 2021-22 were retained into 2022-23 (Figure VII.1).¹² Though the teacher retention rate at the Kauffman School declined by 8 percentage points between 2019-20 and 2020-21, this change was not statistically significant.

The 61 percent teacher retention rate at the Kauffman School for 2021-22 into 2022-23 was similar to the retention rate of 64 percent at other charter schools in Kansas City. The retention rate is lower than that for Kansas City Public Schools, where 75 percent teachers were retained between 2021-22 and 2022-23. However, higher retention rates within the school district may be expected because transfers across schools within the district count as a teacher being retained.

Figure VII.1. Teacher retention at the Kauffman School is lower than in Kansas City Public Schools and other Kansas City charter schools



Note: Percentages indicate the share of teachers who were employed in the same school district during the following year.

¹² Retention data were obtained from the Missouri DESE Comprehensive Data System, available at <https://apps.dese.mo.gov/HQT/CredentialListerChecker.aspx>. Because charter schools are treated as separate districts in the Missouri data, we calculated the retention rate for other charters by first determining the teacher retention rate within each charter district. We then calculated the average retention rate across all charter districts, weighting by the number of educators employed in each charter district that year.

VIII. Conclusions

The Kauffman School has ambitious academic goals for its students in support of its mission to create college graduates. Although the Kauffman School made substantial progress toward these goals in prior years, it did not achieve these goals during 2020-21, when learning was remote for most of the school year. The Kauffman School's achievement impacts improved during 2021-22 but did not recover to pre-pandemic levels in most grades and subjects.

The Kauffman School had a positive impact on enrollment in four-year colleges. The Kauffman School continued to have a positive impact on four-year college enrollment for its third and fourth cohorts, increasing enrollment by 14 percentage points and 10 percentage points, respectively, relative to comparison students. The effect for the fourth cohort was large enough to close more than 80 percent of the gap in enrollment in four-year colleges for Black high school seniors in Missouri. The Kauffman School did not, however, achieve its goal of 75 percent of graduating seniors attending a four-year college. Impacts on enrollment in both four-year colleges and colleges overall were smaller in 2021 and 2022 than in prior years.

Compared to previous years, the Kauffman School's impact on student achievement growth in 2020-21 was substantially smaller, though it improved in 2021-22. In 2020-21, the differences between learning growth among Kauffman students and comparison students were not statistically significant or educationally meaningful in most grades and subjects. For nearly all grades and subjects in 2020-21, these results meant the Kauffman School fell short of its ambitious goal that, on average, its students will achieve at least 1.25 years of learning growth for each year they are enrolled in the school. In 2021-22, with the improvement in impacts, the Kauffman School came closer to reaching this goal: One-, two-, and three-year impacts for mathematics; three-year impacts for ELA; and one-year impacts in science correspond to at least 1.25 years of learning growth.

Spring ACT scores for 11th-grade Kauffman students fell in 2020-21 and 2021-22 compared to previous years. Decreases in ACT scores meant the Kauffman School fell short of another of its ambitious goals this year—that Kauffman students' average ACT scores would be at the 75th percentile nationally. Based on the highest composite score students achieved across all ACT administrations, Kauffman students' average composite score was at the 48th percentile nationwide for 2020-21 and at the 36th percentile for 2021-22.

The Kauffman School had a positive impact on student attendance. During the 2021-22 school year, Kauffman students' attendance rates were significantly higher than those of comparison students, by approximately 1 percentage point, even while attendance rates declined at the school and across Kansas City. This effect is in line with the Kauffman School's effect on attendance in previous years.

In a departure from prior trends, suspension rates at the Kauffman School were higher than in other Kansas City schools. During the 2021-22 school year, overall suspension rates were significantly higher, by about 12 percentage points, for Kauffman students than for comparison students in other Kansas City schools. This is a change from previous years, over which suspension rates at the Kauffman School had gradually declined to be significantly lower than those of comparison schools.

Fifth-grade enrollment at the Kauffman School has declined. The number of students enrolling in the Kauffman School in 5th grade declined 56 percent from 2019-20 to 2022-23. Over the same period, Kansas City Public Schools experienced a decline of only 10 percent.

Teacher retention at the Kauffman School has been stable in recent years. Sixty-one percent of teachers at the Kauffman School in 2021-22 were retained into 2022-23, which was similar to the retention rate in previous years.

Appendix

A. Background about the Kauffman School

For many years, the Kauffman Foundation has focused on improving education for children in Kansas City. Before opening the Kauffman School, the Kauffman Foundation operated several programs that addressed challenges faced in urban education. Such programs included Project Early (an early childhood program), Project Choice (a program to prevent high school dropout), and the Kauffman Scholars program (a college access and scholarship program). These programs led Foundation leaders to consider the Foundation's possible impact on Kansas City's students through the establishment of a charter school. In March 2009, the Foundation assembled a school design team composed of Foundation education experts and the founding executive director of the Missouri Charter Public School Association.¹³ The team undertook a three-step process of exploration and decision making before establishing the Kauffman School.

Step 1. Analyzing Kansas City's educational landscape. The school design team learned from a review of Kansas City assessment data that during the 2008-09 school year, charter school enrollment accounted for one-third of all public school enrollment in Kansas City (North 2009). The team also found that, among Kansas City's charter and non-charter schools, only 16 percent of middle schools and 7 percent of high schools could claim that at least 50 percent of their students achieved proficient or better on statewide mathematics assessments in 2009 (Richardson 2009).

From the Foundation's perspective, the data suggested that Kansas City's charter and non-charter public schools were struggling to help students achieve, and families might desire alternatives to the city's traditional public schools. In light of students' low academic performance, the Foundation determined that 5th grade was the optimal grade for students to enter its charter school, providing ample time to prepare struggling students for a college preparatory program that would begin in 9th grade.

Step 2. Selecting a location. The Foundation intended that the Kauffman School serve Kansas City's low-income families. From a review of demographic data on Kansas City, the school design team learned that most of the city's low-income population lives in the eastern part of the city, yet most of the city's 23 charter schools were located in the western part. Thus, the Foundation selected a site in the eastern part. Using data on household income by zip code, the design team identified five sections of the city with high concentrations of low-income families. Students living within these five (since expanded to six) zip codes are given first preference for enrollment.¹⁴

In August 2013, the Kauffman School moved to its permanent location. The campus encompasses three buildings: a middle school, a high school, and a gymnasium and cafeteria/commons area. Design elements of the new buildings reflect the Kauffman School's key values and accommodate its core

¹³ The design team was composed of Kauffman Foundation associates, Kauffman Scholars program staff, and consultants from various schools and organizations (Ewing Marion Kauffman Foundation 2010).

¹⁴ The Kauffman School also offers bus transportation for students who live more than 1 mile away from the school, thereby providing access to students in need across the city. During the Kauffman School's second year of operation, the Foundation identified an additional zip code with a high concentration of students from low-income families and offered first preference for enrollment to those students as well.

activities. For example, the new buildings have interior windows to facilitate classroom observations, a central feature of the Kauffman School's professional development model. According to the Kauffman School's website, the interior windows create "an environment that is transparent" and encourage "staff, faculty, parents, and visitors to observe classroom instruction as they walk through the building" (Ewing Marion Kauffman School 2017). The Kauffman School also features teacher workrooms and community spaces for small- and large-group meetings, such as the weekly professional development meetings and community events.

Step 3. Identifying best practices. Before the school opened, the design team made extensive efforts to learn about the best practices of successful charter schools, a process the team described as the "year of learning." The team reviewed research on charter schools and visited successful charter schools in New York, Massachusetts, Illinois, and Wisconsin to learn more about the variables that contributed to their success.

The Kauffman School enrolled its first class of 5th-graders (about 100 students) in fall 2011 and added a second class of 5th-graders (about 100 students) in fall 2012. In fall 2013, a third class of 5th-graders joined the Kauffman School (about 200 students). With the opening of its new campus, the Kauffman School had sufficient capacity to double the size of the cohort entering in 2013. Between 2013-14 and 2019-20, the Kauffman School continued to add a new 5th-grade class of more than 200 students and graduated its first class of high school seniors in spring 2019. Since 2020-21, grade 5 enrollment has dipped below 200 students, reaching a low of 101 5th-grade students in 2022-23 (see Figure VI.1 in the main text).

B. Data preparation details

In this section, we provide details about the data used in our main analysis of the impact of the Kauffman School on student outcomes. We also present a set of descriptive statistics to show how Kauffman students compare to students in other public schools in Kansas City with respect to prior achievement and demographic characteristics. Data for our analyses were available for 11 cohorts of Kauffman students. Cohort I students are those who entered the Kauffman School as 5th-graders in 2011-12 (the year the Kauffman School opened). Each subsequent cohort entered the Kauffman School during the following year, and the most recent cohort of students (Cohort XI) entered in 2021-22.

1. Test score and student characteristic data

The Missouri Department of Elementary and Secondary Education (DESE) provided data on the results from its state assessment and student characteristics for all students enrolled in Missouri public schools from 2007-08 through 2021-22. The state assessment data include Missouri Assessment Program (MAP) scores, proficiency levels, and information on test accommodations for each student by year, grade level, and content area. The data on student characteristics include information on demographic characteristics, free or reduced-price lunch status, limited English proficiency, disability, attendance, and disciplinary information for each student by year and school in which they were enrolled. School-level characteristics, such as charter school classification and location, are also included. Except for data redacted by DESE, the data include student-level data for all Missouri students. In the next section, we provide details about DESE's data-redacting process.

To link the state assessment and student characteristics data, we reduced both to the student level. From the assessment data, we removed records in which students had more than one unique subject-specific MAP score or end-of-course (EOC) scaled score reported in a given year. Each year, there are three administration windows—in the fall, spring, and summer—for EOC exams. A large majority of students take these exams in the spring, so we used the spring score if available. If a student had no spring score, we used that student's fall score. In prior years, if neither spring nor fall scores were available, we used the score from the summer administration. For the 2017-18 summer administration, however, the scores were on a different scale from tests taken in the fall and spring, so we removed those scores from our analysis. DESE did not provide us with scores for EOC exams taken during summer 2019 or 2021.

From the characteristics data, we first removed all records with zero or missing reported attendance and then summed attendance and disciplinary variables across each student's school-specific records to calculate student-year totals. We then reduced the data to the student level so all year-specific attendance or disciplinary information was preserved in separate variables. Demographic information, free or reduced-price lunch status, limited English proficiency, and disability information were taken from the student's 4th-grade record if available; from the next closest earlier grade if the 4th-grade record was not available; and from the 5th-grade record if no information from kindergarten through 4th grade was available.¹⁵ Students not found in both the assessment and the characteristics data files were dropped from the analysis.

To facilitate the analyses, we created several new variables using these data. We transformed student MAP and EOC scaled scores into z-scores based on statewide year-, grade-, and subject-specific means and standard deviations.¹⁶ We also used information on enrollment and absences to create a measure of the attendance rate that we bottom-coded at the year-specific first percentile to remove extreme outliers. We used disciplinary information to create yearly indicators of whether students were suspended that year.¹⁷ We then collapsed subject-specific 3rd- and 4th-grade MAP z-scores into grade-specific variables by taking each student's most recent score (by year) within the grade level for students who repeated 3rd or 4th grade. We created a single binary indicator for test accommodations to represent having test accommodations on any 3rd- or 4th-grade MAP test.

For many students, data on one or more of the variables used as baseline controls were missing. About 15 percent of the students who could potentially be included in our analysis sample were missing data on one or more of the baseline control variables. Instead of dropping them from the analysis, we used a

¹⁵ Starting with Cohort V Kauffman and comparison students, all information about free lunch status comes from earlier than 4th grade. This is because beginning in 2014-15, Kansas City Public Schools participated in the Community Eligibility Provision meal service option, and free or reduced-price lunch status was not tracked in subsequent years. Because some Kansas City students may have transferred into the district after tracking of free or reduced-price lunch status ended, for most cohorts of students, we imputed missing information on free lunch status in cases where it was not available in any earlier grade. However, starting with Cohort IX 5th-grade students, we excluded the free or reduced-price lunch variable from the analysis rather than imputing missing data because almost all of the comparison students had enrolled in Kansas City Public Schools for the first time after the district stopped tracking lunch status information.

¹⁶ DESE sent us separate non-redacted but completely de-identified data that we used to calculate the statewide means and standard deviations.

¹⁷ We used 4th-grade attendance and suspensions as control variables in all analyses. If 4th-grade information on these variables was missing, we used 3rd-grade values instead.

multiple imputation procedure to estimate their missing baseline values (see the next section, “Methods,” for details). As a robustness check, we analyzed the data without using imputation and found similar results. (Results are available upon request.)

When a student repeats a grade (in grade 5 or later), another missing-data problem for the analysis arises because that student no longer takes the same outcome assessment as the rest of the students in their original cohort. We followed the method used in Tuttle et al. (2013) for dealing with missing outcome scores for repeaters, which involves assuming that the relative rank in the district test score distribution does not change after the first time the repeater completed their previous grade. We used this method for both Kauffman students and comparison students who repeated a grade. For example, students who repeat 5th grade are included, along with other students from their same cohort in the two-, three-, and four-year impact estimates, with the z-scores of the repeater students fixed at their end-of-5th-grade values. Similarly, students who repeated grades 5, 6, or 7 were missing 8th-grade science scores at the time we analyzed their cohort’s four-year science impacts. We therefore substituted 5th-grade science z-scores for these students in our main analysis.

In prior years, the Kauffman School’s positive impacts on student achievement meant that this assumption about the test scores of repeaters likely understated the two-, three-, and four-year impact estimates because our method for including repeaters assumes the Kauffman School has no effect on these students during their subsequent years of enrollment. Johnson et al. (2016) showed that excluding grade repeaters leads to small increases in the Kauffman School impact estimates.

Note that student grade repetition does not pose a problem for the EOC analyses because those exams are given to students in multiple grades. The analysis therefore does not depend on students taking the exam at the same time as other students in their cohort. For example, Cohort III Kauffman students who repeated a grade at some point were not included in the 2017-18 EOC analysis because they were 8th-graders in that year and did not take the EOC exams that 9th-grade Kauffman students did. When these students progressed into 9th grade in 2018-19 and took the EOC exams, they were included in the 2018-19 analysis.

2. High school graduation and college enrollment data

DESE provided high school graduation data that were based on students still enrolled in public schools in Missouri during the 2020-21 and 2021-22 school years. Because we could not distinguish among students who transferred to an out-of-state school, students who are missing from the data due to DESE’s redacting process, and students who dropped out of school before their expected graduation date, we excluded students not present in the 2020-21 or 2021-22 school year from our analyses of high school graduation and college enrollment.

College enrollment data were based on DESE’s six-month student graduate follow-up file.¹⁸ These data track the status of each high school graduate six months after graduation. DESE’s data collection process

¹⁸ For most analyses, we used the six-month follow-up file we received from DESE that includes all high school graduates in Missouri except for those removed through DESE’s data-redacting process. To calculate the rate of enrollment in four-year colleges for Kauffman School graduates, we used a non-redacted version of the six-month follow-up file we received from the Kauffman School, which included only Kauffman students.

starts with a query to the StudentTracker service from the National Student Clearinghouse (NSC) to identify graduates enrolled in an NSC-participating college (approximately 97 percent of college students nationwide and 96 percent in Missouri).¹⁹ These data are then sent to the districts from which the student graduated, and the districts then have the opportunity to update the follow-up status based on information they have about their graduates.²⁰

As a quality check for these data for the first two cohorts of Kauffman students, we submitted a separate data request to the NSC for its college enrollment history, using name and date-of-birth information obtained from the Kauffman School. We then compared each student's status—attendance at a four-year college, attendance at a two-year college, or not attending college—between that data request and the reported six-month follow-up data obtained from the Kauffman School for the same Kauffman students.

Of the 75 students whose data we sent to the NSC for matching across the first two cohorts of Kauffman School graduates, five students did not appear in the NSC data but appeared in the six-month follow-up report as attending a four-year college. In addition, one student was classified as enrolled in a two-year college in the NSC data but was enrolled in a four-year college based on the six-month follow-up file. These discrepancies may result from the Kauffman School being able to capture additional information through direct follow-up with students missing from the NSC data due to administrative data issues that cause a student not to match NSC records (for example, typos in student name or date of birth, gaps in NSC coverage, or students opting out of allowing the NSC to release their data). If other schools in Kansas City are as good at tracking the status of their high school graduates as the Kauffman School, any discrepancies between the six-month graduate follow-up file and the NSC data would not have an effect on the college enrollment impact estimates in this report. However, if the Kauffman School does a better job of tracking the status of its graduates, these discrepancies could lead to an upward bias in the impact estimates.

Similar to the EOC analyses, student grade repetition does not pose a problem for the high school graduation and college enrollment analyses. These analyses measure graduation and college enrollment rates using the expected high school graduation date for students from the same 5th-grade cohort. Grade repeaters who did not graduate from high school on time are counted as not having graduated high school or enrolled in college for the purposes of these analyses.

3. DESE's data redacting process

Starting with data requests filled in 2016, DESE began redacting observations in which some combination of student demographic or proficiency information could identify a group with fewer than five students in a particular grade and school district. The new redacting policy led to the removal of 10 to 30 Kauffman students from each cohort. DESE removed a larger proportion of students from the first two cohorts because the starting sample in 5th grade was only about 100 students for Cohorts I and II, whereas later cohorts had more than 200 students.

¹⁹ NSC coverage rates are fall 2019 rates for all Title IV degree-granting institutions, from the NSC's Enrollment Coverage Workbook, available at https://nscresearchcenter.org/wp-content/uploads/NSC_COVERAGE.xlsx.

²⁰ Valid statuses include attending a four-year college, attending a two-year college, attending some other postsecondary school, competitively employed, otherwise employed, in the military, other status, and unknown.

4. *Issues with Algebra I, Biology, and English II EOC exam scores during some years*

During 2016-17, the Algebra I and English II EOC exams experienced a statewide problem, such that the scores and proficiency levels were not comparable to those of previous years. However, the scores continued to provide a valid within-year comparison across students taking the exam in 2016-17. Ultimately, DESE decided not to use the achievement levels on these two exams for accountability purposes in 2016-17. We thus excluded these data from our proficiency rate calculations in the sections in this appendix titled “Methods” and “Additional proficiency rate calculations.” We did include these scores to calculate impacts, however, because the comparison groups for those analyses consist only of students taking EOC exams in the same year.

During 2017-18, DESE field tested new 4th- and 8th-grade science exams as well as a new Biology EOC exam. These exams were administered but not used for accountability purposes during 2017-18, and no science scores were released to students or schools.

The majority of students in Missouri take the English II EOC exam in 10th grade, whereas both 9th- and 10th-grade students at the Kauffman School took this exam in 2016-17, and only 9th-grade Kauffman students took the exam in 2017-18. During 2018-19, no 9th-grade Kauffman students took the English II EOC exam, likely because those students were waiting until 10th grade to take it (however, the test was canceled in 2019-20 due to the COVID-19 pandemic).

During 2020-21, 10th-grade Kauffman students took the English II EOC, and the Kauffman School did not administer the Algebra I or Biology EOC exams. During 2021-22, 9th-grade Kauffman students took the Biology EOC exam, 10th-grade Kauffman students took Algebra, Biology, and English II EOC exams, and 12th-grade Kauffman students took the Government EOC exam.

5. *Sample selection*

The main results in this report are based on a matched comparison group selected from all students attending schools within the borders of the Kansas City Public School system, including other charter schools. The impact estimates thus can be interpreted as how much more or less likely a Kansas City student would be to graduate from high school on time and enroll in college if the student were to enroll in the Kauffman School rather than in a typical Kansas City school. However, given the considerable number of charter schools serving students in the Kansas City area, a comparison of the Kauffman School’s impacts on student outcomes to those of other Kansas City charter schools might also be of interest. Thus, we report our results in three ways. We use comparison groups of students from (1) all public schools in Kansas City (the primary impact estimates), (2) district-operated (non-charter) Kansas City public schools only, and (3) other charter schools within Kansas City only.

The *Kauffman School group* is composed of students who were enrolled in the Kauffman School in 5th grade in any year from 2011-12 through 2021-22 for at least part of the school year.²¹ The *Kansas City*

²¹ In 2014-15, the Kauffman School began accepting new students in grades 6 and higher who were not previously enrolled in the school in 5th grade, such that approximately 4 percent of students in these grades were backfilled. We excluded backfilled students from our analysis because the amount of time they spent at the Kauffman School is not comparable to that of other students in the same grade. Some 5th-grade students were also enrolled in the school

district schools comparison group is composed of students enrolled in the Kansas City public schools district in 5th grade in our analysis years for at least part of the school year and not included in the Kauffman School group. The *Kansas City charter schools* comparison group includes only those students enrolled in 5th grade for all or part of the school year in our analysis years in a Kansas City charter school other than the Kauffman School. The *all Kansas City public schools* comparison group includes all students in either of the two comparison groups.

We excluded Kauffman and comparison students who were missing all outcome test scores and all 3rd- and 4th-grade MAP test scores.²²

6. *Descriptive statistics: What types of students attend the Kauffman School?*

Kauffman students differed significantly from students enrolled in Kansas City public schools on several baseline measures.²³ For example, Kauffman students were more likely to be Black, less likely to be Hispanic, and less likely to be English language learners than students in other Kansas City schools. Table A.1 shows the baseline average characteristics of all students in the Kauffman School for the most recent cohort (Cohort XI) and other students in Kansas City.²⁴

midyear. We included these students in the analysis because they spent part of their 5th-grade year at the Kauffman School.

²² We generally kept students who transferred to different school districts in Missouri in our sample but excluded students who left the state because their test scores, attendance, and suspension outcome measures would be missing.

²³ Characteristics for which there is a small percentage of Kauffman students in our sample (such as English language learner) may not be representative of the Kauffman School overall because of DESE's data redacting policy. See Johnson et al. (2016) for baseline characteristics of earlier cohorts of Kauffman students before the redacting policy was enacted.

²⁴ See Johnson and Demers (2021) for baseline characteristics of students from Cohort IX.

Table A.1. Baseline 4th-grade average characteristics of Kauffman students and other Kansas City public school students: Cohort XI 5th-graders

	Kauffman School	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
4th-grade mathematics scaled score	330	336	336	335
4th-grade ELA scaled score	353	355	352	358
Black	0.94	0.52**	0.50**	0.55**
Hispanic	0.05	0.29**	0.33**	0.24**
English language learner	0.02	0.26**	0.29**	0.22**
Male	0.48	0.48	0.49	0.46
Has a disability	0.08	0.06	0.08	0.04
Any baseline test accommodation	0.00	0.02**	0.03**	0.02**
4th-grade attendance rate	0.94	0.95*	0.95*	0.95*
4th-grade ever suspended	0.15	0.07*	0.08*	0.06*
Sample size	84	1,370	814	565

Note: This table does not include a row for free or reduced-price lunch status because comparison students in this cohort first enrolled in Kansas City public schools after the district stopped collecting information on lunch status.

* Significantly different from Kauffman students at the 5 percent level.

** Significantly different from Kauffman students at the 1 percent level.

C. Methods

In this section, we provide details about our analysis methodology, including information about our propensity score matching and imputation procedures.

1. Comparing Kauffman students to students from other Kansas City schools

Given that all Kauffman students have chosen to enroll in the Kauffman School, they might differ from other Kansas City students in important ways. Thus, any effort to measure the effect of the Kauffman School on student achievement requires identifying a comparison group of Kansas City students who, as of 4th grade (before the Kauffman School’s 5th-grade entry year), are similar to students about to enter the Kauffman School. Otherwise, any differences we find in later student outcomes might not be attributable to the effect of the Kauffman School.

To guarantee that the comparison group is similar, the gold standard research design would require a lottery in which some of the students who apply to the Kauffman School are randomly selected to attend the school and others are randomly denied acceptance. We could then fairly compare the achievement of the two randomly established groups and assume that any naturally occurring differences among students would be randomly distributed between the two groups. However, the Kauffman School has not been oversubscribed enough to turn away large numbers of applicants; thus, we cannot adopt this research design. Instead, we turned to the next best approach. We used data from students across Kansas City to identify a matched comparison group of students who were similar to Kauffman students in 4th grade, immediately before Kauffman students enrolled in the school.

To construct a comparison group of students, we implemented a propensity score matching procedure. We matched students attending other schools in Kansas City to Kauffman students based on

characteristics, including prior test scores, prior attendance, prior suspensions, and demographic characteristics. This approach is a commonly used alternative when random assignment is not possible. In fact, research has shown that the propensity score matching procedure can produce valid impact estimates that replicate the results of experimental research designs in the context of charter school evaluation (Tuttle et al. 2013; Gill et al. 2015).

2. *Constituting the Kauffman student group*

Throughout our analysis, we classified any student enrolled in the Kauffman School for at least part of the student's 5th-grade year as a Kauffman student. Classifying students in this manner defuses the potential criticism that any positive estimates of the Kauffman School's effects would be overestimated because low-achieving students have left the charter school. However, including these students might have led to an understatement of the positive impact of the Kauffman School on student achievement observed in prior years, as those who left the Kauffman School early would not have experienced its full impact. This analytic approach eliminates the risk of overestimating any positive impacts and means that the prior years' positive estimates of the full impact on students who continue in the Kauffman School for additional years were likely to be underestimated. For 2020-21, in cases where negative impacts were observed, this approach would have the opposite effect.

We present test score impact estimates by the number of years that have elapsed since students first enrolled in the Kauffman School. The five-year impacts are based on scores on the Biology EOC exam that students took in 9th grade. The six-year impacts are based on scores on the Algebra, English II EOC, and Biology exams that Kauffman students took in 10th grade. The eight-year impacts are based on scores on the Government EOC exam taken in 12th grade. However, students in any grade may be included in the EOC exam analysis as long as they are taking the exam for the first time.

In contrast to the separate results for the 2020-21 school year, the main impact estimates from prior years reflect the average effect of the Kauffman School across all cohorts with available data.

3. *Multiple imputation methodology*

We calculated impact estimates by using a multiple imputation procedure with $M = 10$ imputed data sets. We imputed values for missing baseline outcome variables separately by treatment or comparison status by using a chained linear equations model that included all outcome and student characteristic variables in the final impact regressions. Results that excluded imputed data and limited the sample to students for whom all data were nonmissing are available upon request.

We excluded students from the imputation model if they had missing data for all 3rd- or 4th-grade MAP test scores or missing data for any outcomes. For 5th-grade students in 2020-21, all 4th-grade MAP test scores were missing because the exam was canceled in the 2019-20 school year due to the COVID-19 pandemic. We therefore excluded 4th-grade baseline test scores from the 5th-grade analysis and used only 3rd-grade baseline scores. We imputed missing values before both propensity score matching and regression analyses in each multiple imputation data set.

After collecting coefficient and standard error estimates from each of the 10 imputed data sets, we computed multiple imputation coefficients and standard errors by using Rubin's combination method

(Rubin 1987). The multiple imputation beta (β_M) coefficient is the average of the beta coefficient values in each imputed data set (β_m); the multiple imputation standard error is the square root of the within-imputation coefficient variance (Var_W) plus the between-imputation coefficient variance (Var_B) inflated by a finite imputation correction multiplier:

$$(1) SE_M = \sqrt{Var_W + \left(1 + \frac{1}{M}\right) Var_B} = \sqrt{\left(\frac{\sum_{m=1}^M Var_m}{M}\right) + \left(1 + \frac{1}{M}\right) \left(\frac{\sum_{m=1}^M (\beta_m - \beta_M)^2}{M-1}\right)}$$

4. *Missing 8th-grade mathematics MAP scores*

Approximately one-quarter of 8th-grade students outside of the Kauffman School took the Algebra I EOC exam instead of the 8th-grade mathematics MAP exam. We imputed the missing 8th-grade mathematics MAP test scores for these students by using their 8th-grade ELA and science MAP test scores, 7th-grade ELA and mathematics MAP test scores, 8th-grade attendance and suspension data, and the same set of student baseline characteristic variables included in the other imputations.

The four-year mathematics impact estimate should be interpreted with caution because the imputation procedure may not provide an accurate estimate of these students' 8th-grade mathematics scores. This situation could occur if advanced students who were likely to do well in mathematics chose to take Algebra I instead of 8th-grade mathematics and this aptitude for mathematics was not fully captured in the student's 7th-grade mathematics or other test scores. If true, this unobserved characteristic would cause an upward bias in our estimate of the Kauffman School's impact on 8th-grade mathematics scores.

5. *Propensity score matching methodology*

We estimated a propensity score for each eligible treatment and comparison student in each multiple imputation data set using a stepwise logistic regression model. We used an entry criterion of $p < .20$ to determine whether each variable would enter the final logistic regression model. (See Table A.2 for a list of the variables.)

As a result of the data-redacting process, in some cohorts we removed all Kauffman students with a certain characteristic from the data. For example, we reacted from the data all Cohort I Kauffman students who were English language learners. In such cases, we dropped all comparison students with this characteristic from the data before the matching.

Table A.2. Potential covariates used for propensity score matching

4th-grade mathematics and ELA MAP z-scores
Second- and third-order polynomials of 4th-grade mathematics and ELA MAP z-scores
3rd-grade mathematics and ELA MAP z-scores
4th-grade attendance rate and ever-suspended variables
Gender, race/ethnicity, individualized education program, English language learner, free or reduced-price lunch, any baseline test accommodation
Indicators for imputed 3rd- and 4th-grade mathematics and ELA MAP z-score variables
Indicator for imputed 4th-grade attendance rate or ever-suspended variables

Note: We did not include free or reduced-price lunch status as a covariate starting with Cohort IX 5th-graders because comparison students in this cohort first enrolled in Kansas City public schools after the district stopped collecting lunch status information. We did not use 3rd-grade MAP scores as baseline variables for Cohort XI 5th-graders because MAP assessments were not administered due to the COVID-19 pandemic.

After generating propensity scores for each Kauffman student and each eligible comparison student, we selected a matched comparison group by finding comparison students with propensity scores within a given threshold, or radius, from each Kauffman student’s propensity score. We sampled comparison students with replacement, which means that we could match each comparison student to multiple Kauffman students. To limit the number of possible comparison students, we specified a minimum matching radius and maximum number of potential matched neighbors.²⁵ Because district students differed more from Kauffman students on baseline characteristics relative to the other two groups, we made the matching radius larger for the district comparison group. This change was necessary to prevent the samples of the Kauffman and matched comparison students from being too small. If no comparison students were within the matching radius for a given treatment student, we excluded that student from the matched comparison impact analyses. We used a weighting scheme in which each treatment student had a weight of 1 and each comparison student was weighted according to the number of matching treatment students. Table A.3 shows a summary of matching information from the 2021-22 school year for each comparison group.²⁶

²⁵ For each analysis, the matching radius was 0.0012 for the all-Kansas City comparison group; it was 0.0022 for the district comparison group and 0.0018 for the charter comparison group. The maximum number of potential matched neighbors was 20.

²⁶ For the grade/cohort combinations from earlier years, see Johnson and Demers (2021).

Table A.3. Matching information summary for the 2021-22 analysis

	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
Government EOC analysis (12th grade)			
Number of Kauffman students	136	136	136
Mean number of Kauffman students matched	129	119	117
Mean number of comparison students	482	291	217
Mean matches per Kauffman student	7.3	4.5	3.7
Cohort IV 12th-graders (high school graduation and college analyses)			
Number of Kauffman students	130	130	130
Mean number of Kauffman students matched	124	105	109
Mean number of comparison students	444	246	211
Mean matches per Kauffman student	6.1	3.6	4.0
Cohort V 11th-graders (attendance and suspensions)			
Number of Kauffman students	139	139	139
Mean number of Kauffman students matched	131	128	117
Mean number of comparison students	591	404	226
Mean matches per Kauffman student	7.8	5.6	3.2
Algebra EOC analysis (10th grade)			
Number of Kauffman students	129	129	129
Mean number of Kauffman students matched	115	107	103
Mean number of comparison students	378	222	180
Mean matches per Kauffman student	6.3	4.4	2.9
English II EOC analysis (10th grade)			
Number of Kauffman students	129	129	129
Mean number of Kauffman students matched	122	114	116
Mean number of comparison students	494	242	249
Mean matches per Kauffman student	12.6	5.4	11.4
Biology EOC analysis (10th grade)			
Number of Kauffman students	130	130	130
Mean number of Kauffman students matched	122	115	109
Mean number of comparison students	448	226	209
Mean matches per Kauffman student	8.8	4.1	4.8
Cohort VI 10th-graders (attendance and suspensions)			
Number of Kauffman students	140	140	140
Mean number of Kauffman students matched	138	134	123
Mean number of comparison students	621	340	277
Mean matches per Kauffman student	11.8	5.7	5.5
Biology EOC analysis (9th grade)			
Number of Kauffman students	142	142	142
Mean number of Kauffman students matched	122	112	116

	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
Mean number of comparison students	468	239	257
Mean matches per Kauffman student	9.9	4.1	10.4
Cohort VII 9th-graders (attendance and suspensions)			
Number of Kauffman students	157	157	157
Mean number of Kauffman students matched	151	150	132
Mean number of comparison students	689	438	235
Mean matches per Kauffman student	11.9	6.6	4.1
Cohort VIII 8th-graders (all analyses)			
Number of Kauffman students	167	167	167
Mean number of Kauffman students matched	162	159	141
Mean number of comparison students	787	512	302
Mean matches per Kauffman student	12.6	8.0	4.0
Cohort IX 7th-graders (all analyses)			
Number of Kauffman students	155	155	155
Mean number of Kauffman students matched	153	150	141
Mean number of comparison students	851	529	381
Mean matches per Kauffman student	16.8	14.5	5.9
Cohort X 6th-graders (all analyses)			
Number of Kauffman students	118	118	118
Mean number of Kauffman students matched	115	110	110
Mean number of comparison students	678	434	348
Mean matches per Kauffman student	14.0	8.2	11.7
Cohort XI 5th-graders (all analyses)			
Number of Kauffman students	84	84	84
Mean number of Kauffman students matched	78	74	67
Mean number of comparison students	519	342	238
Mean matches per Kauffman student	11.4	10.1	5.7

Table A.4 presents summary statistics to show how well Kauffman students were matched to comparison students on baseline characteristics.²⁷ On average, comparison students from each matched group were not significantly different from Kauffman students on any baseline characteristic used in the analysis.

²⁷ The composition of each group of Kauffman students differs slightly from one matched comparison group analysis to the next, depending on the comparison group. Table A.4 shows the averages for the Kauffman students included in the main analysis, in which the comparison group includes all Kansas City public schools.

Table A.4. Baseline 4th-grade average characteristics of matched comparison samples for the 2020-21 analysis

	Kauffman School	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
Cohort IV 12th-graders				
4th-grade mathematics scaled score	633	633	632	631
4th-grade ELA scaled score	647	647	646	648
Free or reduced-price lunch	0.96	0.95	0.96	0.96
Black	0.92	0.92	0.91	0.93
Hispanic	0.04	0.05	0.05	0.05
English language learner	0.02	0.02	0.03	0.03*
Male	0.41	0.45	0.44	0.38
Has a disability	0.05	0.05	0.05	0.01
Any prior test accommodation	0.05	0.05	0.06	0.05
4th-grade attendance rate	0.96	0.96	0.96	0.96
4th-grade ever suspended	0.19	0.20	0.18	0.17
Sample size	124	444	246	211
Cohort V 11th-graders				
4th-grade mathematics scaled score	2446	2447	2445	2438
4th-grade ELA scaled score	2452	2453	2448	2445
Free or reduced-price lunch	0.95	0.95	0.95	0.96
Black	0.91	0.90	0.91	0.92
Hispanic	0.05	0.04	0.06	0.04
English language learner	0.02	0.03	0.03	0.05
Male	0.44	0.48	0.47	0.37
Has a disability	0.08	0.08	0.08	0.04
Any prior test accommodation	0.10	0.12	0.10	0.05
4th-grade attendance rate	0.95	0.95	0.95	0.95
4th-grade ever suspended	0.16	0.17	0.15	0.18
Sample size	131	591	404	226
Cohort VI 10th-graders				
4th-grade mathematics scaled score	450	450	447	457
4th-grade ELA scaled score	461	459	459	463
Free or reduced-price lunch	0.94	0.94	0.95	0.92
Black	0.96	0.97	0.96	0.97
Hispanic	0.01	0.01	0.01	0.01
English language learner	0.00	0.00	0.00	0.00
Male	0.43	0.48	0.45	0.46
Has a disability	0.03	0.03	0.03	0.03

	Kauffman School	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
Any prior test accommodation	0.01	0.02	0.02	0.01
4th-grade attendance rate	0.96	0.96	0.96	0.95
4th-grade ever suspended	0.21	0.20	0.18	0.26
Sample size	138	621	340	277
Cohort VII 9th-graders				
4th-grade mathematics scaled score	442	443	441	449
4th-grade ELA scaled score	458	458	456	462
Free or reduced-price lunch	0.93	0.94	0.94	0.93
Black	0.95	0.95	0.95	0.95
Hispanic	0.00	0.00	0.00	0.00
English language learner	0.01	0.01	0.01	0.00
Male	0.45	0.48	0.46	0.44
Has a disability	0.07	0.08	0.07	0.00
Any prior test accommodation	0.35	0.37	0.37	0.29
4th-grade attendance rate	0.95	0.95	0.95	0.95
4th-grade ever suspended	0.19	0.21	0.20	0.18
Sample size	151	689	438	235
Cohort VIII 8th-graders				
4th-grade mathematics scaled score	356	354	353	362
4th-grade ELA scaled score	365	364	363	368
Free or reduced-price lunch	0.96	0.96	0.95	0.96
Black	0.90	0.91	0.91	0.90
Hispanic	0.04	0.05	0.05	0.05
English language learner	0.04	0.04	0.04	0.06
Male	0.46	0.46	0.47	0.48
Has a disability	0.06	0.08	0.05	0.04
Any prior test accommodation	0.37	0.38	0.42	0.33
4th-grade attendance rate	0.95	0.95	0.94	0.95
4th-grade ever suspended	0.18	0.18	0.21	0.17
Sample size	162	787	512	302
Cohort IX 7th-graders				
4th-grade mathematics scaled score	355	353	354	360
4th-grade ELA scaled score	361	361	361	363
Free or reduced-price lunch	n/a	n/a	n/a	n/a
Black	0.91	0.91	0.90	0.91
Hispanic	0.06	0.06	0.07	0.06
English language learner	0.04	0.04	0.05	0.05

	Kauffman School	All Kansas City public schools	Kansas City district schools	Kansas City charter schools
Male	0.50	0.48	0.53	0.46
Has a disability	0.10	0.08	0.08	0.06
Any prior test accommodation	0.03	0.04	0.03	0.03
4th-grade attendance rate	0.94	0.94	0.94	0.94
4th-grade ever suspended	0.14	0.15	0.16	0.14
Sample size	153	851	529	381
Cohort X 6th-graders				
3rd-grade mathematics scaled score	335	336	334	337
3rd-grade ELA scaled score	339	338	338	339
Free or reduced-price lunch	n/a	n/a	n/a	n/a
Black	0.92	0.93	0.93	0.93
Hispanic	0.04	0.04	0.04	0.03
English language learner	0.02	0.03	0.03	0.02
Male	0.57	0.51	0.52	0.57
Has a disability	0.06	0.06	0.08	0.05
Any prior test accommodation	0.00	0.00	0.00	0.00
4th-grade attendance rate	0.94	0.94	0.94	0.94
4th-grade ever suspended	0.22	0.20	0.17	0.18
Sample size	115	678	434	348
Cohort XI 5th-graders				
4th-grade mathematics scaled score	331	331	329	332
4th-grade ELA scaled score	354	354	351	356
Free or reduced-price lunch	n/a	n/a	n/a	n/a
Black	0.94	0.94	0.93	0.94
Hispanic	0.05	0.04	0.04	0.04
English language learner	0.03	0.02	0.02	0.03
Male	0.45	0.45	0.46	0.43
Has a disability	0.05	0.06	0.06	0.00
Any prior test accommodation	0.00	0.00	0.00	0.00
3rd-grade attendance rate	0.94	0.94	0.94	0.94
3rd-grade ever suspended	0.14	0.12	0.13	0.07
Sample size	78	519	342	238

Note: Free or reduced-price lunch status is not included for Cohort IX 7th-graders, Cohort X 6th-graders, and Cohort XI 5th-graders because comparison students in these cohorts first enrolled in Kansas City public schools after the district stopped collecting lunch status information. The Kauffman characteristics and sample size represent the total number of Kauffman students matched to the full comparison group of students from all Kansas City public schools. No differences between averages for Kauffman students and comparison group students are significantly different from zero.

6. *Estimating impacts of the Kauffman School on specific groups of students*

Using the same set of Kauffman and citywide matched comparison students described above, we estimated whether the Kauffman School had different impacts on different groups of students. Specifically, we tested whether the impacts of the Kauffman School varied for students who are male, Hispanic, or identified as another race besides Black or Hispanic compared to their counterparts. In addition, we tested whether the impacts differed for students who had lower achievement on baseline MAP tests compared to peers who had relatively higher levels of baseline achievement. We defined low baseline achievement as scoring at the basic or below basic proficiency level on both the mathematics and ELA MAP exams taken in the spring before students entered the Kauffman School (that is, in 4th grade). Low-achieving students in 5th grade in 2020-21 were identified based on achievement in 3rd grade, as no 4th-grade baseline scores were available from 2019-20 due to the pandemic.

For each group of interest, we repeated our benchmark impact regression model, adding an interaction term to the model, where the coefficient of the interaction term represents how the impact of the Kauffman School differs for the group of interest (for example, whether the student was low performing at baseline). One model was used to jointly estimate whether the Kauffman School's impact differed based on student race and ethnicity. This model included an interaction term between treatment status and the Hispanic indicator, as well as an interaction term between the treatment indicator and the other race indicator. The category of Black students was omitted in the regression, such that the coefficients on the interaction terms represent the difference in impact on Hispanic and other race students compared to Black students.

Following the procedures used in our main analyses, we collected and averaged coefficient and standard error estimates on each interaction term from each of the 10 imputed data sets. For the impacts on MAP test scores, we created one subject-level group impact by averaging the results across grade levels, weighting by the number of Kauffman students in the analysis in each grade level. To avoid including imprecise results in the average, we only included cohort-year-level results that were based on five or more Kauffman students in the analytic sample. These group impact findings are presented in Tables A.6 and A.8 in Section D.

D. Additional impact estimates

This section describes the Kauffman School impact estimates for college enrollment and high school graduation, both for the main analysis sample and separately for the district and charter comparison groups. We then report the test score impacts in effect-size units separately for the same comparison groups. Following that, we provide additional details about the conversion of effect-size estimates to years of additional learning growth.

1. *Impacts on college enrollment and high school graduation*

The impact estimates for the Kauffman School on college enrollment and high school graduation for its fourth cohort (who entered the school in 5th grade in 2014-15 and whose expected graduation was in May 2022) are shown in Table A.5, separately for the main citywide comparison group, as well as the

district and charter comparison groups.²⁸ The results are based on regression models that include the Kauffman students and matched comparison students, and they control for small remaining differences in prior achievement and other baseline characteristics.²⁹ As noted previously, any student enrolled in the Kauffman School as a 5th-grader for at least part of the school year is included in the Kauffman group for all impact estimates. These estimates thus should be interpreted as the average effect of enrolling in the Kauffman School, accounting for the possibility that students might leave.

Table A.5. Impact of Kauffman School on college enrollment and high school graduation for fourth cohort of Kauffman School students

	Citywide comparison group	Compared to Kansas City district schools	Compared to Kansas City charter schools
Enrollment in four-year colleges	0.10 (0.05)	0.11 (0.06)	0.12 (0.06)
Enrollment in any college	0.09 (0.05)	0.09 (0.07)	0.10 (0.06)
High school graduation	0.00 (0.04)	0.00 (0.05)	-0.01 (0.05)
Sample size	578	326	322

Note: This table shows impacts of the Kauffman School in percentage point units. Standard errors are shown in parentheses below each impact estimate. The sample sizes represent the total number of Kauffman and matched comparison students in each analysis.

2. Impacts on college enrollment and high school graduation by student group

Table A.6 shows the group impact estimates, averaged across 2020-21 and 2021-22, for the Kauffman School on college enrollment and high school graduation. The first column represents the differential impact of the Kauffman School on students who had low baseline achievement prior to entering the 5th grade, compared to their relatively higher-achieving peers. The second column represents the differential impact on male students compared to female students. Separate impacts by race and ethnicity are not reported in this table, because the impact calculations for college enrollment and high school graduation included fewer than 10 Kauffman students who were Hispanic or identified as another race.

²⁸ Results for previous cohorts of Kauffman students are available upon request.

²⁹ Table A.2 lists the variables included in the model.

Table A.6. Average differential impact of Kauffman School on college enrollment and high school graduation for students who had low baseline achievement and students who were male (citywide comparison group)

	Low baseline achievement	Male
Enrollment in four-year colleges	0.06 (0.08)	-0.05 (0.08)
Enrollment in any college	0.03 (0.08)	0.00 (0.08)
High school graduation	-0.09 (0.07)	0.05 (0.06)
Group sample size	132	94

Note: This table shows the impacts of the Kauffman School, averaged across 2020-21 and 2021-22, on specific groups of students in percentage point units. Standard errors are shown in parentheses below each impact estimate. The group sample sizes represent the total number of Kauffman students in the relevant group in each analysis. Cohort-year-level impacts for groups with fewer than five students in the analysis were excluded from the average impact. Impacts for groups that included fewer than 10 Kauffman students are excluded from the table.

3. Impacts on state test scores

Table A.7 shows the 2021-22 impact estimates for the Kauffman School on student achievement in each subject and enrollment duration.³⁰ The results are shown in effect-size units, which can be interpreted as the number of test score standard deviations higher or lower performed by Kauffman students relative to students in the comparison groups.³¹

³⁰ Results for previous cohorts of Kauffman students are available upon request.

³¹ During the 2021-22 school year, the statewide standard deviations of 8th-grade MAP scores were 53 in mathematics, 41 in ELA, and 40 in science; of 7th-grade MAP scores, standard deviations were 46 in mathematics and 40 in ELA; of 6th-grade MAP scores, they were 39 in mathematics and 35 in ELA; and of 5th-grade MAP scores, they were 42 in mathematics, 43 in ELA, and 40 in science. The statewide standard deviation of the EOC Algebra exam scores was 14; of the English II exam scores was 12; of the Biology exam scores was 16; and of the Government scores was 15.

Table A.7. Impact of Kauffman School on 2021-22 MAP and EOC test scores (citywide comparison group)

	Mathematics/ Algebra I	ELA/ English II	Science/ Biology	Government	Sample size
One-year impact estimates (5th grade)	0.24** (0.09)	-0.04 (0.09)	0.16 (0.09)	n/a	597
Two-year impact estimates (6th grade)	0.30** (0.07)	0.14 (0.08)	n/a	n/a	793
Three-year impact estimates (7th grade)	0.56** (0.06)	0.25** (0.06)	n/a	n/a	1,004
Four-year impact estimates (8th grade) ^a	0.34** (0.07)	0.24** (0.07)	0.20** (0.07)	n/a	949
Five-year impact estimates (9th grade)	n/a	n/a	0.14 (0.08)	n/a	590
Six-year impact estimates (10th grade)	0.21** (0.07)	0.13 (0.08)	0.17 (0.09)	n/a	560 ^b
Eight-year impact estimates (12th grade)	n/a	n/a	n/a	0.11 (0.09)	610

Note: This table shows 2021-22 impact estimates in effect-size units. Standard errors are displayed in parentheses below each impact estimate. The sample sizes represent the number of Kauffman and matched comparison students in each analysis.

^a The four-year mathematics impact is based in part on imputed outcome data. See Section C.4 in the appendix for details.

^b The sample size for the six-year impact estimates is equal to the average analytic sample for Algebra I, English II, and Biology. See Table A.3 in the appendix for sample sizes for the analyses of each individual subject.

** Significantly different from zero at the 1 percent level.

n/a = not applicable.

4. Impacts on state test scores by student group

The group impact estimates for the Kauffman School on student achievement in each subject are shown in Table A.8. We estimated group impacts separately on 2020-21 and 2021-22 test scores, then combined the impacts using a weighted average, weighting the impacts by the number of Kauffman students in the analytic samples. The first column represents the differential impact of the Kauffman School on students who had low baseline achievement prior to entering the Kauffman School compared to their relatively higher-achieving peers. The second column represents the differential impact on boys compared to girls. The third and fourth columns represent the differential impact on Hispanic and other race students compared to Black students.

The mathematics impacts represent the average impacts among students in 5th through 8th grade as well as 10th-grade students (Algebra EOC scores); ELA impacts are averaged across 5th- through 8th-grade students as well as 10th-grade students (English II EOC scores); and science impacts are averaged across 5th- and 8th-grade students as well as 9th- and 10th-grade students (Biology EOC scores).

Table A.8. Average differential impact of Kauffman School on 2020-2021 and 2021-22 test scores by student baseline achievement and demographic characteristics (citywide comparison group)

	Low baseline achievement		Male		Hispanic		Other race	
	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size
Mathematics	0.04 (0.05)	808	-0.02 (0.05)	577	0.01 (0.09)	40	-0.13 (0.10)	36
ELA/English II	0.05 (0.05)	877	-0.08 (0.04)	643	-0.03 (0.07)	45	-0.09 (0.14)	39
Science	0.04 (0.07)	458	-0.04 (0.06)	331	0.03 (0.06)	14	-0.16 (0.13)	28

Note: This table shows group impact estimates, averaged across 2020-21 and 2021-22, in effect-size units. Standard errors are displayed in parentheses below each impact estimate. The group sample sizes represent the total number of Kauffman students in the relevant group in each analysis. Cohort-year-level impacts for groups with fewer than 5 students in the analysis were excluded from the average impact. Impacts for groups that included 10 or fewer Kauffman students are excluded from the table.

* Significantly different from zero at the 5 percent level.

** Significantly different from zero at the 1 percent level.

n/a = not applicable.

5. Separate comparison to Kansas City district and charter schools

In Table A.9, we report the test score impacts for two alternative comparison groups. The first half of the table shows the effect-size estimates for the Kauffman School compared to district-operated (non-charter) schools in Kansas City public schools. The second half of Table A.9 presents effect-size estimates for the Kauffman School compared to other charter schools in Kansas City.

Table A.9. Alternative estimates of the impact of Kauffman School on 2021-22 MAP and EOC test scores (district and charter school comparisons)

	Mathematics/ Algebra I	ELA/ English II	Science/ Biology	Government	Sample size
Compared to Kansas City district schools					
One-year impact estimates (5th grade)	0.28** (0.08)	-0.05 (0.08)	0.14 (0.09)	n/a	416
Two-year impact estimates (6th grade)	0.25** (0.08)	0.16* (0.08)	n/a	n/a	543
Three-year impact estimates (7th grade)	0.51** (0.07)	0.25** (0.06)	n/a	n/a	679
Four-year impact estimates (8th grade)	0.42** (0.08)	0.27** (0.08)	0.21** (0.08)	n/a	671
Five-year impact estimates (9th grade)	n/a	n/a	0.17 (0.10)	n/a	351
Six-year impact estimates (10th grade)	0.20 (0.11)	0.23* (0.09)	0.20* (0.10)	n/a	356

	Mathematics/ Algebra I	ELA/ English II	Science/ Biology	Government	Sample size
Eight-year impact estimates (12th grade)	n/a	n/a	n/a	0.15 (0.10)	409
Compared to Kansas City charter schools					
One-year impact estimates (5th grade)	0.14 (0.09)	-0.04 (0.09)	0.17 (0.12)	n/a	304
Two-year impact estimates (6th grade)	0.35** (0.08)	0.13 (0.08)	n/a	n/a	457
Three-year impact estimates (7th grade)	0.55** (0.11)	0.26** (0.08)	n/a	n/a	522
Four-year impact estimates (8th grade)	0.25** (0.09)	0.26** (0.07)	0.12 (0.10)	n/a	444
Five-year impact estimates (9th grade)	n/a	n/a	0.11 (0.09)	n/a	373
Six-year impact estimates (10th grade)	0.19 (0.10)	0.07 (0.09)	0.11 (0.11)	n/a	365
Eight-year impact estimates (12th grade)	n/a	n/a	n/a	0.18 (0.10)	335

Note: This table shows the 2021-22 impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample sizes represent the number of Kauffman and matched comparison students in each analysis.

* Significantly different from zero at the 5 percent level.

** Significantly different from zero at the 1 percent level.

n/a = not applicable.

6. Results as years of learning growth

We can translate the effect sizes presented in the previous sections into an approximate measure of the years of additional learning growth experienced by Kauffman students based on results presented in Bloom et al. (2008).³² Translating the results in this way allows us to evaluate whether the Kauffman School is achieving its goal of producing, on average, at least 1.25 years of learning growth for students during each year of instruction, or 0.25 years of growth beyond what a typical student in another school would achieve.

Converting the impact estimates for the main comparison group yields the results shown in Figure III.1 in the main text. The black horizontal lines show the growth of comparison students, under the assumption that they achieve one year of learning growth each school year. However, the accuracy of these

³² See Gleason et al. (2010), Clark et al. (2013), and Tuttle et al. (2013) for examples of other studies that perform conversions between effect-size estimates and years of learning growth. Using a set of widely administered vertically scaled assessments, Bloom et al. (2008) estimated that the typical 5th-grader grows 0.56 standard deviations in mathematics, 0.40 standard deviations in ELA, 0.40 standard deviations in science, and 0.35 standard deviations in social studies. See Table 3 of Bloom et al. (2008) for typical growth rates in other grade levels. To convert the one-year impact estimates of the Kauffman School into units of years of learning, we divided the impact estimates by the typical growth of 5th-graders in each subject and then added one to represent the annual growth students normally achieve after one year. We used a similar method to convert the two- through six-year impact estimates into years of learning growth. For these results, we divided the impact estimates by the average of the typical growth across all grades included in each analysis and added the number of school years that elapsed since students enrolled in 5th grade.

conversions depends on the extent to which the achievement growth on the MAP and EOC exams is similar to the vertically scaled assessments analyzed in Bloom et al. (2008).³³

E. Additional proficiency rate calculations

In this section, we report on proficiency rates separately for each cohort used in the proficiency rate calculations in Section III.C. When interpreting differences in proficiency rates across cohorts, it is important to note that the Missouri state assessments changed over time. New MAP assessments were administered starting in 2014-15 and changed again in 2015-16. In 2017-18, the state adopted revised Missouri Learning Standards and administered another new MAP assessment, which was administered again in 2018-19 and will be the version administered in future years (Missouri DESE 2017). New Algebra and English II EOC exams were also administered starting in 2017-18, with a new Biology EOC exam starting in 2018-19. Table A.10 shows how the proficiency rates on these assessments for other Kansas City students changed over time, indicating changes in the difficulty levels of these exams.

Table A.10. Proficiency rates on statewide assessments for other Kansas City students

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2020-21	2021-22
ELA								
7th-grade ELA MAP (%)	29	34	36	41	25	27	26	24
8th-grade ELA MAP (%)		35	37	39	33	31	29	27
English II EOC (%)			57	n/a	34	37	36	35
Mathematics								
7th-grade mathematics MAP (%)	29	14	19	23	19	19	14	20
8th-grade mathematics MAP (%)		11	8	7	15	16	5	15
Algebra I EOC (%)			43	n/a	28	24	14	19
Science								
8th-grade science MAP (%)		20	21	23	n/a	28	18	21
Biology EOC (%)			34	33	n/a	11	12	18

Note: Cells with values of "n/a" indicate that proficiency rates were not publicly released, either due to statewide issues with the exams that year or because new exams were being field tested. Statewide assessments were not administered during the 2019-20 school year due to the COVID-19 pandemic.

The proficiency rates of the first seven cohorts (the cohorts that have been enrolled for at least three years) are summarized in the first section of Table A.11.³⁴ The first column shows the percentage of these students who scored proficient or advanced on the MAP exams taken in the spring before they entered the Kauffman School (that is, in 4th grade). This column indicates how ambitious the 75 percent goal is: of incoming students in Cohorts I through VI, only 35 percent had achieved proficient or advanced in mathematics, and 40 percent in ELA, on their prior-year MAP exams. Of incoming students in Cohort VII, 24 percent had achieved proficient or advanced in mathematics, and 22 percent in ELA, on their prior-year

³³ If typical achievement growth on the MAP and EOC exams is less than growth on the assessments analyzed in Bloom et al. (2008), the conversion underestimates the additional years of learning growth Kauffman students achieved, and vice versa.

³⁴ The results from this analysis are based only on data obtained from the Kauffman School, so we did not remove students from the sample because of DESE's data-redaction policy.

MAP exams. Of incoming students in Cohort IX, 27 percent had achieved proficient or advanced in mathematics, and 22 percent in ELA, on their prior-year MAP exams.

The Kauffman School did not meet its goal of 75 percent of students achieving at the proficient or advanced levels after three years of consecutive enrollment. Among students in Cohorts I through VI who were enrolled in the Kauffman School for three consecutive years, 57 percent achieved proficient or advanced on the mathematics MAP exam, and 58 percent scored at that level on the ELA MAP exam—an increase of around 22 and 18 percentage points from their pre-enrollment (4th grade) proficiency after three years, respectively. We based these calculations primarily on students enrolling consecutively in 5th, 6th, and 7th grades, although we also included students who repeated a grade during their first three years.

To further illustrate the progress that Kauffman students made toward the 75 percent goal, we also report the results separately for each cohort. The 2020-21 results for Cohort VIII students mark a significant departure from prior cohorts, with only 23 percent achieving proficient or advanced on the mathematics MAP exam, and 18 percent scoring at that level on the ELA MAP exam. Cohort VIII is the first cohort of Kauffman students for which proficiency rates declined after three years of enrollment. Although proficiency rates among Cohort IX students increased after three years of enrollment, with 33 percent achieving proficient or advanced on the mathematics MAP exam and 25 percent scoring at that level on the ELA MAP exam, they remained lower than those of Cohorts I through VI.

Table A.11. Percentage of Kauffman students scoring proficient or advanced on MAP exams after three years of continuous enrollment

	Proficient/advanced at time of entry	Proficient/advanced after three years of enrollment	Change in proficiency rate after three years	Approximate annual increase in proficiency rate
Cohort I through VI students (7th-graders in 2013-14 through 2018-19)				
Mathematics MAP (%)	35	57	22	7
ELA MAP (%)	40	58	18	6
Both mathematics and ELA MAP (%)	25	46	21	7
Sample size	631	712		
Cohort I students (7th-graders in 2013-14)				
Mathematics MAP (%)	32	69	37	12
ELA MAP (%)	30	55	25	8
Both mathematics and ELA MAP (%)	20	51	31	10
Sample size	74	74		
Cohort II students (7th-graders in 2014-15)				
Mathematics MAP (%)	45	68	23	8
ELA MAP (%)	44	78	34	11
Both mathematics and ELA MAP (%)	32	62	30	10
Sample size	66	78		

	Proficient/advanced at time of entry	Proficient/advanced after three years of enrollment	Change in proficiency rate after three years	Approximate annual increase in proficiency rate
Cohort III students (7th-graders in 2015-16)				
Mathematics MAP (%)	34	58	24	8
ELA MAP (%)	39	63	24	8
Both mathematics and ELA MAP (%)	23	46	23	8
Sample size	134	143		
Cohort IV students (7th-graders in 2016-17)				
Mathematics MAP (%)	35	58	23	8
ELA MAP (%)	37	64	27	9
Both mathematics and ELA MAP (%)	23	49	26	9
Sample size	120	143		
Cohort V students (7th-graders in 2017-18)				
Mathematics MAP (%)	34	42	8	3
ELA MAP (%)	45	50	5	2
Both mathematics and ELA MAP (%)	26	33	7	2
Sample size	117	133		
Cohort VI students (7th-graders in 2018-19)				
Mathematics MAP (%)	30	55	25	8
ELA MAP (%)	44	47	3	1
Both mathematics and ELA MAP (%)	26	43	17	6
Sample size	120	141		
Cohort VIII students (7th-graders in 2020-21)				
Mathematics MAP (%)	24	23	-1	-0.3
ELA MAP (%)	22	18	-4	-1
Both mathematics and ELA MAP (%)	12	12	0	0
Sample size	130	146		
Cohort IX students (7th-graders in 2021-22)				
Mathematics MAP (%)	27	38	11	4
ELA MAP (%)	22	25	4	1
Both mathematics and ELA MAP (%)	16	20	5	2
Sample size	127	153		

Note: The sample includes 839 Cohort I, II, III, IV, V, VI, VIII, and IX students who were enrolled at the Kauffman School for three consecutive years. The scores at time of entry are based on 4th-grade MAP scores for most students and 3rd- or 5th-grade MAP scores for students who skipped or repeated a grade when they joined the Kauffman School. Twelve Cohort II, nine Cohort III, 23 Cohort IV, 16 Cohort V, 21 Cohort VI, 16 Cohort VII, and 26 Cohort IX students are missing baseline MAP exam scores. The scores after three years of enrollment are based on 7th-grade MAP exams for 798 students and 6th-grade MAP exams for 41 students who repeated a grade while at the Kauffman School.

Table A.12 shows the percentage of Kauffman students scoring proficient or advanced in 8th grade after four years of continuous enrollment. The Kauffman School fell short of 75 percent proficiency on each state test for these students in 2021-22, with 35 percent scoring proficient or better in mathematics, 40 percent in ELA, and 26 percent in science. Although these results demonstrate a departure from Cohorts I through V, they are higher than those of students in 8th grade in 2020-21, among whom only 20 percent achieved proficient or advanced in mathematics, 31 percent scored at that level in ELA, and 23 percent in science. Moreover, proficiency rates for Kauffman students in Cohort VIII increased substantially between 7th and 8th grade. When Cohort VIII students were in 7th grade, their mathematics proficiency rate was 23 percent and their ELA proficiency rate was 18 percent.

Table A.12. Percentage of Kauffman students scoring proficient or advanced on MAP exams after four years of continuous enrollment

	Proficient/ advanced at time of entry	Proficient/ advanced after four years of enrollment	Change in proficiency rate after four years	Approximate annual increase in proficiency rate
Cohort I through V students (8th-graders in 2014-15 through 2018-19)				
Mathematics MAP (%)	35	75	40	10
ELA MAP (%)	38	72	34	9
Science MAP (%)	n/a	76	n/a	n/a
All available MAP assessments (%)	23	59	36	9
Sample size	436	484		
Cohort I students (8th-graders in 2014-15)				
Mathematics MAP (%)	32	81	49	12
ELA MAP (%)	27	76	49	12
Science MAP (%)	n/a	78	n/a	n/a
All available MAP assessments (%)	19	66	47	12
Sample size	59	59		
Cohort II students (8th-graders in 2015-16)				
Mathematics MAP (%)	44	86	42	11
ELA MAP (%)	40	81	41	10
Science MAP (%)	n/a	85	n/a	n/a
All available MAP assessments (%)	27	68	41	10
Sample size	52	63		
Cohort III students (8th-graders in 2016-17)				
Mathematics MAP (%)	31	70	39	10
ELA MAP (%)	35	74	39	10
Science MAP (%)	n/a	85	n/a	n/a
All available MAP assessments (%)	19	63	44	11
Sample size	113	120		

	Proficient/ advanced at time of entry	Proficient/ advanced after four years of enrollment	Change in proficiency rate after four years	Approximate annual increase in proficiency rate
Cohort IV students (8th-graders in 2017-18)				
Mathematics MAP (%)	35	73	38	10
ELA MAP (%)	37	65	28	7
Science MAP (%)	n/a	n/a	n/a	n/a
All available MAP assessments (%)	23	55	32	8
Sample size	107	123		
Cohort V students (8th-graders in 2018-19)				
Mathematics MAP (%)	36	75	39	10
ELA MAP (%)	48	69	21	5
Science MAP (%)	n/a	60	n/a	n/a
All available MAP assessments (%)	28	49	21	5
Sample size	105	119		
Cohort VII students (8th-graders in 2020-21)				
Mathematics MAP (%)	18	20	2	0.5
ELA MAP (%)	38	31	-7	-2
Science MAP (%)	n/a	23	n/a	n/a
All available MAP assessments (%)	17	13	-4	-1
Sample size	108	127		
Cohort VIII students (8th-graders in 2021-22)				
Mathematics MAP (%)	23	35	12	3
ELA MAP (%)	23	40	17	4
Science MAP (%)	n/a	26	n/a	n/a
All available MAP assessments (%)	14	18	5	1
Sample size	111	127		

Note: The sample includes 611 Cohort I, II, III, IV, and V, VII, and VIII students who were enrolled at the Kauffman School for four consecutive years. The scores at time of entry are based on 4th-grade MAP scores for most students, and 3rd- or 5th-grade MAP scores for students who skipped or repeated a grade when they joined the Kauffman School. Eleven Cohort II, seven Cohort III, 16 Cohort IV, 14 Cohort V, 19 Cohort VII, and 16 Cohort VIII students are missing baseline MAP exam scores. The scores after four years of enrollment are based on 8th-grade MAP exams for 567 students, and 7th-grade MAP exams for 44 students who repeated a grade during their time at the Kauffman School. These 44 students are included in the calculation of overall proficiency rates in the first row of the table, with results based only on mathematics and ELA scores because 8th-grade science MAP scores were unavailable for them.

n/a = not applicable.

F. Changes in the impacts of the Kauffman School over time

In this section, we report estimates of the Kauffman School’s impact on college enrollment, high school graduation, and achievement separately for each cohort and year. We also test whether the impacts during each year were significantly different from those in the previous year. Table A.13 compares high

school graduation and college enrollment impacts for the first four cohorts of students. The year-to-year changes in the estimated impacts on these outcomes over time are not statistically significant.

Table A.13. Comparison of college enrollment and high school graduation impacts: Cohort I through IV 12th-graders

	Cohort I 12th-graders (2018-19)	Cohort II 12th-graders (2019-20)	Cohort III 12th-graders (2020-21)	Cohort IV 12th-graders (2021-22)
Impact on enrollment in four-year colleges	0.16 (0.07)	0.22 (0.07)	0.14 (0.05)	0.10 (0.05)
Impact on enrollment in any college	0.10 (0.07)	0.26 (0.06)	0.08 (0.06)	0.09 (0.05)
Impact on high school graduation	-0.02 (0.05)	0.05 (0.03)	0.04 (0.04)	0.00 (0.04)
Sample size	514	449	502	568

Note: The results are marginal effects from logit models, in which the outcome variable is an indicator for college enrollment or high school graduation. Standard errors appear in parentheses below each impact estimate. The sample size row shows the average number of Kauffman and matched comparison students in the analysis each year. There were no significant differences in impacts between each cohort and the prior cohort.

Tables A.14 through A.19 show (in effect-size units) the year-by-year impacts presented in Figure IV.1 in the main text.

Table A.14. Comparison of one-year MAP test score impacts: Cohort I through XI 5th-graders

	Cohort I (2011-12)	Cohort II (2012-13)	Cohort III (2013-14)	Cohort IV (2014-15)	Cohort V (2015-16)	Cohort VI (2016-17)	Cohort VII (2017-18)	Cohort VIII (2018-19)	Cohort X (2020-21)	Cohort XI (2021-22)
5th-grade mathematics effect size	0.13 (0.06)	0.15 (0.07)	0.09 (0.06)	0.42** (0.06)	0.80** (0.07)	0.58* (0.07)	0.47 (0.06)	0.42 (0.05)	0.11** (0.07)	0.24 (0.09)
5th-grade ELA effect size	0.06 (0.07)	0.18 (0.06)	0.14 (0.05)	0.44** (0.06)	0.44 (0.05)	0.36 (0.05)	0.16** (0.06)	0.18 (0.05)	-0.37** (0.08)	-0.04** (0.09)
5th-grade science effect size	0.40 (0.07)	0.54 (0.07)	0.40 (0.07)	0.52 (0.07)	0.40 (0.06)	0.52 (0.06)	n/a	0.42 (0.05)	-0.07** (0.07)	0.16* (0.09)
Sample size	677	617	948	714	820	826	899	1,175	897	597

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size represents the total number of Kauffman students and matched comparison students in each analysis. Due to the COVID-19 pandemic, the MAP was canceled in spring 2020. Impacts from 2020-21 are compared to prior scores from 2018-19.

* Significantly different from the prior cohort at the 5 percent level.

** Significantly different from the prior cohort at the 1 percent level.

n/a = not applicable.

Table A.15. Comparison of two-year MAP test score impacts: Cohort I through X 6th-graders

	Cohort I (2012-13)	Cohort II (2013-14)	Cohort III (2014-15)	Cohort IV (2015-16)	Cohort V (2016-17)	Cohort VI (2017-18)	Cohort VII (2018-19)	Cohort IX (2020-21)	Cohort X (2021-22)
6th-grade mathematics effect size	0.33 (0.08)	0.20 (0.07)	0.43* (0.06)	0.48 (0.07)	0.49 (0.07)	0.43 (0.06)	0.49 (0.07)	-0.01** (0.07)	0.30** (0.07)
6th-grade ELA effect size	0.18 (0.07)	0.20 (0.07)	0.17 (0.06)	0.21 (0.06)	0.24 (0.06)	0.24 (0.06)	0.30 (0.06)	-0.06** (0.06)	0.14* (0.08)
Sample size	596	585	1,024	691	851	761	842	942	793

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size represents the total number of Kauffman students and matched comparison students in each analysis. Due to the COVID-19 pandemic, the MAP was canceled in spring 2020. Impacts from 2020-21 are compared to prior scores from 2018-19.

* Significantly different from the prior cohort at the 5 percent level.

** Significantly different from the prior cohort at the 1 percent level.

Table A.16. Comparison of three-year MAP test score impacts: Cohort I through IX 7th-graders

	Cohort I (2013-14)	Cohort II (2014-15)	Cohort III (2015-16)	Cohort IV (2016-17)	Cohort V (2017-18)	Cohort VI (2018-19)	Cohort VIII (2020-21)	Cohort IX (2021-22)
7th-grade mathematics effect size	0.57 (0.07)	0.80* (0.09)	0.56 (0.09)	0.43 (0.07)	0.45 (0.07)	0.55 (0.07)	0.38 (0.06)	0.56 (0.06)
7th-grade ELA effect size	0.41 (0.08)	0.66* (0.09)	0.26** (0.07)	0.18 (0.07)	0.31 (0.06)	0.26 (0.07)	0.02* (0.06)	0.25** (0.06)
Sample size	534	580	590	700	771	798	877	1,004

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size represents the total number of Kauffman students and matched comparison students in each analysis. Due to the COVID-19 pandemic, the MAP was canceled in spring 2020. Impacts from 2020-21 are compared to prior scores from 2018-19.

* Significantly different from the prior cohort at the 5 percent level.

** Significantly different from the prior cohort at the 1 percent level.

Table A.17. Comparison of four-year MAP test score impacts: Cohort I through VIII 8th-graders

	Cohort I (2014-15)	Cohort II (2015-16)	Cohort III (2016-17)	Cohort IV (2017-18)	Cohort V (2018-19)	Cohort VII (2020-21)	Cohort VIII (2021-22)
8th-grade mathematics effect size	0.96 (0.10)	0.97 (0.15)	0.84 (0.11)	0.71 (0.10)	0.90 (0.11)	0.11** (0.08)	0.34* (0.07)
8th-grade ELA effect size	0.53 (0.08)	0.39 (0.10)	0.27 (0.08)	0.23 (0.07)	0.43 (0.08)	0.14** (0.07)	0.24 (0.07)
8th-grade science effect size	0.66 (0.10)	0.61 (0.11)	0.74 (0.10)	n/a	0.45* (0.09)	0.16* (0.07)	0.20 (0.07)
Sample size	748	459	608	690	727	732	949

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size represents the total number of Kauffman students and matched comparison students in each analysis.

* Significantly different from the prior cohort at the 5 percent level.

** Significantly different from the prior cohort at the 1 percent level.

n/a = not applicable

Table A.18. Comparison of EOC test score impacts: Cohort I through VII 9th-graders

	Cohort I (2015–16)	Cohort II (2016–17)	Cohort III (2017–18)	Cohort IV (2018–19)	Cohort VI (2020–21)	Cohort VII (2021–22)
9th-grade Algebra I effect size	0.94 (0.15)	0.73 (0.14)	0.37* (0.09)	0.50 (0.09)	n/a	n/a
9th-grade English II effect size	n/a	0.51 (0.10)	0.25* (0.08)	n/a	n/a	n/a
9th-grade Biology effect size	1.25 (0.13)	0.86* (0.12)	n/a	0.77 (0.08)	n/a	0.14** (0.08)
Sample size	315	454	488	573		

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size row shows the average number of Kauffman and matched comparison students in the available EOC analyses each year.

* Significantly different from the prior cohort at the 5 percent level.

** Significantly different from the prior cohort at the 1 percent level.

n/a = not applicable.

Table A.19. Comparison of EOC test score impacts: Cohort I through VI 10th-graders

	Cohort I (2016–17)	Cohort V (2020–21)	Cohort VI (2021–22)
10th-grade Algebra I effect size	n/a	n/a	0.21 (0.07)
10th-grade English II effect size	0.60 (0.11)	0.09** (0.08)	0.13 (0.08)
10th-grade Biology effect size	n/a	n/a	0.17 (0.09)
Sample size	435	613	617

Note: The table shows impact estimates in effect-size units. Standard errors appear in parentheses below each impact estimate. The sample size row shows the average number of Kauffman and matched comparison students in the available EOC analyses each year.

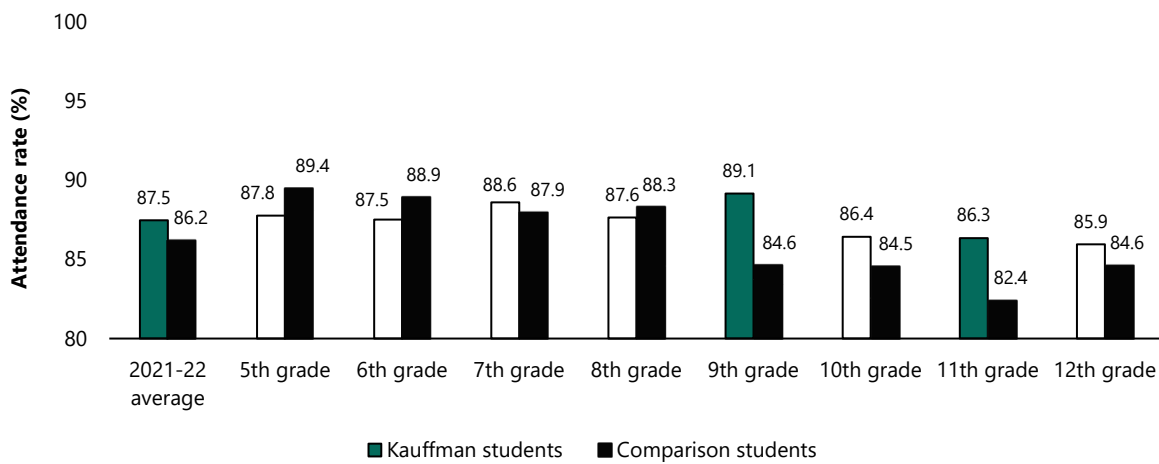
** Significantly different from the prior cohort at the 1 percent level.

n/a = not applicable

G. Grade-level and group-specific attendance and suspension impacts

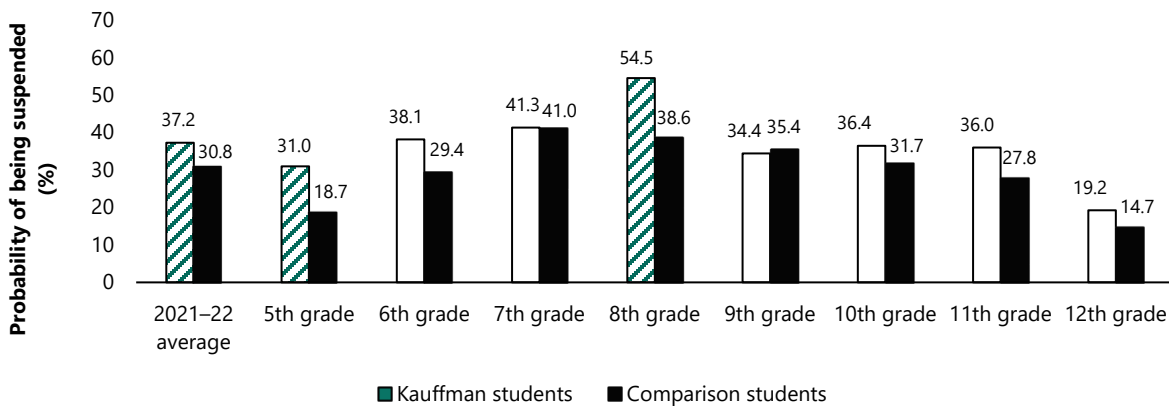
Figure A.1 shows the 2021-22 attendance impacts separately for each grade level. Figures A.2 through A.4 show separate grade-level impacts for overall, in-school, and out-of-school suspensions. Caution should be used when drawing conclusions based on the statistical significance of grade-level comparisons. More than 20 comparisons are being made, so at least one would be expected to show statistical significance due to random chance.

Figure A.1. The Kauffman School had a positive impact on student attendance overall during 2021-22, an impact largely driven by higher attendance rates for Kauffman students in high school grades



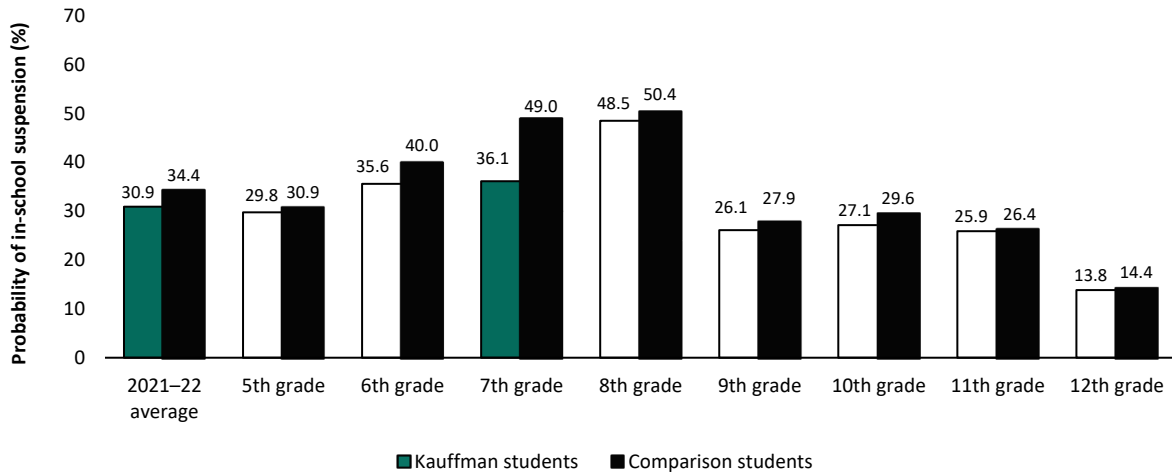
Note: The solid green bars indicate that the impact of the Kauffman School is statistically significant at the 0.05 level.

Figure A.2. Kauffman students had higher overall suspension rates than comparison students during 2021-22; suspension rates for Kauffman students were higher for all grade levels except 9th grade



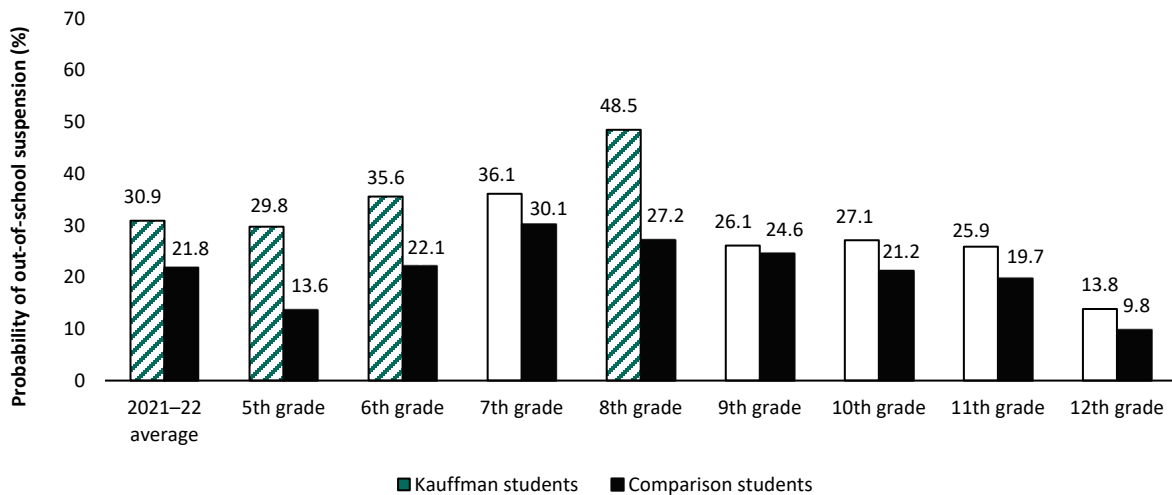
Note: Dashed green bars indicate that Kauffman students had significantly higher suspension rates than comparison students (p-value < 0.05).

Figure A.3. Kauffman students had significantly lower rates of in-school suspensions than comparison students during 2021-22; in-school suspension rates for Kauffman students were lower in all grades



Note: Solid green bars indicate that Kauffman students had significantly lower in-school suspension rates than comparison students (p-value < 0.05).

Figure A.4. Kauffman students had significantly higher rates of out-of-school suspensions than comparison students during 2021-22; out-of-school suspension rates for Kauffman students were higher for all grade levels



Note: Dashed green bars indicate that Kauffman students had significantly higher out-of-school suspension rates than comparison students (p-value < 0.05).

Table A.20 shows the yearly impacts of the Kauffman School on attendance and overall suspensions, as well as separately for in-school and out-of-school suspensions. Between 2019-20 and 2021-22, the differences in estimated impacts on overall suspension rates and out-of-school suspensions rates

significantly increased. There were no statistically significant differences in the estimated impacts on attendance rates and in-school suspensions between 2019-20 and 2021-22.

Table A.20. Comparison of impacts of the Kauffman School on attendance and suspensions across years

	2011–12 average	2012–13 average	2013–14 average	2014–15 average	2015–16 average	2016–17 average	2017–18 average	2018–19 average	2019–20 average	2021–22 average
Attendance rate (%)	-0.83 (0.48)	0.87** (0.31)	0.72 (0.27)	0.87 (0.23)	0.96 (0.22)	1.06 (0.25)	0.48 (0.27)	1.36* (0.27)	1.41 (0.28)	1.28 (0.42)
Probability of being suspended (%)	13.4 (5.2)	7.22 (3.5)	24.7** (2.6)	8.85** (2.4)	1.72* (2.4)	-3.20 (2.1)	-3.64 (1.9)	-5.25 (1.7)	-7.66 (1.46)	6.40** (1.64)
Probability of in-school suspension (%)	0.27 (3.9)	-1.27 (2.2)	24.8** (2.6)	10.5** (2.1)	-1.29** (2.1)	1.39 (2.0)	-10.1** (1.6)	-5.88 (1.5)	-4.84 (1.30)	-3.45 (1.36)
Probability of out-of-school suspension (%)	14.2 (4.7)	8.97 (3.4)	16.6 (2.8)	4.51** (2.3)	2.79 (2.2)	-4.29* (1.8)	4.95** (1.7)	-1.35** (1.5)	-4.91 (1.30)	9.07** (1.53)
Sample size	677	1,213	2,067	3,066	3,156	4,064	4,877	5,923	6,651	10,531

Note: The suspension results are marginal effects from logit models in which the outcome variable is an indicator for receiving a suspension during the year. Standard errors appear in parentheses below each impact estimate. The sample size represents the total number of Kauffman students and matched comparison students in each analysis.

* Significantly different from the prior school year’s outcomes at the 5 percent level.

** Significantly different from the prior school year’s outcomes at the 1 percent level.

Table A.21 shows the group-specific impact estimates for the Kauffman School on student attendance and suspensions. With the exception of differing attendance rates for students with low versus higher baseline achievement, the Kauffman School had similar impacts on attendance and suspension for the student groups we examined.

Table A.21. Average differential impact of Kauffman School on 2021-22 attendance and suspension rates by student baseline achievement and demographic characteristics (citywide comparison group)

	Low baseline achievement		Male		Hispanic		Other race	
	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size
Attendance rate (%)	2.78** (0.88)	654	1.45 (0.86)	488	-1.09 (1.97)	31	-2.29 (1.77)	26
Probability of being suspended (%)	-0.12 (3.66)	653	0.46 (3.36)	488	-6.37 (4.94)	12	5.67 (11.9)	26
Probability of in-school suspension (%)	6.31 (3.44)	648	0.84 (2.85)	482	n/a	n/a	5.61 (5.09)	11

	Low baseline achievement		Male		Hispanic		Other race	
	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size	Impact	Group sample size
Probability of out-of-school suspension (%)	-0.23 (3.51)	652	-0.79 (3.12)	487	n/a	n/a	14.8 (13.3)	25

Note: This table shows group impact estimates, averaged across 2020-21 and 2021-22, in percentage point units. Standard errors are displayed in parentheses below each impact estimate. Cohort-year-level impacts for groups with fewer than five students in the analysis were excluded from the average impact. Impacts for groups that included 10 or fewer Kauffman students are excluded from the table. Sample sizes for some student groups are lower in the suspension results than in the attendance results. This is because some students are dropped from the logit model due to covariates perfectly predicting the outcome.

** Significantly different from zero at the 1 percent level.

n/a = not applicable.

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